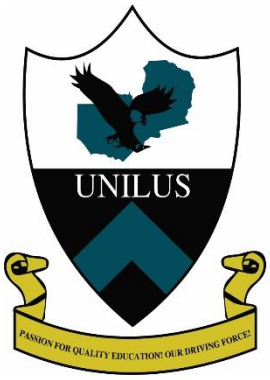

UNIVERSITY OF LUSAKA

SCHOOL OF POSTGRADUATE STUDIES

Examining the Impact of droughts on women farmers and identifying potential adaptation strategies adopted by women farmers in Zimba District.

A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, UNIVERSITY OF LUSAKA, IN PARTIAL FULFILMENT OF THE AWARD OF THE MASTER OF ARTS IN DEVELOPMENT STUDIES.

BY

EVAS KACHEPA

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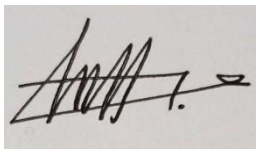
DECLARATION

I E K do hereby declare that this is my original work and that no one has ever presented it at any university or institution before.

Signature: Date: 30th December 2024

Supervisors Signature:  Date: 19th January 2025

DEDICATION

This thesis is lovingly dedicated to my parents, Mr. and Mrs. Kachepa, whose boundless love, steadfast encouragement, and unwavering belief in me have been the bedrock of my strength and determination.

To my sister, Purity Kachepa, and her husband, Mr. Banda, for their relentless support, both emotionally and financially, and for always cheering me on with unshakable enthusiasm.

To my dearest friend, Shebba Shibwela, whose faith in me never wavered and whose constant encouragement lit my path through the challenges of this journey.

Above all, this work is dedicated to all those who dare to overcome adversity, demonstrating that with perseverance, dedication, and hope, transformative change is possible.

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This achievement is a testament to the collective support and encouragement I have been blessed with, and I remain forever grateful.

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LIST OF ACRONYMS

FAO – Food and Agriculture Organization

IPCC – Intergovernmental Panel on Climate Change

GAD – Gender and Development

SES – Socio-Economic Status

NGO – Non-Governmental Organization

FGD – Focus Group Discussion

UNCCD – United Nations Convention to Combat Desertification

PRA – Participatory Rural Appraisal

ABSTRACT

Droughts have posed a grave challenge to Zambian rural women farmers, particularly in Zimba District, where household livelihoods rely primarily on farming. The study examines the impact of frequent droughts on women farmers, identifying the changes in agricultural practice, socio-economic impacts, and the effectiveness of adaptation measures. The study employs a qualitative research design, where semi-structured interviews, focus group discussions (FGDs), and key informant interviews were employed in gathering data from women farmers, agricultural extension officers, and community leaders. Thematic analysis was employed in identifying patterns and trends in the data.

Results show that women farmers have responded to droughts by shifting to drought-tolerant crops, and modifying planting times. These coping mechanisms are, nevertheless, constrained by poor access to financial services, agricultural inputs, and extension services. Socio-economically, droughts reduced household incomes, food insecurity, and women's workload, as they search for water, food, and alternative livelihood options. Additionally, the disintegration of the traditional social support networks has forced women to rely more on informal cooperatives for resource sharing and building resilience.

The study illustrates the need for targeted policy responses, including greater access to drought-tolerant seeds, microfinance options, and farmer field schools for women farmers. Cooperative consolidation, rural infrastructure development, and gender-sensitive climate policy mainstreaming at the national level are critical for long-term resilience. The study contributes to ongoing discussions on gender, climate adaptation, and rural development with policy and programmatic implications for responding to the effects of climate change on vulnerable farming communities.

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

Like most parts of the country, Zimba District has been facing droughts as well. Agriculture, being the main activity of the local economy, is largely practiced by women farmers. The women not only support their families but also greatly contribute to the socio-economic fabric of their communities. Therefore, understanding the implications of droughts on women famer's, socio-economic status is imperative.

An increase in the frequency and severity of drought has brought dramatic changes in these practices. Women, who represent the larger proportion of the agricultural labor force, are no exception. They carry the double burden of safeguarding food security for their households and running economic activities under difficult conditions, which eventually results in a shift of crop production, adoption of water-saving methods, and/or changes in farming calendars, (Chama, 2018).

The repeated droughts also play their part in shaping the community dynamics in rural areas such as Zimba. Families and communities fighting for scarce resources, transmit the pressures exerted onto the social structures and support networks. The traditional communal capacities for sharing labor and exchanging mutual assistance gain increasing importance under conditions of environmental stress. These practices are also, however, threatened under drought that forces people to shift attention to the family at the expense of communal duties. The shift can create social destruction, which leads to a weakening of community resilience, (Mwanza and Banda, 2021).

In reaction to these challenges, women farmers in Zimba have come up with a number of adaptation strategies. These include diversifying sources of livelihood, small-scale irrigation schemes, and setting up cooperatives through which farmers pool resources

and expertise. Strategies such as these are keys to building resilience against droughts. Moreover, training and microfinance for women, which started to improve their agricultural productivity and general economic stability, took root, (Mwanza and Banda, 2021).

These are adaptation strategies that give a feel of how resilient rural communities are, most of which have been facing these adversities of climatic change. The implication this carries in importance for women farmers is targeted interventions aimed at increasing their capacity to be resilient. This study has targeted to understand in full context the impacts of these droughts on women's agricultural practices in Zimba District. It also seeks to identify and analyze how effective the adaptive strategies adopted by these women are, with a view to recommending policies and practices likely to promote sustainable agricultural development in the region.

1.1.1 Background of the Study

Droughts are a frequent issue in the majority of sub-Saharan Africa regions, with severe effects on rural societies whose means of livelihood are based on agriculture. Zambia, particularly the southern provinces, has been experiencing increasing drought occurrences over the years with significant socio-economic effects. Zimba District in the semi-arid Southern Province of Zambia is particularly at risk since it primarily subsists on rain-fed farming (Central Statistical Office of Zambia, 2012). Increased frequency and severity of droughts have resulted in crop failure, food insecurity, and decreased household incomes, with a disproportionate impact on women farmers who make up the majority of the region's agricultural workforce (FAO, 2011).

Zambian rural women have a double role as producers of food and caregivers and are therefore highly susceptible to environmental stresses such as droughts (Tembo & Sitko, 2020). Despite their key role in agriculture, women face structural challenges like lower access to credit, agricultural inputs, and land, further constraining their capacity to adapt climate-resilient agricultural practices (UN Women, 2018). Drought exacerbates the problem by adding more labour burdens on women since they have to make long-distance trips to obtain water and source food for the household (Sorenson et al., 2011). Moreover, the unpredictability of rainfall has led farmers to not succeed in planning their

agricultural work in relation, which also jeopardized household food security (Harris, 2014).

Female farmers in Zimba District have adopted a number of adaptation strategies to reduce the effects of drought, including switching to drought-resistant crops, shifting planting calendars, and engaging in small-scale income-generating activities like livestock rearing and petty trade (Gannon et al., 2021). Community coping mechanisms, such as women's cooperatives, have also played an important role in the aggregation of resources, knowledge sharing, and accessing external support (Meinzen-Dick et al., 2014). However, the effectiveness of such adaptation reactions remains hampered by economic constraints, inadequate access to extension services, and insufficient institutional support (Tsegaye et al., 2014).

While previous studies have looked at the overall impact of climate change on farming, few studies have assessed the gendered vulnerabilities and adaptation strategies of women farmers. This study attempts to address this knowledge gap by analyzing the impact of droughts on women's farming activities in Zimba District and assessing how effective their adaptation strategies are. The research will support the formulation of targeted interventions and policies to help strengthen the climate variability resilience of women farmers.

1.2 Statement of the Problem

Agriculture still remains the primary source of livelihood for the majority of Zambia's rural communities, with women playing a major role in food production and household sustenance. However, the increasing frequency of droughts in districts like Zimba District has significantly disrupted agricultural productivity, exacerbating food insecurity and economic uncertainty (FAO, 2011). Female farmers, being already structurally vulnerable with minimal access to land, credit, and farm inputs, are most vulnerable to the adverse effects of climate variability (Tembo & Sitko, 2020). Although resilient, their adaptation efforts remain primarily informal, poorly supported, and insufficient in mitigating long-term drought effects (Gannon et al., 2021).

Previous studies have established the negative impacts of droughts on crop production and household well-being (Harris, 2014; Sorenson et al., 2011). There is still a lack of knowledge regarding how exactly women farmers in Zimba District understand and adapt to the issues. Existing studies lack a close look at gendered dimensions of drought resilience, in particular, how economic and social constraints limit women's ability to adopt sustainable adaptation strategies. Besides, despite research that has pinpointed adaptation measures like diversification of crops and small-scale irrigation (Tsegaye et al., 2014), there is limited evidence regarding their long-term effectiveness and the influence of institutions in enhancing resilience.

Overlooking these knowledge gaps has high-stakes ramifications. If the women farmers continue to bar access to climate-resilient farm technology, finance, and institutional service, their vulnerability to recurring drought will further deepen consolidating poverty, hunger, and economic exclusion of the Zimba District. Secondly, breakdown of traditional support mechanisms due to resources depletion threatens cohesion and building communal collective resilience practices.

1.3 Research Objectives

The overall objective of this study is to assess the impact of droughts on women's farming activities, in the rural Zimba District. The specific objectives for this study are:

1) To examine how women farmers have changed their farming practices because of the droughts.

2) To analyze the socio-economic impact of droughts on women farmers.

3) To assess the effects of droughts on communities and social structures concerning women in Zimba District.

4) To evaluate the effectiveness of the strategies adopted by women farmers.

1.4 Research Question

1. How have women farmers in Zimba District changed their farming practices because of the droughts?

2. What are the socio-economic impacts of droughts on women farmers'?
3. To what is the affect you communities and social structures concerning women in Zimba District?
4. How effective are the strategies adopted by women farmers?

1.5 Significance of the study

The aim of this study was to provide a whole insight concerning the many-sided influence on agricultural practices, socio-economic status, as well as community dynamic changes among women in Zimba District, Southern Province. In light of increased frequency and severity of drought due to climate change, this paperdiscoursed a gap in knowledge about how natural environmental shocks affect, in particular, one of the most vulnerable segments of the population, which is women farmers within rural communities.

1.5.1 Effect on Farming Practice

Understanding the specific changes in farming practices due to droughts is important in tailoring effective support mechanisms for women farmers. This study displayed adjustments that women farmers make in farming techniques, crop choices, and resource management in order to cope with the drought conditions. There is, therefore, a need to document information on how such agricultural extension services and development programs may promote sustainable and resilient farming, (Nkonde and et al., 2019).

1.5.2 Socio-Economic Implications

The socio-economic status of women farmers is as good as their agricultural productivity. The piece will offer good information on the economic challenge women face due to instances of drought in the form of reduced incomes, food insecurity, and browbeating poverty with very minimal access to resources. By highlighting these issues, the research guides the policymakers in designing relevant intervention approaches that would support the economic empowerment of women for improved livelihoods, as attested to by (Tembo and Sitko, 2020).

This has not only affected the individual but also has general implications for community and its social structures. The paper intended to establish whether drought-induced resource scarcity affects social cohesion, mutual assistance, and community resilience. These dynamics are very instrumental in building social support systems and community solidarity in view of environmental adversity and uncertainties, (Chama, 2018).

1.5.3 Adaptation Strategies

This research adds to this discourse by identifying adaptive strategies of women farmers to the drought physiological effects. Indeed, through this recording, the study has depicted practical examples of the resilience and resourcefulness of women farmers in their livelihood, which should be replicated and scaled up in other areas often challenged by instances of drought. Consistent with this, is the fact that knowledge also enables development practitioners to design programs that are aimed at enhancing the capacity of women farmers to adapt to climate variability.

1.5.4 Policy Implications

This study's results contribute to guiding policy at the national and local levels interested in attaining sustainable agricultural development, improved socioeconomic conditions, and strengthened community resilience. It therefore offers policymakers an opportunity to optimize resource allocation through the improved targeting of interventions and the design and implementation of programs that are sensitive to the needs of men and women, while promoting equal access to agricultural inputs and financial services.

1.5.5 Contribution to Academic Literature

It therefore adds to the growing body of knowledge on climate change, gender, and agriculture. It provides information regarding how the Zimba District study contributes to understanding local conditions and cultural factors that affect both the impact of environmental stressors and the effectiveness of strategies of adaptation. Therefore, the results obtained can serve as a great reference for the development of future research on related topics in other regions.

1.6 Scope of Study

The research focused on the effect of droughts on the socio-economic status of women in Zimba. This study provided deep insights into how such environmental stressors are affecting these women farmers and aims to establish the adaptation strategies that women farmers have or can use to mitigate these challenges.

The study was confined to Mbwiko and Chalimongela Wards of Zimba District in Southern Province. The area was chosen for this study due to its propensity to suffer from droughts and high agricultural dependence as the principal productive activity among its people, with women farmers being the focus. The research was bound to generate location-based information useful in designing interventions responsive to context-specific challenges in one district in Zambia. According to Chama (2018) the information shall be very important for designing appropriate responses to context-specific challenges.

Key respondents for this research were women farmers living in rural communities within Zimba District. This will included small-scale subsistence farmers and those involved in commercial farming, hence a highly heterogeneous demographic group. Their views and experiences will be important in understanding differential drought impacts on different segments of the female farming population and in the identification of effective adaptation strategies, (Tembo and Sitko, 2020).

7. Definition of key terms and concepts

1.7.1 Recurring Droughts

Recurring droughts are periods of below average precipitation recurring over time. These droughts cause acute shortages in water supplies, which negatively affect the agriculture, ecosystems, and human consumptions IPCC (2014).

1.7.2 Women’s Agricultural Practices

Women's agricultural practices are methods and practices by women farmers during cultivation and rearing of animals. They refer to practices of planting, irrigation, pest control, harvesting, and postharvest handling, all normally guided by local knowledge,

cultural tradition, and resources at their disposal. Socio-Economic Status resources (FAO, 2011).

1.7.3 Socio Economic Status

Socioeconomic status measures the relative position of individuals or groups vis-à-vis others in society according to their composite characteristics of income, education, and occupation. It expresses their relative positions in contrast with others within the economic and social structure. SES has a bearing on access to resources, health outcomes, and general quality of life, (FAO, 2011).

1.7.4 Community dynamics

Community dynamics refer to the way a community relates and organizes itself in acting upon its priorities. They are influenced by social, economic, and cultural factors and may determine the level of resilience and capacity at which a community can respond to various challenges, (Laverack, 2006).

1.7.5 Adaptation Strategies

Some of the adaptation strategies include adjustment to the new conditions, reducing vulnerability, and building resilience to the climatic changes like drought. Other agriculture adaptation strategies include crop diversification, planting drought-resistant varieties, water conservation, planting schedule adjustments, among others, (IPCC, 2014).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Droughts have been one of the critical concerns that many rural communities experience across the globe, with sub-Saharan Africa also ranking high on the list. Drought interferes with water supply, lowers agricultural production, and causes food insecurity. Agriculture forms the mainstay of livelihoods in this region, and climatic challenges thus have deep and multi-dimensional impacts. The consequences are much deeper than the mere economic losses experienced directly; the effects include changes in the dynamics of a community, social structures, increasing vulnerabilities, and stressing of adaptive capacities.

Women constitute the center of agricultural production in rural Zambia, often bearing the responsibility of farming activities. FAO (2011), pointed out that though women farmers play a vital role, they are constrained by gender disparities in access to resources, land ownership, and decision-making powers. Attention is mainly on how these droughts have impacted women's agriculture practices in rural Zambia, specifically Zimba District in Southern Province. This is a focus that not only underlines the dimensioning of gender in climate change but also calls for an understanding of how to build resilience through local strategies of adaptation, (Lamboll and et al., 2018).

This literature review is guided by the following question: How does drought affect women farmers socio-economic status, in Zimba District? It also identifies probable strategies adapted by women farmers. Intended to provide an understanding of the complex relationship between environmental stressors and socio-economic factors, this review integrates theoretical frameworks of gender, vulnerability, and adaptation to climate change, (Lamboll and et al., 2018).

2.2 Empirical Review

2.2.1Impacts of Drought on Agriculture

Many studies have pointed out the fact that the gendered nature of agricultural roles contributes to the vulnerability of women to the effects of drought. Women play the major role in agriculture in Zambia but face chronic inequalities in access to resources such as land, water, and credit. Tembo and Sitko (2020) used a mixed-methods approach, combining household surveys and focus group discussions, in an attempt to understand such gendered inequalities and the consequences thereof on agricultural productivity during drought periods.

The constraints imposed by limited access to land and other agricultural inputs hampered women's capacity to respond appropriately to climate stressors. These were some of the constraints that made women farmers unable to adopt modern agricultural technologies and more vulnerable to drought effects. Although this study provides valuable insights on gender disparities, it has not really explored how local institutions contribute to women's resilience.

Drought conditions in agriculture affect women by increasing gender disparities and adding to the socioeconomic burdens on female farmers. It is women who provide the main labor force in agriculture, particularly in the rural areas, and it is they who must confront directly the outcomes of crop yield reduction, lack of water, and productive loss in livestock. On top of that, their inability to access crucial variables such as land ownership, credit, and agricultural technologies limits their avenues in overcoming drought-associated issues. This not only lowers their agricultural production but also reduces the household food security, income, and general well-being. Since women are normally in charge of managing households and finding food for the family, they suffer extra during drought conditions and their families do too, (Adapted from UNCCD, 2022).

The droughts also increase physical and emotional stress for women, as they have to walk longer distances to fetch water and find food; these cause fatigue and leave them with less time available for productive farming. Despite crop failure and loss of livelihood, women have shown resilience through different adaptation strategies, including income

diversification and cooperation in food security enhancement. Most of these strategies have often fallen short of success due to lack of institutional and policy support which caters to women's needs. Addressing the gendered effects of drought requires recognition of women's pivotal role in agriculture, including policies that accord them equal access to resources and can enable them to act as agents of change in climate resilience, (Adapted from UNCCD, 2022).

2.2.2. Social and Economic Impacts of Droughts

Droughts have broad social and economic effects, particularly in rural areas where agriculture is a significant contributor to household livelihoods. Drought episodes severely undermine food security, which can be linked to rising rates of malnutrition sustained by the most vulnerable members in society, such as children and the elderly, according to Schmidhuber and Tubiello (2007). Generation of income is also impacted because crop failures and livestock loss reduce family incomes, driving them into poverty, as advanced by (Dercon, 2004).

Droughts are usually associated with increased workload, mainly to women, who are generally responsible for obtaining water and food for their families. Increased labor demands from searching for scarce resources exacerbate already large labor demands. Additional labor burden in finding scarce resources exacerbates their already significant labor demands Pandey and et al (2015). Another consequence is migration, either of individuals or the whole households in search of better living conditions, leading to social disruptions and consequently possible conflicts in the receiving areas Black and et al (2011). Social conflicts can also arise within communities around how dwindling resources are used and distributed, ultimately threatening social cohesion.

Droughts most often widen the gap between men and women in terms of access to resources and decision-making power. Usually, women have less access to land, credit, and farm inputs, which reduce their capacities to respond effectively to the environmental stressors; UN Women (2018). In Zambia, for example, while women constitute the majority of the agricultural workforce, a number of factors adversely affect their productivity and resilience to climate change, (Zambia Ministry of Gender, 2015).

2.2.3. Women Farmers and Droughts: A Focus on Women Farmers and Specific Vulnerabilities that they are facing

Women farmers are mostly constrained by problems of land ownership and access to primary inputs like water, credit, and technology. Customs and norms in many rural areas restrict women's rights to land inheritance or ownership, thus limiting their ability to secure the collateral normally required to obtain credit. Of equal concern, access to water sources may be restricted: women generally rely on communal water sources, which could become unreliable or even distant, especially during periods of drought. Moreover, the low access to agricultural technology and extension services still remains a driver of their ability lower in adopting effective farming practices and quickly responding to environmental shocks, (World Bank, 2015).

Labour burden for women increases during droughts. In most cases, this requirement makes women, who are usually primary caregivers and household water managers, travel longer distances for water collection, using valuable time and energy that might have been directed toward agricultural activities or alternative income-generating activities, as discussed in Sorenson and et al. (2011). Increased workload of this kind usually leads to physical exhaustion and thus lowers overall productivity for their agricultural effort. Moreover, the responsibility of searching for food for the family in scarce periods increases the stress levels of women, making them further susceptible, (Harris, 2014).

The power in decision-making within the house and the society is another area where women are thought to be inferior. In most rural societies, decisions taken at the house level, such as different resources and farming methods, are entirely left to men, (Meinzen-Dick and et al., 2014). Thus, this may hinder them to adopt some adaptive strategies relevant for their farming and household needs. Moreover, women are mostly excluded in the community-level decision-making processes, which reduces their participation in developing and implementing the local adaptation plans.

2.2.4 Role of Women in Adaptation Strategies

Despite all this negativism in the role of women in adaptations, women have relevant valuable knowledge and skills in developing effective adaptation strategies. Their daily management of resources such as water, food, and fuel offers them a unique understanding of environmental changes and the practical measures that can be taken to mitigate their impacts. Additionally, women's participation in community networks and informal support systems enhances their potential for information sharing and supplying of resources for collective action in drought response, (Speranza and et al., 2010).

2.2.5 Coping Mechanisms and Adaptation Strategies by Women

A case study by Gannon et al. (2021) factored in how women farmers in Kenya create adaptation strategies at the community level by conserving water, diversifying livelihoods, and establishing women's cooperatives. In this study, using PRA techniques through FGDs and participatory workshops, adaptation strategies that involve the participation of women were mapped out. The collective strategies to enhance resilience among women in the study included rainwater harvesting and cooperation in resource pooling. Most of these strategies were able not only to survive during the drought period but also empowered them socioeconomically. This study focused on communal adaptation but did not consider the household level decision-making process, particularly the intra-household dynamics affecting the capacity of women to adapt.

Adaptation strategies by women are a very important component of resilience to climate variability. A study conducted by Tsegaye et al. (2014) in Ethiopia showed that women were key players in diversification strategies, including small-scale trading and handicrafts, as well as livestock rearing, as a means of coping with drought. Longitudinal survey method applied here tracked the changes in the livelihoods of women over five years of droughts. The key findings showed that non-agricultural activities were one of the most significant avenues that women used to diversify their sources of income; these provided a financial cushion against drought. Gap: This study investigated neither the means through which these adaptation strategies would function in respect of local

governance structures and external support availability, nor the institutional environment that could enhance or constrain the women's adaptation efforts.

2.2.6 Drought in Southern Province of Zambia

Zimba District is one of the districts in the Southern Province of Zambia. It is a rural district with an overwhelmingly agricultural economy; most of the population is into subsistence farming. Zimba lies in a semi-arid geographical area, and because of this, it is very vulnerable to climatic variability and water scarcity, (Central Statistical Office of Zambia 2012).

Socio-economically, there are several challenges that include high poverty rates, limited access to healthcare and education and underdeveloped infrastructure. Its economy is highly depended on agriculture, with maize, sorghum, and millet being the principal crops grown in the district. Livestock farming also makes a significant contribution to the household livelihoods through the rearing of cattle, goats, and poultry, (FAO, 2017).

The Southern Province of Zambia, including Zimba District, is plagued by recurring droughts, which significantly affect agricultural production and socio-economic stability. Droughts in this region are characterized by the frequency, duration, and severity of the events, which often may lead to prolonged periods of water scarcity and crop failure. Without considering variability and the effect that changing climatic regimes might have on it, drought frequencies in Zimba have increased over the past decades. These droughts usually take a very long period of months, affecting the growing and harvesting seasons. The spells usually are so severe in Zimba that they cause reduced crop yields, destruction of livestock, and deterioration in the water sources, (Ngoma and et al., 2014). An example is the two spells, 2015-2016 and 2018-2019, which were particularly harsh, contributing significantly to rampant food insecurity and reappraisals of hardships for many households in the country, (Zambia Meteorological Department, 2019).

2.2.7 Impacts of the Droughts in Southern Province

The consecutive droughts have impacts that are varyingly manifested in aspects of life in the district of Zimba. Agronomically, a drought has low soil moisture and increased soil

degradation, hence reducing crop productivity. In regard to that, therefore, food insecurity and malnutrition amongst the rural population are heightened, as indicated by (Mubanga and Umar, 2018).

Socio-economically, the effects of drought extend beyond agriculture. Water shortage affects women and children adversely since they are usually the ones that fetch water. This additional workload lowers the time that can be devoted to any other productive activity, including farming and education, (Gannon and et al., 2021). Economically, droughts cause an overall reduction in the level of household income and an increase in the level of poverty since crop and livestock losses translate directly to financial loss (Jain, 2007).

2.2.8 Existing Research on Droughts in Southern Province

Available literature indicates that Zimba District is prone to drought and perceives the consequences on farming practices and socio-economic status. Mubanga and Umar (2018) review the impact of drought on rural livelihoods within the Southern Province with emphasis on effective adaptation measures. The study identified that adaptation measures including the adoption of drought-tolerant crops and better water management strategies would significantly alleviate the adverse impacts of droughts.

Ngoma and et al. (2014) have gone a step further to research rural households coping with droughts. Diversification of income sources, migration into towns, or reliance on social networks are all coping mechanisms. However, these strategies were mostly curtailed by low socio-economic conditions and lack of access to resources.

2.2.9 Potential Adaptation Strategies

Various strategies adopted by women farmers in adapting to the droughts in Zimba District focused on agricultural and socio-economic measures. Under agricultural practices, these women had largely shifted to drought-tolerant crops like sorghum, millet, and cassava, which are said to require less water and are highly resilient to any drought conditions. In addition, mulching, reduced tillage, and rainwater harvesting are among the water-saving practices that have been adopted to use available water wisely. The other

key strategies that were applied included diversification of income sources; many women tried their luck in livestock farming, small-scale businesses, and other off-farm activities to reduce over-reliance on crop yields. Moreover, sharing knowledge and collective action at community levels have been successful as women organize cooperatives and community groups to share information on best practice and help one another during difficult times, (Gannon and et al., 2021).

Social and economic approaches also contribute immensely in enabling women to adapt to the drought. In this regard, microloans and other financial support systems will be very instrumental in enabling them to afford such essential investments as drought-tolerant seeds and irrigation systems. This could be complemented by seeking to improve women's land ownership and resource rights, as assured land tenure and better access to resources tend to benefit women by enhancing their capability of effecting more sustainable and productive farm decisions, (Gannon and et al., 2021). Government support programs, popularly known as social safety nets, comprise food aid, cash transfers, and public works programs. They offer an important cushion in times of extreme drought, buffering direct shocks to household food security and livelihoods, (Phiri, 2016). Taken together, these women farmers' strategies in Zimba District underpin the notion of resilience and adaptability when dealing with an uncertain climate, filling the lacuna created by men in regard to their role in countering climate change.

Therefore, the literature has comprehensively created an understanding, especially about rural settings like Zimba District. A number of critical themes emerge from the empirical review to create a primary conclusion.

The impact of drought on agriculture production is gendered. Women farmers, who are significant in the agricultural sector of Zambia, suffer the full force of the deep-rooted socio-economic inequalities that reduce their access to land, financial services, and farming inputs, hence diminishing the adoption of climate-resilient farming technologies. As the review unfolds, these constraints are found to raise the vulnerability of women farmers to climate-induced shocks, such as drought, while reducing their ability to recover from the same effectively.

They also affect the socio-economic features of drought, apart from those in agriculture. As the review shows, droughts reduce household income, decrease food security, and create general socio-economic instability at the community level. Women, being major providers of household welfare, have the added responsibility of searching out water, food, and other products needed by the household in times of environmental stress. This not only increases their labor input but also detracts from their physical and emotional health and adds to the overall socio-economic strain.

This review, in addition, shows that women, in spite of these hurdles, have accordingly developed coping strategies through diversification of crops and income sources, reduction in water usage, and the establishment of cooperatives with which to pool resources together. These strategies have been instrumental in developing resilience to droughts. The major strategies are often hampered in their effectiveness by barriers at the institutional level, lack of support from local governance structures, and insufficient policy frameworks that do not address specific needs on issues of gender and farming.

2.3 Gaps in Previous Literature

Even though the available literature is supplied with reviews on the effects of drought conditions on women farmers

Although different studies are found that analyze the impact of drought on agriculture, very few make explicit the gender implications of drought, particularly in rural Zambia. Most of the gender roles-unique challenges that women face in domestic and agricultural responsibilities remain under-researched. The research should further look into exactly how these gender roles have negative implications for the vulnerability assessment of women farmers in general during drought conditions, and specifically in Zimba District, and the difference it will make to their socio-economic condition with that as compared to men.

The literature on adaptation strategies is for the most part focused on more generalized agricultural practices, with limited attention to the local, cultural, and socioeconomic contexts within which women's adaptive responses are shaped. Adaptation strategies

proven elsewhere may therefore not always be feasible or even accessible for women of Zimba District due to several localized constraints, such as a lack of access to financial resources, limited education, or gendered barriers to farming decision-making processes. There is, however, a missing link in knowing how locally-driven but gender-sensitive adaptation strategies can be developed or enhanced.

Most research regarding droughts in Zambia has not taken into consideration the role that may be played by social networks, cooperatives, or women's support systems in enabling and leveraging formal and informal preparedness for resilient development-that is, leveraging rapid onset climate-related hazards-remain key challenges toward achieving sustainable development.

Most of the works tend to focus on agricultural outputs rather than the broad implications of droughts on the mental, physical, and emotional being of women farmers. As will be discussed later in the chapter, drought may increase stress levels, lead to poorer mental health, and raise labor burdens since women always bear the highest household responsibility next to farming. There is a need for research which goes beyond crop yields in the assessment of a full spectrum of impacts on the health and wellbeing of women in Zimba District.

Most data recorded on the impacts of drought are normally short-term; hence, real changes that women farmers may go through with regard to persistent droughts are not well understood. Only a few long-term studies actually track changes in women farmers' practices, socio-economic status, and adaptive strategies over several drought cycles. It goes without saying that study areas might include an examination of these across time for possible insight into the sustainability and long-term effectiveness of different adaptation measures.

There is little literature on the level of support given by government policies, extension services, and non-governmental organizations to women farmers in drought conditions in Zambia. Little is known about how these women respond to institutional interventions-such as agricultural subsidies, access to credit, or drought-resistant seeds-in policy and practice specific to their circumstances in Zimba District. No research has looked at how

women access and benefit from such policies and what changes can be made to have their needs met.

2.4 Theoretical Framework

In the absence of relevant theoretical frameworks, the impact of droughts on socio-economic status of women farmers cannot be examined. In such a case, the relevance of the GAD framework, which puts forward the need to consider how women's vulnerability and capacity to adapt to climate change are influenced by gender roles and relations in this study, is very high. It highlights the fact that the experiences and responses of women to droughts are modeled by social, economic, and cultural contexts that often disadvantage them in terms of access to resources, decision-making power, and social support networks, (Momsen, 2010).

The Vulnerability and Adaptation framework explains further how women farmers are particularly vulnerable in the face of droughts. According to the Intergovernmental Panel on Climate Change, vulnerability is "the propensity or predisposition to be adversely affected by climate-related hazards, including droughts" (IPCC, 2014). This includes considerations for exposure to threats of climate, sensitivity to the impacts, and adaptive capacity. In this context, rural women in Zambia face the impacts of drought due to lack of access to land, water, credit, and technology; increased burdening by labor within households; and reduced decision-making power at both household and communal levels, (Tschakert and Machado, 2012).

Drawing on how experiences and responses of women to climate challenges are rooted in gender roles, societal expectations, and inequalities, the GAD framework shall underpin the investigation into the gendered dimensions of farming practices and community structures that are highly susceptible to droughts. Precisely, the GAD framework shall provide guidance on how to address the following features in your study.

This GAD framework will be important in general for obtaining an understanding of how women farmers have adapted farming practices in response to drought. The framework emphasizes the gendered division of labor and access to resources, it would therefore

provide a clear reason why women might face greater difficulties than their male counterparts in adopting new farming techniques or diversifying their practices.

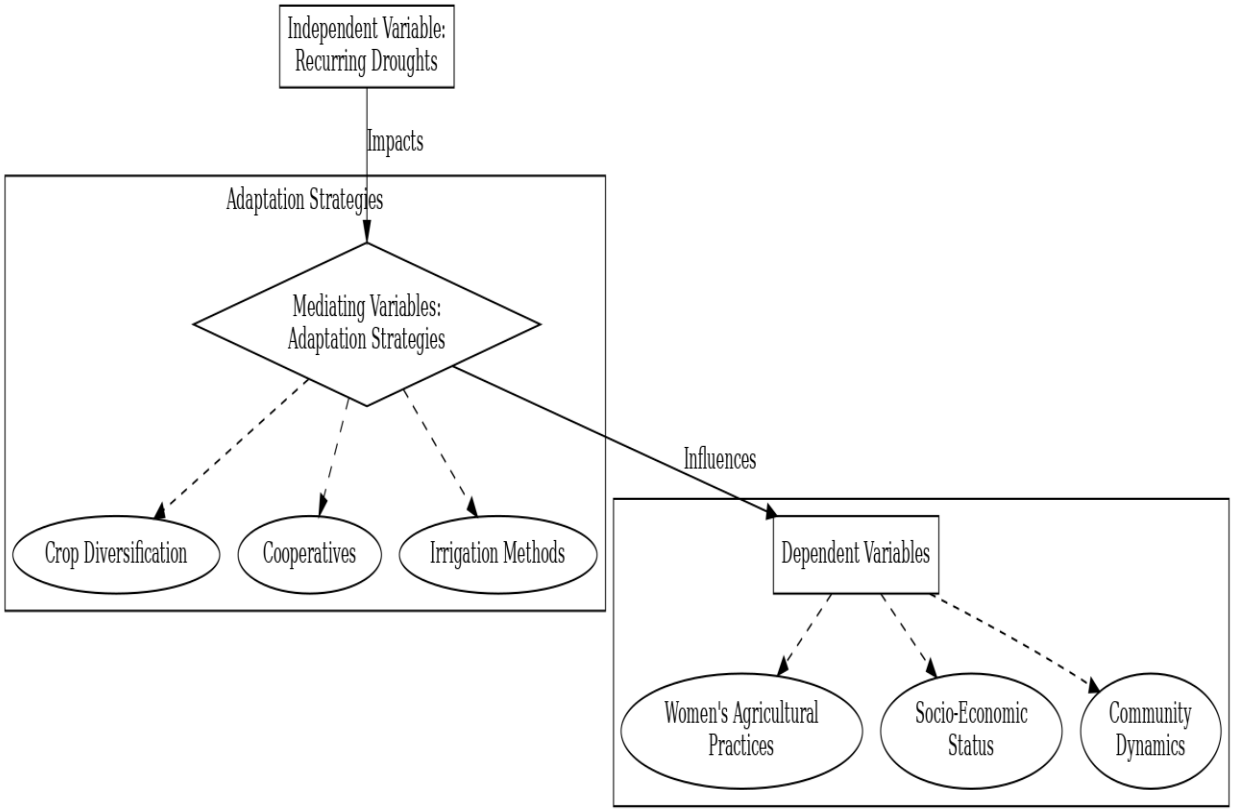
The GAD framework identifies a strong limitation in key resources and decision-making powers, arising out of gender inequalities during analysis of the socio-economic impacts that drought has on women, which exacerbate the socio-economic consequences of droughts on their livelihood.

The concepts in the framework of Vulnerability and Adaptation are important in understanding particular vulnerabilities that women suffer from amid droughts and how they adapt. According to the framework, vulnerability can be divided into three useful components: exposure, sensitivity, and adaptive capacity, enabling the exploration of how and why women are affected by and respond to climate change.

It is within this that the Vulnerability and Adaptation framework will particularly come in handy in assessing just how functional the strategies that have been adopted by the women farmers are. This helps analyze just how the strategies adopted are sustainable or merely reactive, and how the limitations in women's adaptive capacity influence the success or failure of the strategies.

2.5 Conceptual framework

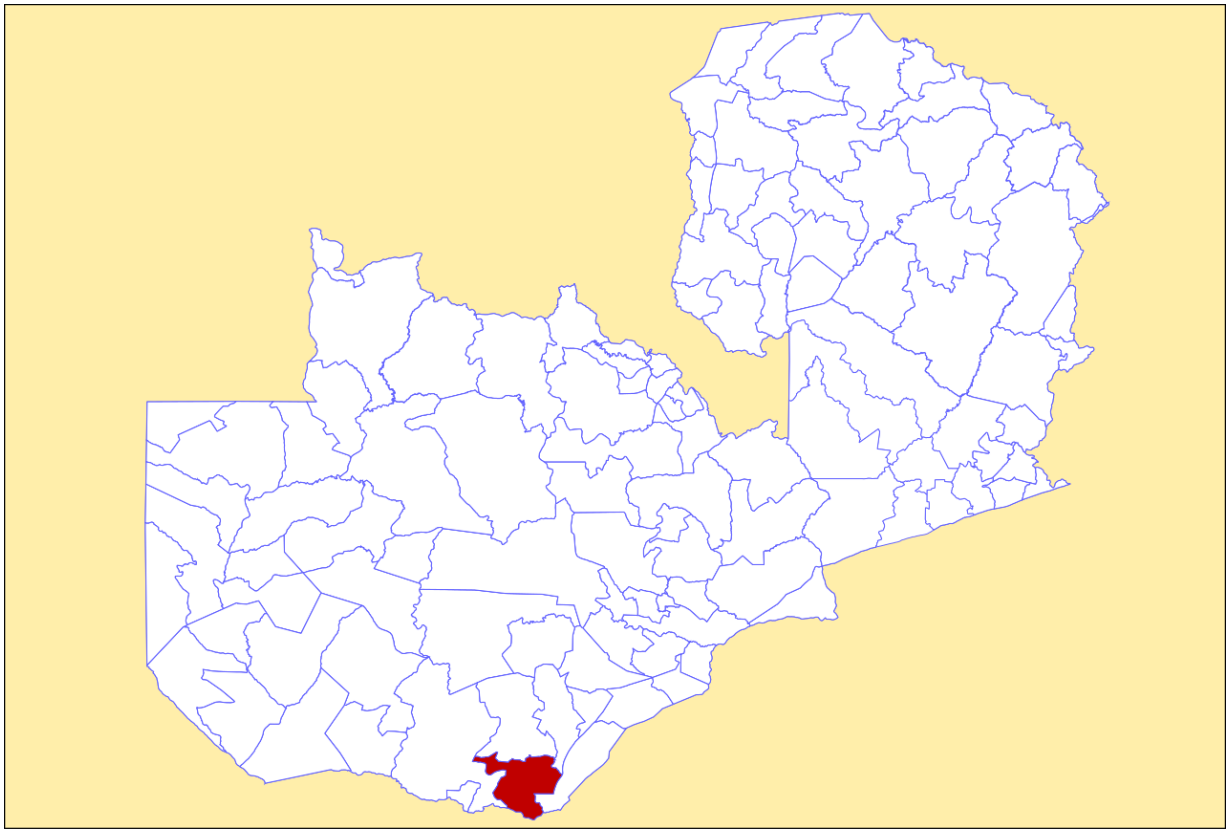
Figure 1 Conceptual Framework



CHAPTER THREE

RESEARCH METHODOLOGY

Figure 2 Map of Zimba District



3.1 Introduction

This paper assessed the impact of droughts on women famers in Zimba District. The research also identified the adaptation response strategies that women farmers have put in place to respond to such challenges.

In adopting appropriate qualitative techniques, this methodology will be better placed in capturing the multidimensionality of drought impacts and women farmers' complex

adaptive responses. Basically, this approach is yielding to the needs of understanding such complicated issues with a combination of qualitative and quantitative techniques.

These range from such key theoretical frameworks as: gender and development, vulnerability, and climate change adaptation. These are broad analytical frameworks that assist in understanding the factors affecting women in their activities both at the agricultural and communal levels. For instance, GAD theory reflects the need for considering the gendered relations of power and social norms at play in understanding the experiences of women, (Moser, 1993). The Vulnerability framework also identifies some risks and women's adaptive capacity to climate-induced droughts, (Adger, 2006).

Benefits of reliable information and rich levels of data using triangulated methods were administered through questionnaires, interviews, and focus group discussions among women farmers. Such data collection assures reliability and depth in the data capture of quantitative measures for socio-economic status and their sense of the impact of droughts. It was informed by research in African studies, agriculture, and gender studies, which might ensure that the findings are located within the current academic discourse.

3.2 Research Approach

A qualitative approach was employed in this research to explore the lived experiences of women farmers amidst successive droughts. It will seek an in-depth understanding of how these women experience the effects of drought on their agricultural practices, socio-economic status, and community dynamics. Therefore, the study adopted a qualitative approach which encourages the elicitation of rich, descriptive data through methods such as in-depth interviews and focus group discussions that reflect personal and collective strategies used by women in adapting to environmental stressors. This approach places the subjective perspectives of participants at the center and allows for a very thorough examination of how droughts impact farming practices and community resiliency. The qualitative design is, therefore, appropriate for this study in that it allows the capturing of complex, contextual, and complicated responses and allows key themes and insights to emerge from a basis in their lived realities, (Creswell & Poth, 2018).

3.3 Research Design

This study adopted a qualitative approach to be utilized in the exploratoratory of lived experiences of women farmers in Zimba District amidst droughts. It is the perfect design, since it gives utmost importance to how subjects perceive and interpret significant life events-in this case, drought and its impact on agriculture and socio-economic conditions.

This design highlights researching and seeking to understand the meaning of individuals or groups' view or interpretation towards social or human problems. In this category, data are gathered using open-ended questions, interviews, or observations. These were analyzed thematically. Common qualitative approaches include case studies, ethnography, grounded theory, and phenomenology (Cresswell, 2014).

With deep accounts elicited from respondents through in-depth, semi-structured interviews and discussions in focus groups. Simultaneously, personal accounts of subjective experiences regarding drought will be established through interviews, whereas community-level adaptations will be established through focus groups, (Van Manen, 2016).

3.4 Study Population

The population for this study is taken to be the women farmers in Zimba District. Zimba District is an ideal location for examining the effects of climate variability on women's farming activities and socio-economic status because it is semi-arid, with frequent cases of droughts being reported, as documented by (Mubanga and Ferguson, 2017).

The targeted population consisted of women aged 20 years or older who are actively engaged in farming within Zimba District. In the study, all types of farming activities, from small-scale to larger agricultural operations, were considered. The target of the research is women who have farmed in the area for four or more consecutive years, guaranteeing their exposure to at least two cycles of drought and hence establishment of possible adaptation strategies, (Nyantakyi-Frimpong, 2019).

The population that was studied included women of different socio-economic classes, education levels, and marital status in order to capture a heterogeneous range of

experiences. This approach is premised on the understanding from intersectional feminist theory that the ways in which women experience climate change are shaped by multiple and intersecting factors.

Moreover, the sampling will include key informants who are local agricultural extension officers, members of community leadership, and representatives from women's farming cooperatives. They will provide contextual information to the study and help in validating the findings from the primary population, (Meinzen-Dick and et al., 2014).

Kumar (2011:193) defines the sample size as the number of people from whom the researcher obtain the required information. Calculating the sample size in this research with a population of Zimba District which is about (109,307) the same formula in the case of a finite population, only altering its population size parameter. In that way, the sample size was representative-including the larger population-but retained the same level of confidence and margin of error.

3.5 Sample Size

Using the 2002 population of Zimba District of about 109,307, the sample size for this study is 383 women farmers to be representative enough for the study, at 95% confidence with a margin of error of 5%.

n= sample size for an infinite population, n= corrected sample size for a finite population, Z= Z-score corresponding to the required confidence level, taken as 1.96 in the case of 95% confidence, pp= proportion of interest to estimate in the population, assumed as 0.5 for maximum variability.e= margin of error, assumed as 0.05 for 5%, N= population size, assumed for the Zimba District to be 109,307

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$
$$n_{corrected} = \frac{n}{1 + \frac{n-1}{N}}$$

Purposive sampling was used in the study. Women farmers were purposefully engaged in depth through semi-structured interviews and focus group discussions. This sample size was adequate to ensure data saturation, where no new themes or information come out from further interviews. Study participants were selected using various criteria, such as age, farm size, and past experience with droughts to ensure that a broad spectrum of views is covered, (Guest, Bunce and Johnson, 2006).

This research used purposive sampling for rich and detailed information from the respondents in terms of lived experience and adaptation strategies. Basically, it involved selecting respondents based on certain predefined criteria that relate to the research questions. The criteria for the selection of women who would participate in this study entail those who have far-reaching experience with droughts, those using innovative adaptation strategies, and those coming from different socio-economic backgrounds, (Patton, 2015).

3.6 Data Collection/Instruments

This study adopted qualitative methods of data collection in examining the lived experiences of the women farmers in Zimba District and the strategies they adapt in response to droughts. The tools used in data collection will included semi structured interviews, FGDs, and key informant interviews; these guarantee that deep, narrative responses were obtained from its participants.

Kumar (2011:144) defines an interview as a verbal interchange, either face to face or through a telephone, where the interviewer tries to elicit information from another person.

Semi-structured interviews shall be the primary means of gathering data. In such an interview environment, open-ended questions will be asked, enabling the participants to give elaborate descriptions concerning their experiences with drought and changes that it has brought upon agricultural practice, socio-economic status, and community dynamics. The flexibility inherent in this approach allows probing and follow-up questions, which can be quite instrumental in exploring unexpected themes.

FGDs conducted in order to analyze community-level responses through collective action taken in response to drought and strategies adopted for collective adaptation. Discussions with groups of 6-8 women farmers helped in obtaining information on how shared experiences shape adaptation practices and community resilience. A discussion guided on focus groups was developed highlighting the key talking points on the impacts of drought on agriculture and community dynamics.

Key informant interviews were carried out with the local agricultural extension officers, community leaders, and representatives of the women's farming cooperatives. These interviews gave insight into contextual and expert opinions concerning drought adaptation strategies and how effective the support programs are toward women farmers.

3.7 Data Analysis

In this study, qualitative data analysis was integrated to give comprehensive results on the effects of droughts on women's socio-economic status in Zimba District. This also established the potential adaptation strategies adopted by women farmers.

3.7.1 Qualitative Analysis

The qualitative data from the semi-structured interviews and focus group discussion were analyzed. The steps followed in qualitative analysis:

Transcription: Verbatim transcription of all the interviews and focus groups allowed for accuracy and provides the possibility of a detailed analysis.

Themes, were further refined and validated to make sure that they do cover the data. Information was encoded and transferred into qualitative data analysis software. This

move was important in making sure that the management and organization of the data have easier ways of tracking down codes, themes, and relationships within the data.

This worked well with data triangulation to enhance the validity and reliability of these findings. Data triangulation refers to cross-checking information from various data sources and methods: quantitative surveys based on questionnaires, qualitative interviews, and focus group discussions. Such triangulation attempts at identifying the consistencies and discrepancies of the data to provide a more comprehensive understanding of the research questions.

3.8 Ethical Considerations

This research calls for keen attention to ethical considerations put in place to protect the well-being and rights of participants throughout the study process.

Informed Consent: Participants were informed clearly and fully on the study's purpose, methods, and risks and benefits. Information was provided in vernacular languages for clear understanding, and participants were at liberty to ask questions before giving free consent, (Resnik, 2018).

Information Confidentiality and Privacy-The research team had stringent measures in place that consider the protection of participants' identity and information. This research anonymized data and also, access to this data was limited to only authorize personnel, (Resnik, 2018).

Power Dynamics-Possible power imbalances between researcher and participants underlie the reason for using participatory approaches to value local knowledge and experiences. The approach was used to create an environment that is more equal for research, (Resnik, 2018).

Ethical Approval: The study protocol will be reviewed and approved by the ethical review of the institution.

CHAPTER FOUR

PRESENTATIONANDANALYSISOF RESULTS

1. Introduction

This chapter presents the findings from the study, which investigated the impact of droughts on women farmers in Zimba District. The data was collected using semi-structured interviews, focus group discussions (FGDs), and key informant interviews. The findings are organized into themes aligned with the study objectives: changes in farming practices, socio-economic impacts, effects on community dynamics, and the effectiveness of adaptation strategies.

4.2 Socio-Demographic Characteristics of Respondents

The study sample consisted of women farmers aged between 20 and 60 years, representing various socio-economic backgrounds. Most respondents had over five years of farming experience, ensuring substantial exposure to the impacts of droughts. A significant proportion of respondents had no formal education or only completed primary school, which influenced their ability to access resources and adopt new farming technologies.

Table 0:1 *Age Distribution*

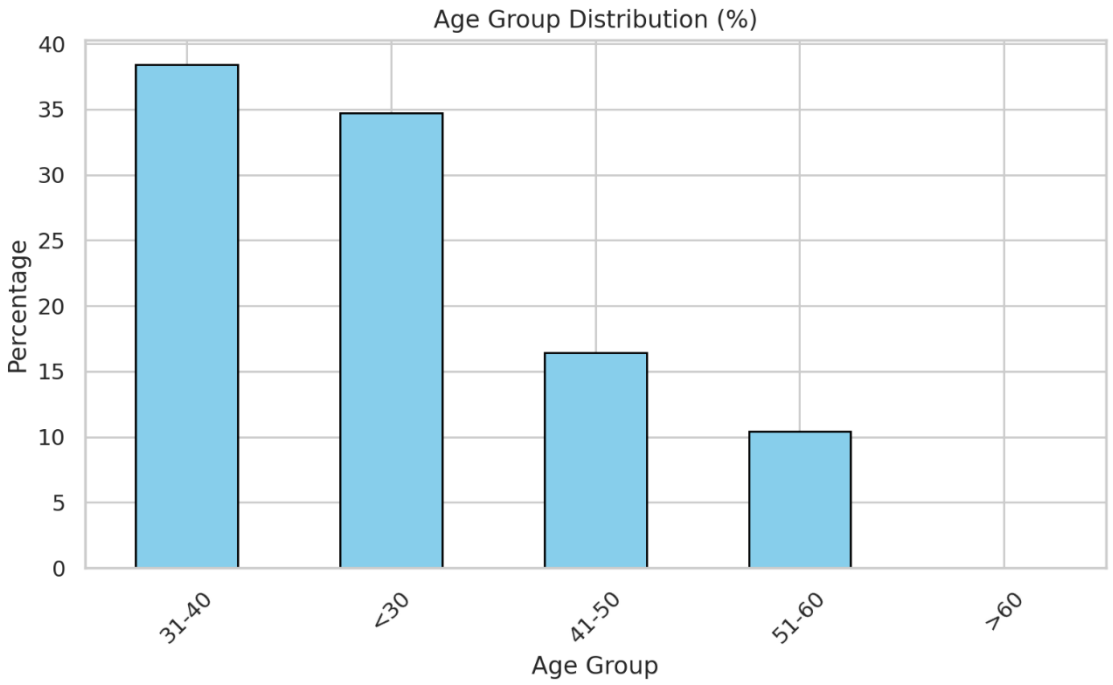


Table 0:2 *Marital Status*

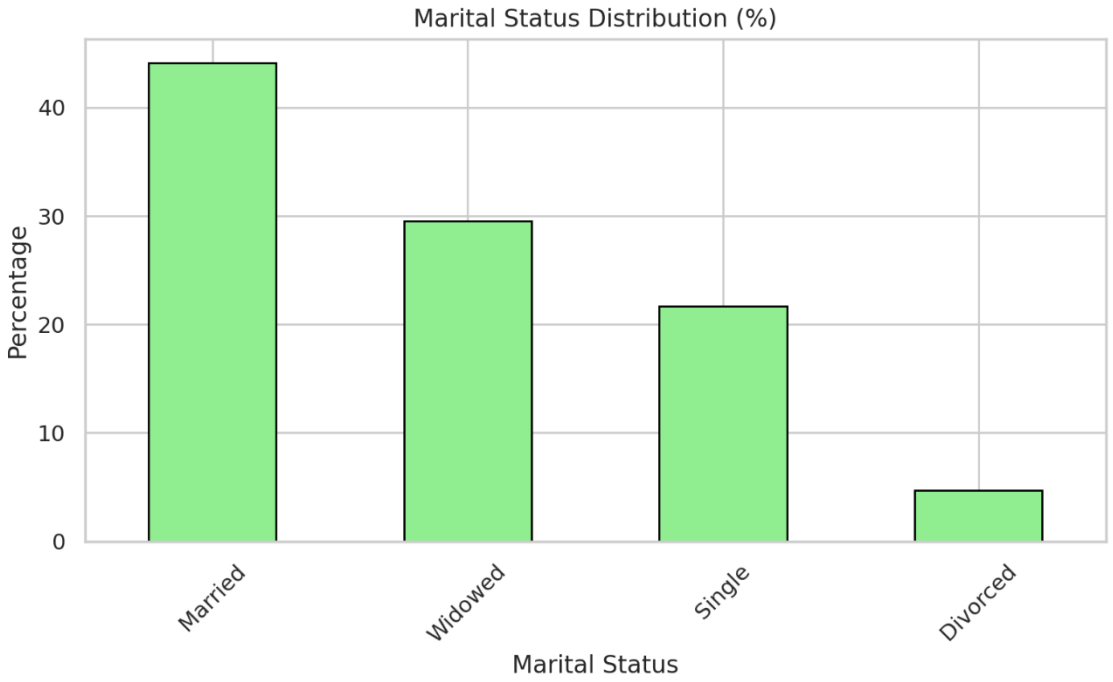


Table 0:3 *Education Levels*

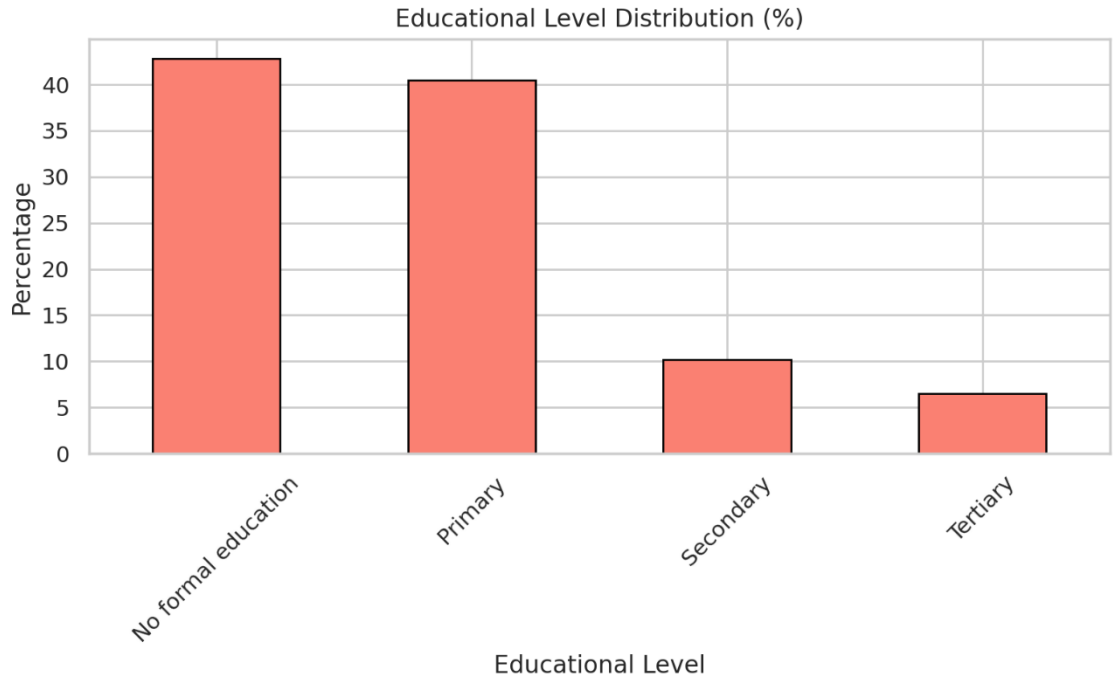


Table 0:4 *Farming Experience*

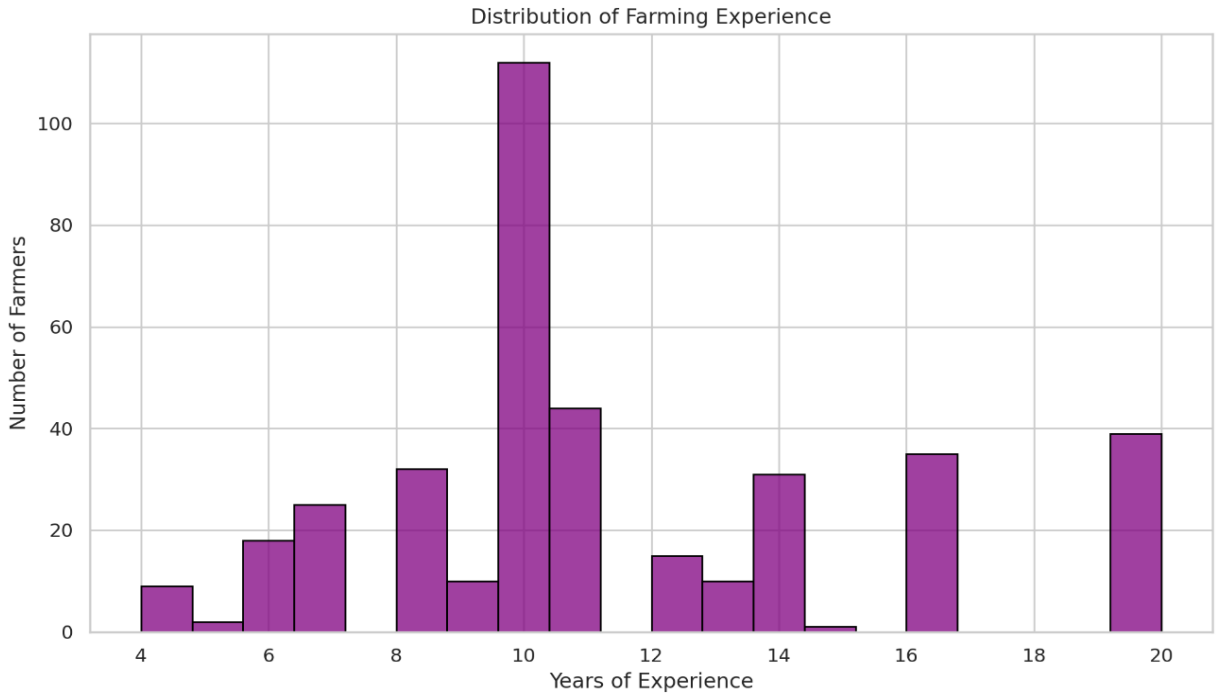
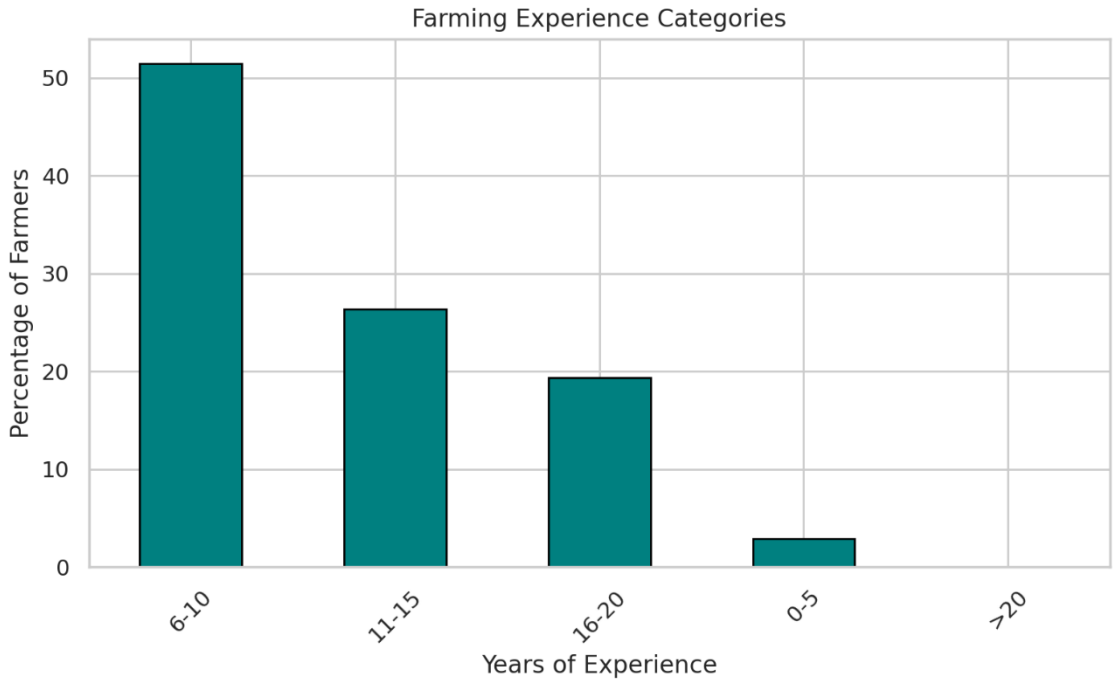


Table 0:5 Categories of farming experience



Based on the socio-demographic analysis:

- ❖ Most respondents are between 31-40 years old (38.4%), Majority are married (44.1%), 42.8% have no formal education, followed by primary education (40.5%)

The data shows most farmers have 6-15 years of experience, with a mean of 11.4 years. The distribution peaks around 10 years, with very few farmers having more than 20 years of experience.

4.3 Changes in Farming Practices Due to Drought

The study found that women farmers have had to make substantial changes in their agricultural practices to cope with drought conditions.

Figure 2 shows the percentage of farmers who have changed their type of crops due to drought. The largest group is those who have changed; this shows the impact thatdrought has had on agricultural activities. From figure 2, one will clearly understand the degree at which drought has influenced the changing of crops among the people.

Figure 3 *Changes in Crop choices*

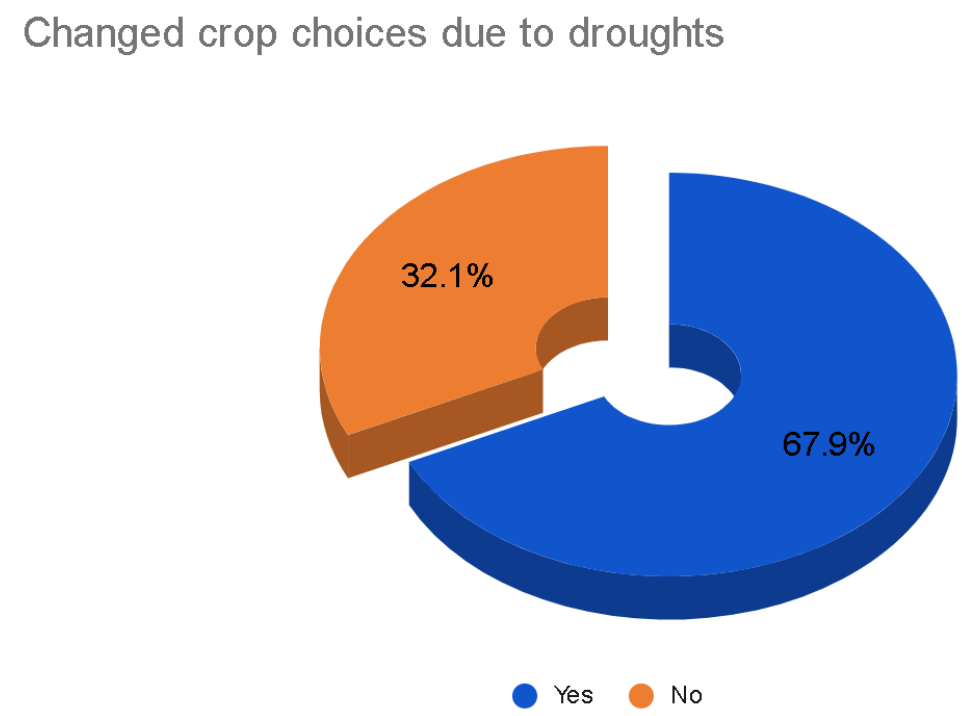


Figure 4 *Droughts effects vs strategies*

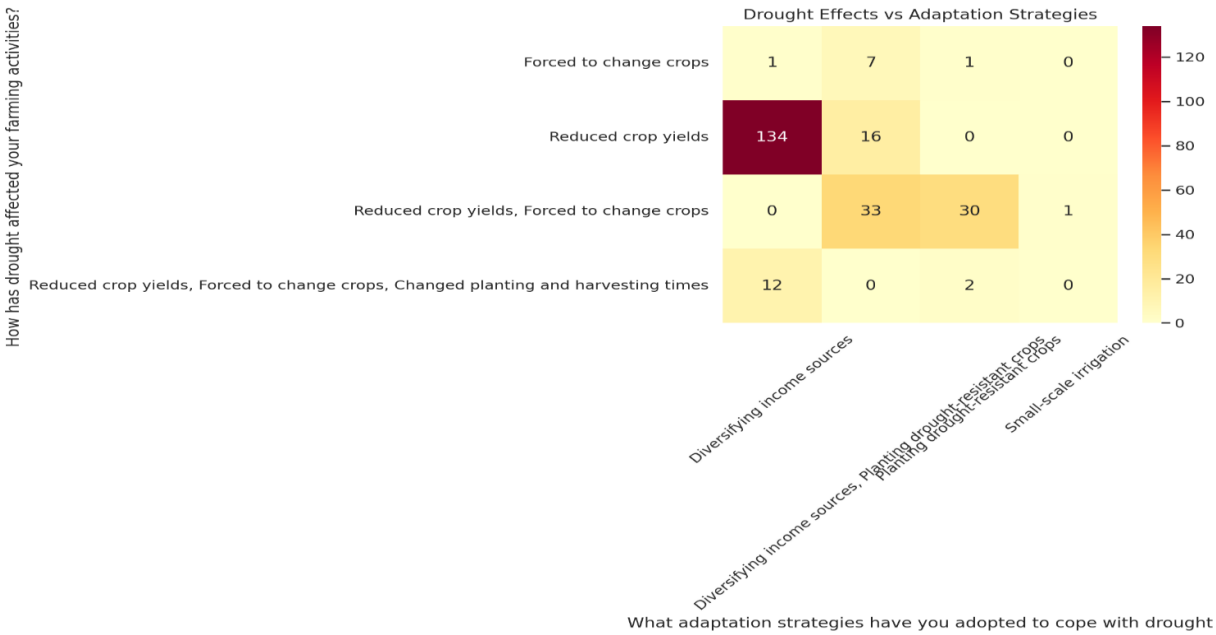


Figure 3 reflects the cross-tabulation of how drought has affected farming activities and coping strategies adopted. The color intensity corresponds to frequency, with darker shades showing higher frequencies. This will be useful in finding the most frequently adopted adaptation strategy for farmers as concerning any specific impact caused by the drought. These graphs summarize changes in farming practice, economic impacts, and adaptation strategies resulting from the drought

4.4 Socio-economic Impacts of Drought on Female Farmers

Droughts have had devastating socio-economic impacts on the women farmers, which are described below:

Reduced Household Income: Most respondents reported that their income drastically decreased owing to poor crop yields. The respondents, therefore, attributed this economic stress as a cause for not investing in farming inputs, payment of school fees for children, and other household needs. This is shown in Table 6.

Food Insecurity: Most respondents pointed out that droughts precipitate food shortages, which force families to decrease meal sizes and frequencies. Because women are the primary caregivers, they experience much more significant stress in securing their households' food. This is shown in figure 4.

Increased Labor Burden: Women reported that they spent more time and effort fetching water and seeking alternative sources of income. This added load of work adversely affected their health and decreased the time they had for farming activities. This is shown in figure 5.

Table 0:6 The impact of drought on household income

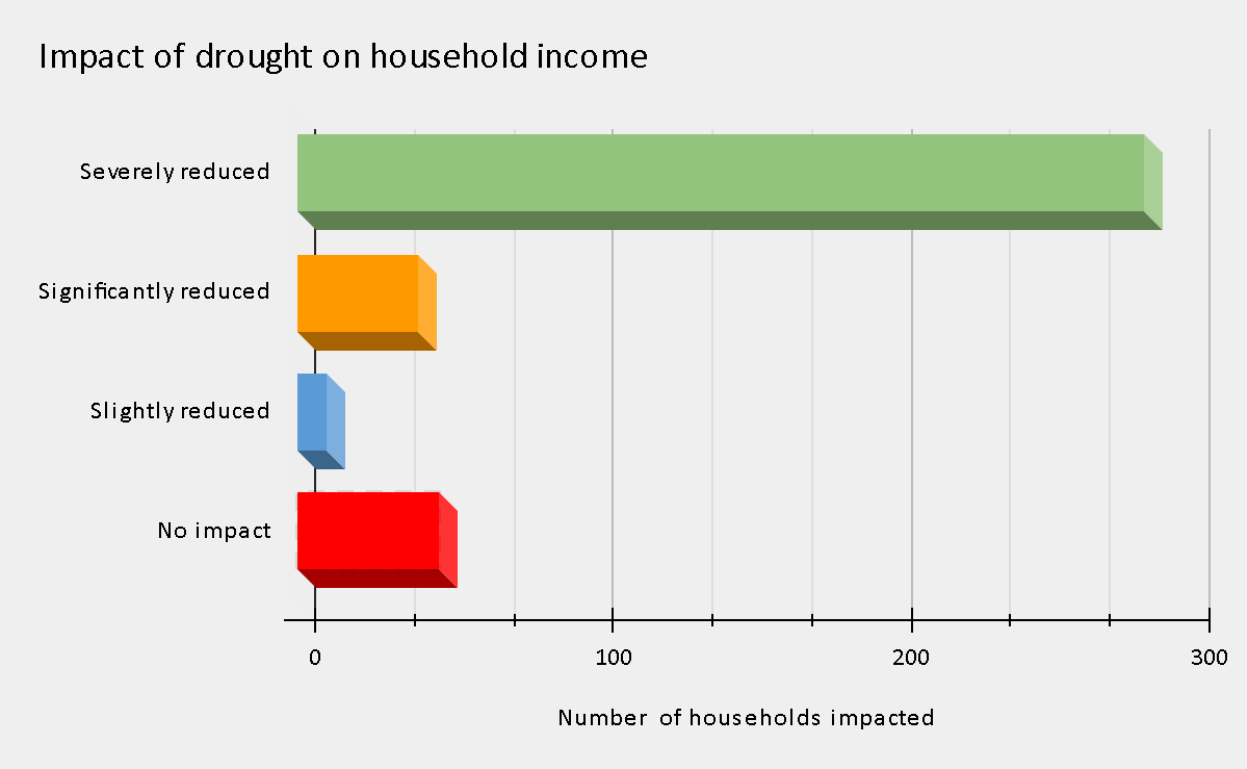
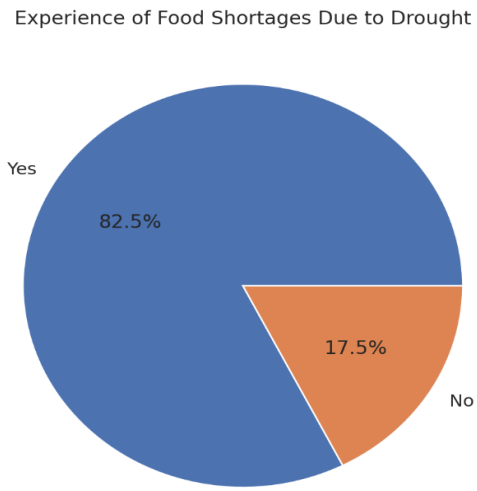


Figure 5 Food Shortages



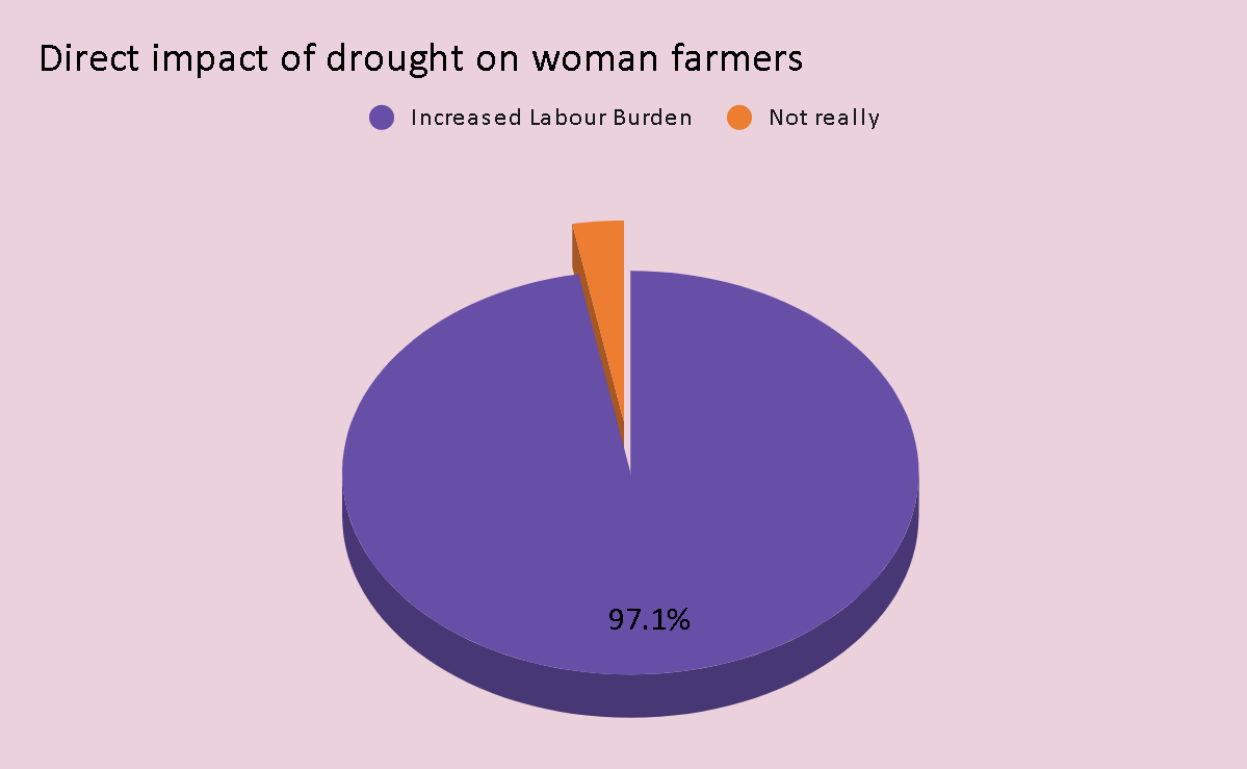


Figure 6 Impact of drought on women farmers

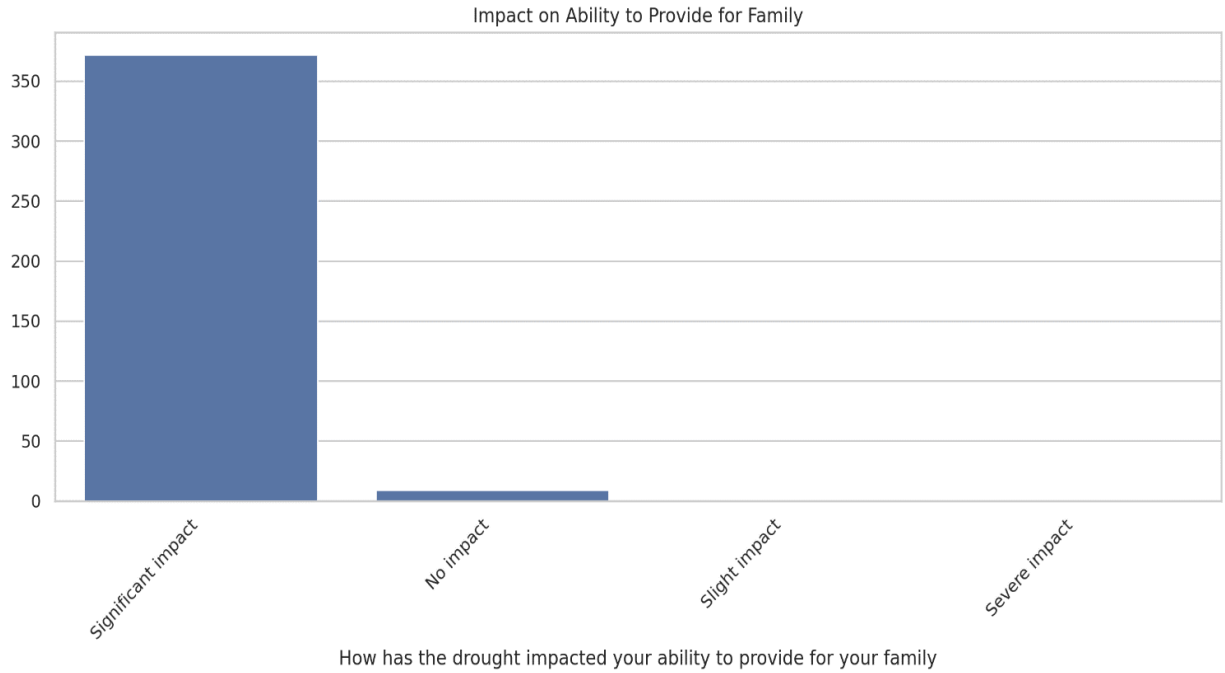


Table 0:7 Impact on Family Provision

These visuals highlight the significant challenges faced by women farmers due to drought, including reduced income in their homes, increased food insecurity, increase labor burdens and inability to provide consistently.

4.5 Drought Impact on Community Dynamics

Drought-forced resource scarcity has caused dislocation of traditional social structures in Zimba District but has also brought up different ways or initiatives of coping.

Emergence of Cooperatives: Partly in response, several women created cooperatives in which they combined their limited resources, shared their acquired knowledge, and lobbied together for outside assistance. Cooperatives seemed to play an important role in rebuilding social cohesion and engendering collective action.

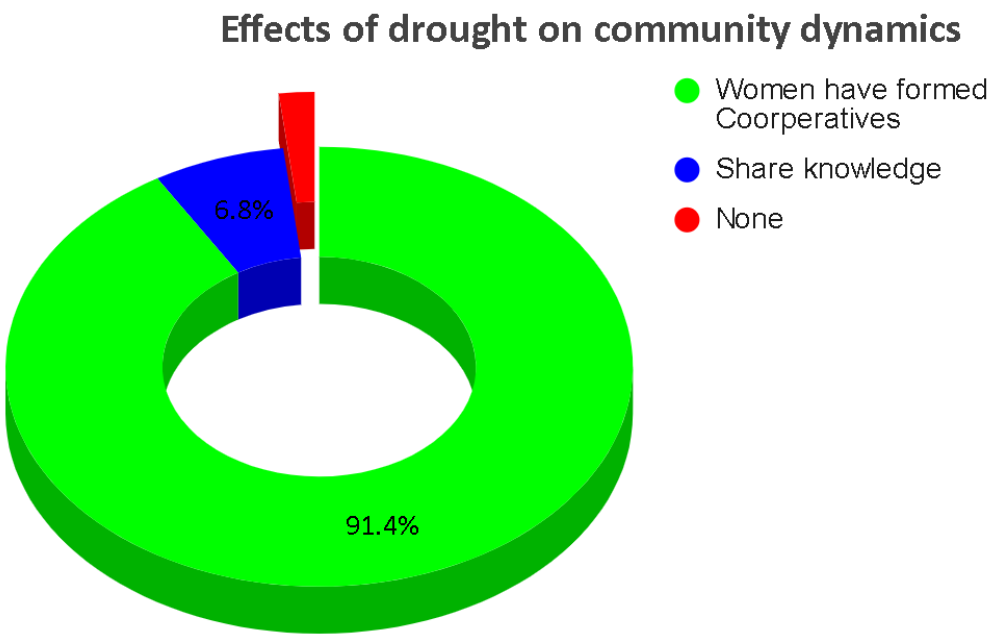


Figure 7 Community Dynamics

The following figures illustrate the development of cooperatives along with other strategies as the main responses to drought challenges.

4.6 Effectiveness of Adaptation Strategies

The effectiveness of the adaptation strategies adopted by the women farmers in lessening the impacts of drought was assessed as follows;

Diversification of Crops: The actual switching to drought-tolerant crops, though effective in reducing vulnerability to water stress, was limited due to poor access to seeds and deficient extension services. This is shown in figure 7 and Table 8.

Income diversification: Women supplemented incomes with small-scale businesses and rearing of livestock. These have, however remained hampered due to shortage of capital as well as poor access to markets.This is shown in figure 7 and Table 8.

Community-based strategies: Cooperatives and other informal support groups have been important in promoting resilience. Participants underscored that training and capacity building programs can reinforce their contribution. This can be traced in figure 6.

Institutional Support: Most of the respondents reported that the government and NGO interventions-such as training programs or provision of farming inputs-are very inadequate and poorly targeted. This is shown in figure 8.

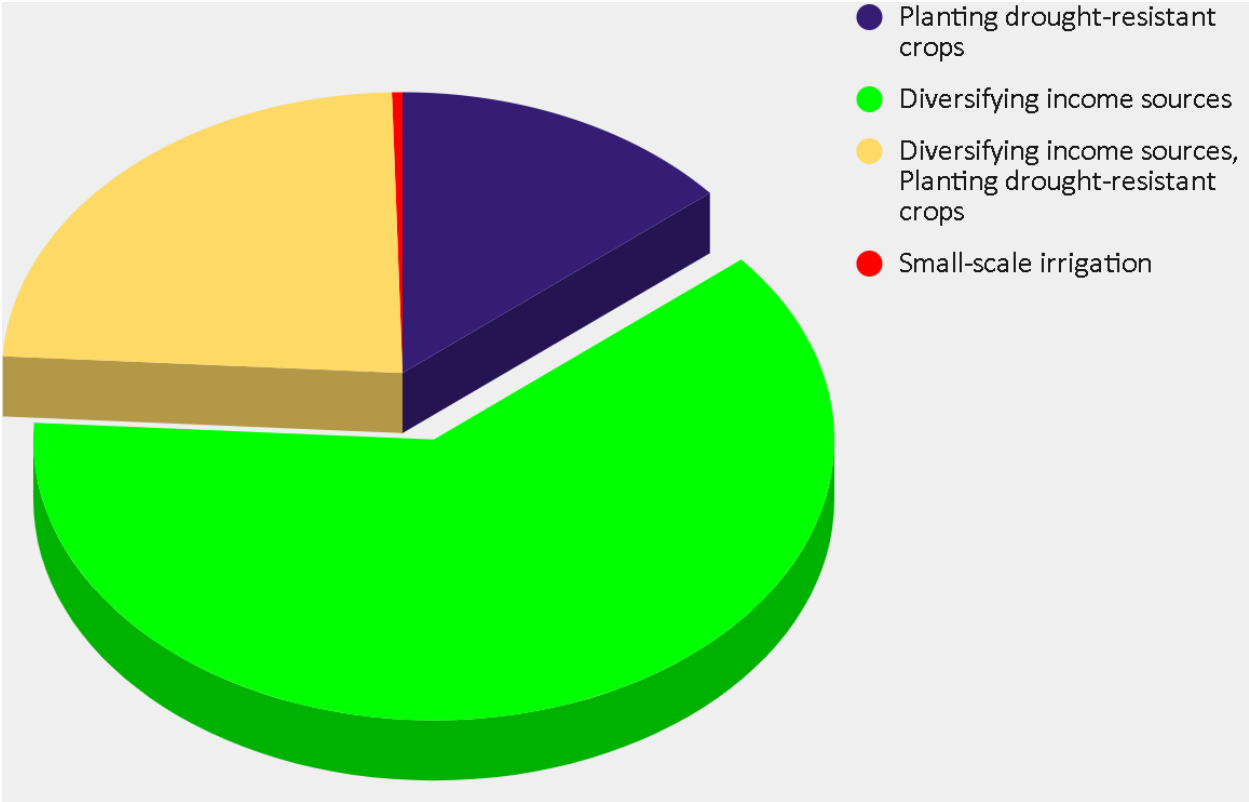


Figure 8 Adaptation Strategies

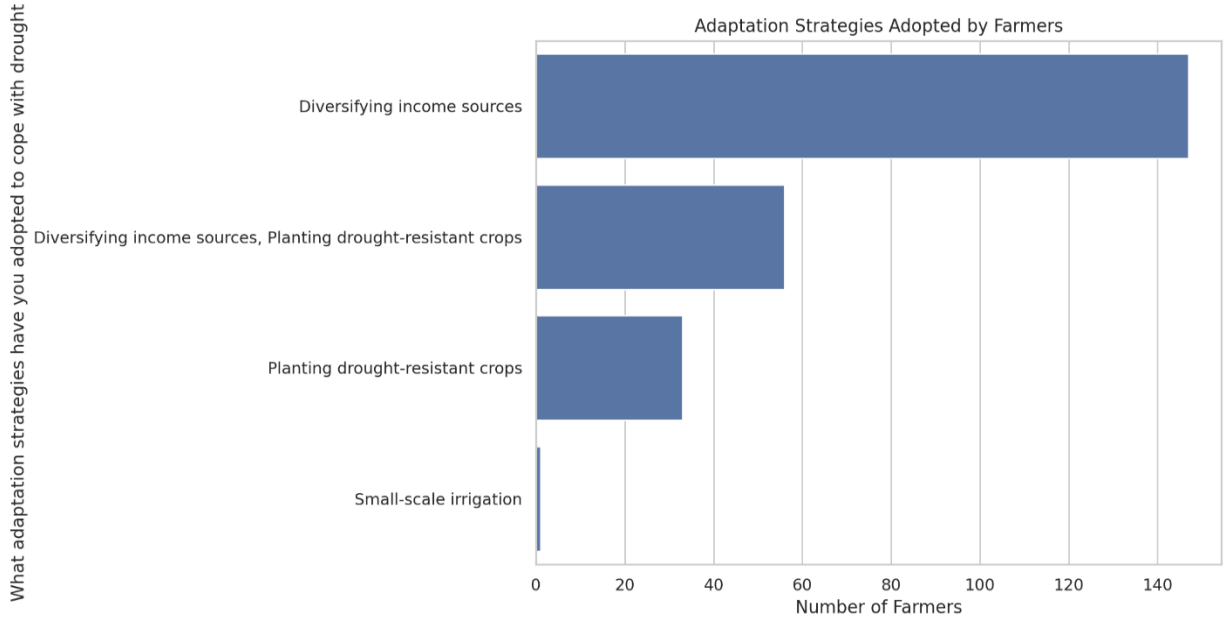


Table 0:8 Adaptation strategies

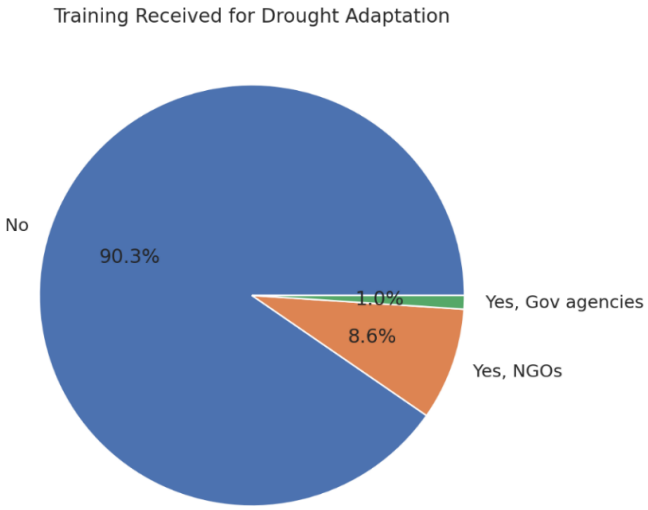


Figure 9 Training received

CHAPTERFIVE

DISCUSSION OF RESULTS AND FINDINGS

5.1 Introduction

This chapter represents the findings of Chapter Four into the impact that drought has had on woman farmers in Zimba District, and it progresses the implications of such changes as witnessed in farming or socio-economic effects, influencing the community dynamics towards the adoption of certain strategies. These results are also backed by discussions and first hand explanations from these women.

5.2 Women farmers and changing their farming practices due to droughts

Crop diversification is one of the key strategies that women farmers in Zimba District try to adapt to mitigate the impacts of consecutive droughts figure 2 in chapter four on crop choices has shown this. Planting drought-resistant crops and changing the type of crops planted, farmers attempt to make livelihoods less vulnerable to uncertainty in rainfall and water availability.

Diversification has been the major contributor to the increased resilience, as farmers' reliance on one crop reduces and thus spreads the risk of total crop failure. Farmers incorporating drought-tolerant crops report relatively stable yields as compared to the traditional staple maize crop, which is highly sensitive to water stress.

While crop diversification holds promise, the practice has its limitations. Soil compatibility, market accessibility for uncommon crops, and knowledge gaps in handling diverse crops have been major deterrents to scalability. Education and training will be highly important, along with strengthening market linkages, to incentivize wider adoption over the coming years. As seen in figure 8, most women have not received any training or education on how to go about farming with this drought.

In an interview Responded 26 explained the following concerning this:

"As a farmer, I had always been interested in trying new approaches, and crop diversification seemed like a great idea when I first heard about it. It sounded like a solution for our problems: improve the soil health, reduce risks from reliance on a single crop, and maybe bring in better income. But once you get into it, you realize it's not smooth sailing, like some of these people portray it. First, not every crop can thrive on every piece of land. For instance, my soil here is perfect for maize and beans; that's why I've been growing it for so many years. When I attempted to plant something else, it became an uphill struggle for them to thrive.

Then, there is the problem of markets. Growing is one thing, but you have to have someone to sell it to. With maize and beans, I know that demand is steady and can be predicted. But when I tried to grow something less common, I quickly learned that finding buyers wasn't so easy. The closest market where I could sell the same was miles away, and by the time I transported it, the costs had eaten into any potential profit. It is also risky because should the buyers not come through or prices fall, you are stuck with a crop you cannot sell.

Knowledge is another challenge. Different crops have their own needs-for example, planting schedules, water requirements, pest control methods, and even harvesting techniques. For someone like me, who's been focused on a few staple crops for years, learning all that for multiple new crops is overwhelming. It is easy to make mistakes, and in farming, mistakes cost time and money, both of which are already in short supply. If there were more accessible training programs or workshops that could help farmers like me understand how to manage these crops, then diversification may be more practical.

I do believe in crop diversification, but for it to work for most farmers, farmers need more support; we need experts to guide us on how to make our soil work for different crops. What we want is better links to the market so we can be certain of selling what we produce at reasonable prices. If that isn't in place, most of us will stick to our current crops because doing anything different will just increase risks. Farming is already uptight with uncertainty; most of us cannot afford a gamble on something not tried or tested."

Shifting the planting schedule to adhere to the changing climatic patterns has also been one of the adaptation strategies in which early warning systems along with traditional knowledge has served very handily.

However, the unpredictability of rainfall is increasingly becoming a big challenge. The unpredictability of droughts and delayed rains has made the timing of planting activities difficult. Without accurate and localized weather forecasts, farmers often gamble on planting decisions that can either lead to premature failure or loss of growing opportunities.

In an interview Responded 49 explained the following concerning this:

"Nowadays, rains are one of the major setbacks I face as a farmer. When I was growing up, we almost seemed to be able to tell time by the rains. We knew when to plant, when the fields should be flourishing, and when it was time to harvest. But now, things are gradually changing, and it makes our work more difficult than ever. We have got rain in this area now that's just like gambling to decide when we plant. Sometimes the rains come early, sometimes very late, and sometimes never at all. Droughts seem to creep on us unnoticed, leaving our fields dry and our crops starved.

Delayed rains are yet another big problem. We try to plan everything with the growth season, but how can we when we do not know if the rains shall come on time? When I plant too early and the rains are delayed, the seeds may not germinate at all, let alone wither before they can even begin to grow. But then if I wait too long for timing to improve, I'm sure to miss the brief planting window. It's always an exacting decision, but usually one we have to make somewhat blind. Last year I had to plant twice because the first time my crops dried up, literally.

It is challenging because there's really not good, reliable local forecasts, this year they told us that we will have rains but I doubt if that is true because they are never right. Sure, you can listen to the radio or check your phone for the forecast, but most of the time those predictions don't account for the specific conditions in our area. A forecast might say rain is coming, but it might fall miles away and not touch our fields. Or it might warn of drought,

and then we end up having unexpected downpours that flood the crops. Without reliable information, we are left guessing, and in farming, guessing can cost you your entire season.

Sometimes I look at the seeds in my hands and wonder if I am making the right choice. Should I plant now and take a chance, or should I wait and risk running out of time? These decisions weigh heavily because it is not just about me; it involves my family and the people who depend on what we grow. The stress persists, knowing that a single wrong decision could mean everything between a good harvest or a failed one.

How different it would be with better tools, Just imagine being able to plan with confidence, knowing when the rains would come and how much to expect. It won't just save us from guesswork; it will save us from wasting seeds, labor, and time. I strongly believe technology has the potential to bridge this gap, but it needs to reach us, the smallholder farmers, and it needs to be affordable and practical for our realities. Even other means of getting around drought.

Meanwhile, we do the best we can and adapt to the changing climate, as one would expect, doing what farmers have always done: hope for the best and prepare for the worst. But it's clear that if something doesn't change, this struggle with unpredictable rainfall will only get harder in the years to come."

Respondent 7 also added that:

"Over the years, with the increasing frequency and intensity of droughts, many women farmers like me have been forced to go back to the drawing board and adapt our farming. Previously, I heavily depended on growing maize as my staple crop, but with the extended dry spells, I observed that maize could no longer thrive without consistent rainfall. I began to shift to more drought-resistant crops such as millet, and cassava. These crops are more tolerant of dry conditions and, although perhaps not yielding as much profit as was the case with maize, they ensure that my family has something to eat and sell.

I remember a certain lady in our village who adapted to sunflowers and groundnuts, being less sensitive to draughts and providing her extra source of income from the oil and nut

sale. She inspired many of us to start diversifying our crops and strategize how to make our farms more resilient to climate change. It is this collective effort and sharing of knowledge among women that has been instrumental in helping us try to rise above the challenges of this ongoing drought."

5.3 The socio-economic impact of drought s on women farmers.

The findings also revealed that the socio-economic status of the respondents in this study, was a summation of their education level, sources of income, labor burdens, and resource availability.

As shown in Table 3 that 42.8% had no formal education, while 40.5% of the respondents only completed primary school. Such a level of education will clearly limit the capacity of these individuals in terms of harnessing valuable resources and technologies which help in stabilizing agriculture upon the likelihood of drought periods.

The socio-economic impacts of droughts have drastically reduced household incomes for most respondents as shown in Table 6 and as explained in literature review by, (Dercon, 2004).Poor crop yields have limited the ability of women farmers to invest in farming inputs, pay school fees, or meet other essential household needs. Some have pursued diversification into other income sources such as small-scale businesses and livestock rearing but remain constrained by limited capital and poor access to markets.

Because of the dual role in farming and caregiving, the women bear an unbalanced labor burden. This was noted to come with the drought conditions as they have to fetch water as well as seek alternative employment. This added tasks hurt their physical health and lessened time for useful agricultural work. This is also explained by Sorenson and et al. 2011, and Harris, 2014). In literature review, the two explained that;

> *Labour burden for women increases during droughts. In most cases, this requirement makes women, who are usually primary caregivers to travel longer distances for water collection, using valuable time and energy that might have been directed toward agricultural activities or alternative income-generating activities. Increased workload of this kind usually leads to physical exhaustion and*

thus lowers overall productivity for their agricultural effort. Moreover, the responsibility of searching for food for the family in scarce periods increases the stress levels of women, making them further vulnerable.

Drought conditions have exacerbated the food insecurity situation of households as shown in figure 4; many respondents reported a reduction in meal sizes and frequency. Women, being the primary caregivers, are under considerable stress to obtain food for their families, adding to their vulnerability.

Regardless, women have demonstrated resilience in this case through cooperatives that help them share resources and knowledge. These programs contribute to social cohesion and collective action that enhances their capability of adapting to drought conditions. However, these strategies have been constrained by inadequate institutional support and limited access to essential services or training as shown in figure 8.

Respondent 16 explained the following concerning this:

"Drought has continued to reduce our household income through the persistent decline in crop yields over the years. The increased frequency and durations of dry spells make growing enough food to sell and even for the family very difficult. This situation forces my husband to have to leave our community to go to the nearby town looking for work, as alternative sources of income have dwindled. Such changes mean that my family must share additional emotional and economic pressures since we have become accustomed to living on erratic returns from his occasional jobs. In addition, it means I have to solely assume responsibility for managing the household and the fields, which is physically and emotionally tiring, especially given the extended drought situation."

Responded 22 also added that:

"As a woman farmer, the socio-economic impacts of droughts have been deeply felt in nearly every aspect of my life and the lives of others in my community. Drought has significantly reduced our agricultural output, which directly translates to a loss of income since most of us rely on selling surplus crops to meet our financial needs. With droughts, there is often very little left to sell after setting aside food for our families, and sometimes

even that is not enough, leading to food insecurity. This has forced many women, including myself, to seek alternative sources of income, such as engaging in small-scale trading or casual labor, but these are often unstable and low-paying options.

The burden is heaviest on us women, as we are traditionally responsible for managing household budgets and ensuring that our children are fed and schooled. With reduced income, I have had to make very tough decisions.

Because of these droughts, sources of water dry up; hence, to fetch water, I have to walk long distances, time that would otherwise be constructively used on the farm or any other place with an income generating activity. This extra workload often leaves me exhausted and limits my ability to focus on improving farming practices or exploring new opportunities.

The drought has changed the social dynamic of the community as well. My family is no exception to having been obliged to send men to towns and cities for employment, which in turn means leaving the burden of farming aside from household responsibilities on women. Although we have developed informal support networks through which to share resources and advice, such as women's groups, without institutional support, it's hard to recover from one drought before the next. Some of the women in our group, for example, have shared how they have had to sell off key household items, livestock or farm equipment just to survive, which only deepens their vulnerability to future shocks.

On a larger scale, this has meant that women's options for economic independence and participation in decision-making have been relatively limited. For example, I have found accessing credit or government help an almost impossible task because I lack collateral and formal education; this makes it hard for me to invest in either drought resistant seeds methods or an irrigation system, among many other innovations that would really improve productivity. This only serves to worsen the cycle of poverty and further reduce our potential resilience to future crises.

The socioeconomic impact of droughts is not just about losing crops, it's about losing stability, opportunity, and dignity. These challenges require more than temporary aid. We

need structural changes in better access to resources, training, and financial support that cater to the specific needs of women farmers. Only then can we begin rebuilding our livelihoods and communities in a manner that is sustainable and resilient."

5.4 Effects of droughts on communities and social structures concerning women in Zimba District.

According to the women in Zimba, cooperatives in their lives help them compete against adversities created by droughts. In this process, the emergence of cooperatives is seen not simply as an organizational unit but as a most essential mechanism for building resilience and fostering solidarity among women who confront common adversities. Because of the low agricultural yields due to drought and high scarcity, women have sought cooperatives as an avenue to address such challenges collectively.

As shown in figure 6 in Chapter four, 91.4% of women participate in these cooperatives. Cooperatives provide a venue at which women can collectively merge otherwise limited resources, through which they are able to attain what would have otherwise not be possible at the individual level. For instance, through the pooling of funds or labors, such groups have acquired vital farming inputs like seeds resistant to drought and also fertilizers and simple irrigation gadgets, which would still have remained unaffordable by most members. Their access to shared resources means there will be fair benefits realized amongst members while limiting this exposure to individual households.

Besides resource pooling, cooperatives also play a very important role in knowledge sharing as 6.8% accepted to be enjoying these cooperatives because of the knowledge that is shared. Women share farming techniques within these groups, like crop diversification and water-saving practices, which have proved effective in cushioning against drought impacts. The cooperative model facilitates access to external expertise, such as agricultural extension services, which might not typically reach individual farmers. These services are instrumental in introducing innovative farming techniques appropriate to the local context, further building the capacity of women farmers to adapt to changing climatic conditions.

Perhaps one of the most transformative aspects of cooperatives is their ability to amplify women's voices in community and policy discussions. Traditionally, women in rural areas like Zimba District have had limited representation in decision-making processes, whether at the household or community level. Cooperatives also allow women, through collective organization, to better interact with local leaders, government representatives, and NGOs. Such collective bargaining power enables them to raise their demands for credit access, training programs, and infrastructural improvements with one voice that is louder and clearer.

Moreover, cooperatives inspire in their members a sense of solidarity and mutual help, creating an environment where women can count on one another not only for practical help but also for emotional support. This social cohesion is particularly important during crisis periods, such as those characterized by prolonged droughts, when the mental and emotional burden for the individuals may be overwhelming. In fostering community-oriented approaches, cooperatives rebuild the social structures that have been disrupted by environmental stressors, strengthening the overall fabric of the community.

In the final analysis, cooperatives in Zimba District play a much more significant role than just economic benefits. Cooperatives are indeed a force for social transformation, through which women can transcend traditional constraints and build resilience against climate challenges, creating a basis for more equitable resource distribution and community development. This collective empowerment is important for addressing the systemic inequalities that make women particularly vulnerable to the impacts of drought.

5.5 Effectiveness of Adaptation Strategies

Crop diversification as shown in figure 2 of Chapter four, through the adoption of drought-resistant crops has been mentioned as one of the significant adaptive measures to deal with drought and water scarcity. However, evidence from Chapter Four reveals that this measure is insufficient for severe and prolonged droughts. Women farmers in Zimba District have noted that even these resilient crops fail under extended dry spells, exacerbating food insecurity and reducing household income. This limitation thus calls for

activities that would address environmental and infrastructural barriers, such as poor soil health and lack of irrigation systems.

Chapter Two identifies from the literature that crop diversification is not able to address the complete spectrum of climate impacts in its own right. It is part of a suite of combined approaches, involving crop diversification, for example, with water management techniques, such as rainwater harvesting, and soil conservation methods, such as mulching. These strategies, in concert with access to financial mechanisms, such as crop insurance and microcredit, ensure a more robust and sustainable framework of adaptation.

One of the clear adaptation strategies that had emerged in Chapter Four was the diversification of income. These are being pursued in small-scale trading, livestock rearing, and handicrafts, although these equally have problems relating to capitalization or accessing startup capital, access to market linkage, and even time commitment because of household and farming responsibilities.

This point is reiterated in Chapter Two, which puts forth that women-owned enterprises can gain greater avenues for profitability by being partnered with larger market networks. Microloans and other credit facilities designed for women farmers are part of resource gap filling which would provide them with capital to invest in the appropriate set of tools and resources needed to scale up their enterprise.

The formation of cooperatives, as indicated in Chapter Four, shows the importance of social capital and community networks in enhancing resilience. These groups allow resource sharing, knowledge sharing, and solving problems as a collective, which becomes very important during drought conditions. Women in Zimba District have been able to use such networks for communal pooling of agricultural resources, thereby reducing individual risks and enhancing community resilience.

As highlighted in Chapter Two, community-based approaches are extremely reliant on the technical and organizational capacity of their membership. Capacity-building

programs regarding advanced methods of agriculture, financial management and conflict resolution can be greatly enhanced with regard to effectiveness and productivity.

As noted in Chapter Four figure 8, the interventions by government agencies and NGOs involve training programs and drought-resistant seeds that are generally helpful but generally inadequate. They are also less effective for women farmers because such training programs do not usually capture most of their needs, which they have experienced for a very long time without real consistency.

Scholars in chapter two focuses on the collaboration of stakeholders. Improved coordination among government agencies, NGOs, and community-based organizations will avoid duplication and make sure that resources are being put to good use. This can link the local needs to the wider adaptation goals with greater effectiveness.

Participatory methods, as discussed in Chapter Four, are important in the direct involvement of women farmers in the design and implementation of adaptation programs. Their experiences and local knowledge accrued from lived realities provide important insights that secure interventions that are context specific and practical. Participatory approaches nurture ownership among beneficiaries for more sustainable and effective outcomes.

Respondent 17 explained that:

"As a famer in a community that has faced repeated droughts, and having been part of several initiatives that appraise the adaptation to such harsh conditions. Indeed, over the years, many women, including myself, have adopted a number of strategies to deal with the challenges brought on by climate change. While some of these strategies have been effective, others have presented limitations that make it clear we need more robust support and innovation.

Some of the major strategies put in place include shifting to drought-resistant crops such as millet, sorghum, and cassava. These have somewhat proved useful, with the thought that they survive with minimal rain unlike maize, which traditionally is our main staple crop. Though it is not easy changing over to the new crop. Drought-resistant crops are

always in low market demand compared to maize, and so, no matter how much we harvest of these crops, selling them at reasonable profits remains an uphill task. Besides, most of these other crops require knowledge in new techniques of planting and harvesting which most women in my community, including myself, have to discover through trial and error since formal training on the same is very limited.

One of the more innovative strategies we have tried is diversifying our income sources. Some women have started savings groups and small businesses, such as selling some groceries or rearing chickens or goats, to supplement their farming income. While this has helped many of us stabilize our households financially, it often means dividing our time between farming and other activities, which can be overwhelming. Moreover, these businesses also require initial capital and market access, which are not always available to everyone.

These strategies have helped us survive, though I wouldn't say they have solved our problems. They are mostly short-term coping mechanisms or here for survival, not long-term sustainable ones. For a correct judgment on their effectiveness, the impacts that they have on over time need to be seen. While I have seen that we manage drought conditions considerably better than a few years ago, the pace is slow, and the challenges we continue to face are growing in number and complexity faster than our capacity to adapt to them."

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

In Zimba, agriculture is the key livelihood activity with women playing a major role in sustaining household food security and economic stability. However, due to the rising intensities of these droughts, reduced agricultural productivity, food insecurity, and socio-economic instability have posed considerable challenges.

6.2 Conclusions

The findings of this study are important in addressing the challenges posed by droughts on women farmers in Zimba District. Based on the results and objectives of the study, this study offers practical insights and actionable recommendations.

6.2.1 Changes in Farming Practices Due to Droughts

The women farmers in Zimba District have demonstrated great resilience through practices of adaptation, such as crop diversification, adoption of drought-resistant crops, and changes in planting schedules. Yet, these adaptations are constrained by limited resource accessibility and agricultural extension services. Hence, the study emphasizes that targeted intervention should be able to facilitate improved training and increased access to resources and agricultural support systems so that women could continue farming during recurrent droughts.

6.2.2 Socio-economic Impacts of Droughts

The study has shown that droughts drastically reduce household income levels, increase food insecurity, and raise labor burdens that women once more bear disproportionately. These impacts, from a socio-economic point of view, have raised the urgent need for financial support, market access, and enhancement in the capacity of women for income diversification. This, in turn, reduces the vulnerability of women farmers and puts stability into economic situations in the drought-prone communities.

6.2.3 The Impacts of Drought on Society and Social Cohesion

Cooperatives and community-based approaches form the foundation for building resilience. Such networks can provide channels through which women may share resources and information as well as gain access to external aid. Strengthening such arrangements at the level of the community and linking these into expanded policies on development could also serve to build social cohesion and amplify women's voices within both local and national decision-making.

6.2.4 Efficiency in the Way Adaptation Strategies Work

While female farmers have indeed adopted various resourceful adaptation strategies like small-scale irrigation and income diversification, the efficacy is constrained by a set of structural and resource-related barriers. Indeed, the study recommends increased institutional support through microfinance availability, technical training, and sustained government and NGO interventions that could facilitate the scalability and sustainability of the strategies.

The present work addresses these objectives and defines a resilient, more equitable agricultural system in Zimba District, where women farmers are empowered to adapt effectively to the impacts of the climate challenge. The findings also give a road map to policy makers, development practitioners, and community leaders in the design of interventions that alleviate immediate effects of droughts while at the same time contributing to the long-term sustainability and equity in agriculture.

6.3 Recommendations

Ensuring Resilience of Women Farmers Increasing access to drought-resistant varieties of seeds, irrigation systems at affordable costs, agricultural implements, and other inputs requires the development of local level seed banks and subsidized farming gears. The enhancement of women's access to land through improved land tenure systems also empowers them to be invested in a set of more sustainable farming practices.

Capacity Building and Training: Appropriate training programs are needed, centered on the imparting of relevant knowledge and skills for modern farm technology adoption by

the female farmer. Training should first be given in conservation farming, soil management, and climate-smart agriculture. Extension services can be promoted to better ensure accessibility for rural women.

Diversification: Promoting income diversification through support for small-scale businesses and alternative livelihoods will reduce women farmers' dependence on crop production. Microfinance schemes and savings groups suited to women's needs would provide the much-needed capital for starting such ventures. The partnerships with local and international markets should also be established to ensure that the diversified products attract reasonable prices.

Strengthening Cooperatives: Women's cooperatives indeed play an important role in building resilience mechanisms. Financial support for capacity enhancement and infrastructure development will no doubt make them even more effective. Scaling up of successful practices of the cooperatives through collaboration of policymakers and development organizations, and providing a platform for collective advocacy, are what need to be done.

Enhancing Institutional Support: The government and other non-government organizations should work on designing and implementing policies sensitive to gender, covering the challenges unique to women farmers. That includes improving access to more grants and low-interest loans, better rural infrastructure, and higher access to markets. The programs will have to be focused on participatory approaches, where women farmers would be part of decision-making processes.

Community Resilience: Encourage the rebuilding and strengthening of traditional social systems; programs that help develop social cohesion, such as community-based management of water and food-sharing networks, for instance, improve collective resilience. Mental health support services should be introduced into community programs to support women in dealing with the psychosocial impacts of successive droughts.

Long-term impact trends and the effectiveness of drought adaptation strategies are in need of further research. It is now clear that only informed and evidence-based policy can

emerge after serious examination of the three areas involved: *gender, climate change, and agriculture.*

Timeframe of research activities

S/N	ACTIVITY	DATE
1	Submission of proposal	26th July 2024
2	Submission of proposal for ethical clearance	30th September 2024
3	Data collection	6th to 18th November 2024
4	Data analysis	19th to November to 6th December 2024
5	Compilation of dissertation	9th to 23rd December 2024
6	Submission of dissertation for examination	5TH January 2025

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APPENDIX A: (RESEARCH INSTRUMENTS)

Questionnaire for Women Farmers in Zimba District

Dear participant,

The purpose of this questionnaire is to gather information on the Impact of Droughts on Socio-Economic Status of women farmers in Zimba District. The information obtained from the respondents shall be treated with strict confidentiality and shall only be used for the purpose of this academic research. Your participation shall be highly appreciated.

Instructions

a) Your name is not required, your responses will be confidential and anonymous.

b) Kindly answer each question frankly and truthfully.

c) Where necessary, please elaborate on your answers.

Section 1: Demographic Information

1. Age: _____

2. Marital Status: [ ] Single [ ] Married [ ] Widowed [ ] Divorced

3. Education Level: [ ] No formal education [ ] Primary [ ] Secondary [ ] Tertiary

4. Number of dependents: _____

5. Years of farming experience: _____

Section 2: Agricultural Practices

6. What crops do you primarily cultivate? (Select all that apply)

[ ] Maize [ ] Sorghum [ ] Millet [ ] Cassava [ ] Other: _____

8. Have you changed your crop choices due to droughts?

[ ] Yes [ ] No If yes, please explain: _____

9. Which water-saving techniques do you use? (Select all that apply)

[ ] Mulching [ ] Drip irrigation [ ] Rainwater harvesting [ ] None [ ] Other: _____

10. How has your farming schedule changed due to droughts?_____

11. Has the frequency of droughts increased over the past 5 years?

[ ] Yes

[ ] No

12. How has drought affected your farming activities? (Select all that apply)

[ ] Reduced crop yields

[ ] Changed planting and harvesting times

[ ] Forced to change crops

[ ] Other (please specify): _____

Section 3: Socio-Economic Impact

13. How has the drought impacted your household income?

[ ] No impact

[ ] Slightly reduced

[ ] Significantly reduced

[ ] Severely reduced

14. Have you experienced food shortages due to droughts?

[ ] Yes

[ ] No

15. How has the drought impacted your ability to provide for your family?

[ ] No impact

[ ] Slight impact

[ ] Significant impact

[ ] Severe impact

16. How has the drought impacted you as a woman farmer?

[ ] Increase labour burden

[ ] Not really

Section 4: Community Dynamics

17. Has drought affected the social cohesion within your community?

[ ] Yes

[ ] No

If yes explain why_____

18. What do you think are the effects of drought on community dynamics?

[ ] Women have formed Cooperatives

[ ] Share knowledge

[ ] None

Section 5: Adaptation Strategies

19. What adaptation strategies have you adopted to cope with drought? (Select all that apply)

[ ] Planting drought-resistant crops

[ ] Water conservation methods (e.g., rainwater harvesting)

[ ] Small-scale irrigation

[ ] Diversifying income sources

[ ] Other (please specify): _____

20. Have you received any training on how to adapt to droughts?

[ ] Yes

[ ] No

If yes, who provided the training?

[ ] Government agencies

[ ] Non-governmental organizations (NGOs)

[ ] Community groups

Other (please specify): _____

21. What support would you need to better cope with drought in the future?

[ ] Financial assistance

[ ] Access to water-saving technologies

[ ] Better farming inputs

[ ] Training on modern farming techniques

[ ] Other (please specify): _____

FOCUS GROUP DISCUSSION (FGD) GUIDE

Dear participant,

I am a student at the University of Lusaka, pursuing a Masters in Development Studies. I am conducting research on the 'Impact of Droughts on Women's socio-Economic Status in Zimba District'. The information collected will be treated with the highest level of confidentiality and will be used for academic purposes only.

Instructions

A. Your name is not required; your responses will be confidential and anonymous.

B. Kindly answer each question frankly and truthfully.

C. Where necessary, please elaborate on your answers.

Section A: Agricultural Practices

1. Can you describe how droughts have changed the way you farm?
2. As a woman farmer, what specific challenges have you faced in maintaining your crops during droughts?
3. Have you adopted any new farming techniques or crop varieties to cope with droughts? If so, what are they and how effective have they been?
4. Have you had to change the crops you grow or the farming techniques you use because of the droughts?
    - ➢ What changes have you made, and why?
5. How do you feel the frequency and severity of droughts have changed over the years?
    - ➢ Do you feel that these changes are getting worse or more unpredictable?

Section B: Socio-Economic Status

4. How has drought affected your household's financial situation?
5. What has been the impact of drought on food security for your family?
6. Are there other sources of income you have turned to due to drought? Please elaborate.
7. Has anyone in your family had to leave the community or look for alternative income sources due to drought?
    - ➢ How has this affected your household dynamics?

Section C: Community Dynamics

7. How has the drought influenced the social structures and support systems in your community?
8. What role do community groups or cooperatives play in helping you as a woman cope with droughts?
9. Have you noticed any changes in community cohesion and mutual aid during times of drought?
10. Are you involved in any women's cooperatives or farming groups?
    - ➢ How have these groups helped you or your community cope with the challenges brought on by drought?

Section D: Adaptation Strategies

10. What strategies have you and other women in your community used to adapt to droughts?
11. How effective have these adaptation strategies been in improving your resilience to droughts?
12. What kind of support (e.g., financial, training, resources) do you believe would help you better manage the impacts of drought?

13. What role do you think the government, NGOs, or local leaders should play in supporting women farmers in drought-prone areas?

14. What advice would you give to other women farmers in similar situations to help them cope with droughts?

Thank you for your valuable input

APPENDIX B: CONSENT TO PARTICIPATE IN THIS STUDY

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