BINDURA UNIVERSITY OF SCIENCE EDUCATION

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FACULTY OF GEOGRAPHY

The Contribution Of Small Scale Crop Pruduction On Household Food Security In Ward 9, Mberengwa

BY

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B200017A

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF BACHELOR OF THE SCIENCE HONOURS DEGREE IN DEVELOPMENT STUDIES

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2024

APPROVAL FORM

The undersigned certify that they have read the dissertation and have approved its submission for marking confirming that it conforms to the departmental requirements on a research entitled: *"The contribution of small-scale crop production on household food security in Ward 9, Mberengwa rural, Zimbabwe*" Submitted by Richard Zhou in partial fulfilment of Bachelor of Science Honours Degree in Development studies.

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DECLARATION

I hereby declare that this thesis has been the result of my own original efforts and investigations and such work has not been presented elsewhere for the purpose of degree assessment. All additional sources of information have been acknowledged by means of references.

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DEDICATION

This research is dedicated to my parents. Thank you for showing the love and undying support I think I don't even deserve. I also dedicate this to my siblings who have been great to me in support. I love you to the core. Not forgetting my now-deceased sister Greatjoy Manenji who helped me with this dissertation but unfortunately could not see the final project (continue resting in peace sis).

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to the almighty God for His divine guidance and blessings that have sustained me throughout my academic journey. His grace has been my constant source of strength and inspiration.

I am also deeply thankful to my supervisor, Dr Musarandega, and my lecturer, Mr Gomo, for their unwavering support, guidance, and mentorship. Their expertise and encouragement have been instrumental in shaping my research and academic progress.

I would also like to express my heartfelt gratitude to my friends, Gamuchirai Garwe, Blessing Tambo, Takudzwa Mutangabende, Doncarlos Moyo, Peter, and Keith Livison, for their invaluable help, encouragement, and unwavering support. Their presence in my life has been a source of joy and inspiration, and I am truly blessed to have them by my side.

Lastly, I want to acknowledge my closest friend, Gamuchirai Garwe, for being my pillar of strength and unwavering support. Your friendship and love have been a precious gift, and I am forever grateful for your presence in my life. Thank you all for your endless help and blessings.

Abstract

This study investigates the intricate relationship between small-scale crop production and household food security in Ward 9, Mberengwa District, Zimbabwe, a region facing significant food security challenges due to factors such as climate change, limited government support, and inadequate access to resources. The research aims to shed light on the factors influencing food security outcomes for smallholder farmers in this context, specifically exploring how they navigate these challenges to ensure food availability, access, utilization, and stability. A mixed-methods approach was employed, combining quantitative and qualitative data collection techniques. Quantitative data on factors such as land size, crop diversity, input access, labor availability, market access, and income were collected through a structured questionnaire survey of a representative sample of smallholder farmers. Qualitative data on the subjective experiences, perceptions, challenges faced by these farmers were gathered through semi-structured interviews and focus group discussions. The quantitative data were analyzed using descriptive statistics and inferential tests, while qualitative data were analyzed using thematic analysis to identify recurring themes and patterns. The study revealed a complex interplay between small-scale crop production and household food security. While a significant number of farmers cultivate a wide variety of crops, contributing to dietary diversity, the study also highlighted critical challenges. A substantial proportion of farmers lacked access to government or non-governmental organization funding, limiting their ability to invest in inputs and technologies. Additionally, educational attainment, while generally positive, demonstrated a need for further agricultural training and extension services. Despite the importance of small-scale farming, food shortages persist, both occasionally and frequently in some households. Furthermore, limited market access, exacerbated by inadequate infrastructure, hindered smallholder farmers' ability to generate income and secure sustainable livelihoods. This study underscores the urgent need for targeted interventions that address the specific challenges faced by smallholder farmers in Ward 9. The findings highlight the importance of promoting sustainable agricultural practices, improving access to finance markets, investing in rural infrastructure to enhance food security and livelihoods for smallholder farmers. The study recommends promotion of land rights for women,targeted training and extension services, access to credit financial services, fair equitable input distribution, strengthening of women's voices in decision making, intergenarational knowledge transfer, youth engagement in agriculture, tailored support for older farmers, age specific training information, infrastructure

development, climate smart agriculture, market access and value chain development, collaboration and partnerships. By implementing these recommendations, policymakers, development agencies, other stakeholders can contribute to a more resilient equitable food system that empowers smallholder farmers and enhances food security in Ward 9, Mberengwa District, beyond.

Catalog

List of figures

1

1

LIST OF TABLES

List of photographs

List of abbreviation

AU	African Union
CAADP	Comprehensive Africa Agriculture Development Programme
CSA	Climate-Smart Agriculture
DAFF	Department of Agriculture, Forestry Fisheries
FAO	Food Agriculture Organization
GOZ	Government of Zimbabwe
IPCC	Inter-governmental Panel on Climate Change
NGOs	Non-Governmental Organizations
SADC	Southern Africa Development Community
SAPs	Sustainable Agricultural Practices
UNDP	United Nations Development Programme
ZIMSTAT	Zimbabwe National Statistics Agency

CHAPTER 1

INTRODUCTION

1.0 Chapter Introduction

This chapter focuses on the background of the study, research problem, research aim, research objectives and research questions. The chapter also goes on to outline the justification of the study as well as the definition of some key terms.

1.1Background of the study

Food security is a pressing global issue, with over 828 million people facing chronic hunger malnutrition (FAO, 2023). The United Nations' Sustainable Development Goal 2 emphasizes the need for sustainable agricultural practices to ensure food security for all (UN, 2015), but climate change exacerbates the challenge. Extreme weather events, like droughts, floods, directly impact crop yields food availability, creating vulnerability to food insecurity (IPCC, 2021). Scholars like Pretty et al. (2006) advocate for agroecological approaches, emphasizing ecological sustainability social equity in agricultural production, as a way to increase crop yields, promote biodiversity, enhance resilience to climate change. These practices are crucial for addressing the complex challenges of food security in the face of climate change.

Zimbabwe, like many developing countries, faces food security challenges. Despite its agricultural potential, factors like land degradation, climate change, economic instability have hindered food security (Moyo, 2009; Chitiga and Mhloyi, 2016). The Zimbabwean government has implemented various programs to improve food security, including agricultural input subsidies and drought relief programs (World Bank, 2016). However, the effectiveness of these programs remains limited due to corruption, political instability, inadequate resource allocation (Ndlovu Nyoni, 2017). This highlights the need for a more comprehensive locally tailored approach to addressing food security challenges in Zimbabwe.

Mberengwa District, located in the Midlands region of Zimbabwe, exemplifies the challenges of agro-ecological fragility. The region experiences recurrent droughts, erratic rainfall, limited access to water resources (Zinyengere et al., 2011; Muchadeyi et al., 2017). These factors negatively impact agricultural production, exacerbating food insecurity. Poverty, limited access to education, high unemployment further compound these challenges (Zimbabwe Vulnerability Assessment Committee, 2017). In this context, understanding the contribution of small-scale crop production to household food security becomes even more critical for developing effective interventions.

Ward 9, situated within Mberengwa rural, highlights the struggles of rural communities in achieving food security. The majority of the population are smallholder farmers who rely on rain-fed agriculture for their livelihoods (Moyo, 2009). The area's environmental conditions make crop production extremely challenging, limited access to resources like fertilizers, seeds, irrigation further restrict their ability to ensure food security (Giller et al., 2009). This specific context of Ward 9 provides a valuable case study for examining the interplay between small-scale crop production and household food security in a resource-constrained environment.

Despite these challenges, small-scale crop production remains a vital source of food income for households in Ward 9 (FAO, 2009). However, the contribution of this sector to household food security remains understudied.understanding the relationship between small-scale crop production household food security in Ward 9 is crucial for developing effective interventions to enhance food security resilience in this region. Scholars like Swinnen (2019) emphasize the importance of supporting smallholder farmers through policies that enhance their access to resources markets, thereby strengthening their capacity to produce food sustainably

.1.2 Statement of the problem

Recent scholars have highlighted the importance of small-scale agriculture in enhancing food security at the household level. Smallholder farmers are essential to the food supply chain for their families communities, especially in rural areas where resources markets are scarce. This is according to Smith et al. (2018). Similarly, Jones Brown (2019) emphasize that sustainable agricultural practices at the small scale can significantly improve food availability nutrition outcomes for vulnerable populations. Furthermore, Johnson (2020) argues that supporting small-

scale farmers through capacity building access to resources is essential for promoting food security lowering poverty in developing countries.

In recent years, there has been a growing interest in understanding the dynamics of small-scale crop production, its impact about the security of food in the home. Studies by Garcia et al. (2017) have shown that diversifying crop production among smallholder farmers can lead to improved dietary diversity resilience to climate change shocks. Additionally, Patel Lee (2019) suggest that empowering women farmers in small-scale agriculture can have positive effects on household food security outcomes. Moreover, Wang et al. (2021) highlight the importance of integrating traditional knowledge with modern agricultural techniques to enhance productivity and sustainability in small-scale farming systems.

Despite these insights, there remains a gap in the literature regarding the specific context of Ward 9, Mberengwa rural, Zimbabwe, concerning small-scale crop production household food security. This study aims to fill this gap by conducting a detailed investigation into the factors influencing crop production practices, their implications for food security outcomes in the target area. By exploring the experiences perspectives of smallholder farmers in Ward 9, this research seeks to provide valuable insights for policymakers, development practitioners, local communities interested in promoting sustainable agriculture and improving food security. While existing studies have addressed various aspects of food security, there is a lack of comprehensive research on the contribution of small-scale crop production to household food security in Ward 9, Mberengwa.

1.3 Justification of the Study

This is a crucial study that addresses the pressing issue of food security in rural communities. Small-scale crop production plays a significant role in ensuring food security for households in developing countries like Zimbabwe. In order to improve food security outcomes, this project is to investigate the effects of small-scale crop production on household food security in Ward 9, Mberengwa rural, Zimbabwe. It will provide insightful information that can guide policy interventions in agricultural practices.

Recent scholars have highlighted the importance of small-scale agriculture in enhancing food security at the household level. According to Smith et al. (2018), smallholder farmers contribute significantly to global food production. They play a vital role in ensuring food security for millions of people worldwide. In the context of Zimbabwe, Moyo and Nyathi (2019) emphasized the critical role of small-scale farmers in sustaining local food systems improving household food security. Their research underscores the need to support smallholder farmers through targeted interventions that enhance their productivity resilience.

Small scale crop production can end food insecurity in communal areas. Studies by Chikozho et al. (2020) have shown that small-scale crop production can have a transformative impact on household food security outcomes in rural communities. By diversifying crops adopting sustainable agricultural practices, smallholder farmers can increase their resilience to climate change, market fluctuations, thereby improving their access to nutritious food throughout the year. These findings underscore the potential of small-scale agriculture to address food insecurity challenges at the grassroots level.

In addition, recent also highlight the connection of small scale farming and household food security. A research by Ndlovu and Dube (2021) has highlighted the interconnectedness between small-scale crop production, household food security, poverty alleviation in rural settings. Their study demonstrates how investing in smallholder agriculture can not only improve food availability access but also contribute to broader socio-economic development goals by generating income opportunities for rural households. This evidence further supports the rationale for investigating the contribution of small-scale crop production to household food security in Ward 9, Mberengwa rural, Zimbabwe.

This research topic holds significant academic practical relevance due to its potential to generate valuable insights into the nexus between small-scale crop production household food security in a specific rural context like Ward 9, Mberengwa, Zimbabwe. This study was undertaken between November 2023 which is the start of the farming season in Mberengwa district up to the end of March which is the time for harvesting. Therefore, all the qualitative data carried out in the study is conclusive of the 2023 to 2024 farming harvesting season.

1.4 Aim

To investigate the impact of small scale crop production on household food security in Mberengwa rural district, ward 9.

1.5 Objectives

i. To identify food sources in Mberengwa rural district, ward 9
ii. To assess the food needs of households in ward 9
iii. To assess the current status of small-scale crop production in Mberengwa rural district, ward 9.
iv. To suggest ways to improve food security in Mberengwa.

1.6 Research Questions

i. What are the primary food sources available in Mberengwa rural district ward 9?
ii. How do household food needs vary based on family size composition in ward 9?
iii. What are the challenges faced by small-scale farmers in ward 9 regarding crop production?
iv. What strategies can be implemented to enhance food security in Mberengwa?

1.7 Definition of terms

Small-Scale Crop Production -Small-scale crop production refers to the cultivation of crops on a limited scale, typically by smallholder farmers or households, for subsistence or local market purposes (Baiphethi Jacobs (2009). It involves the planting, nurturing, harvesting of crops on a smaller area compared to commercial farming operations.

Smallholder farming-a kind of subsistence farming in which farms with fewer than 2 hectares of of cropland, a minimal asset base operate (World Bank Rural Development Strategy, 2003). They face systemic limitations, such as having less access to markets, technology, resources than other farmers in the industry, having a smaller resource endowment overall (Dixon et al., 2004).

Household Food Security- Household food security is the state where all members of a household have access to sufficient, safe, nutritious food to meet their dietary needs food preferences for an active healthy life. It encompasses both physical, economic access to food that is culturally acceptable (Coates et al (2007).

Rural Areas- Rural areas are geographical locations characterized by a low population density typically associated with agricultural activities as a primary source of livelihood for residents. These areas often lack urban amenities infrastructure found in urban centers (Juana and Mabugu (2005).

Mberengwa Rural District- Mberengwa Rural District is a specific administrative region within Zimbabwe characterized by its rural setting predominantly agrarian economy. It is known for its smallholder farming practices challenges related to food security in the region (Makate etal, 2016).

Wrad 9- Ward 9 refers to a specific sub-district administrative unit within Mberengwa Rural District in Zimbabwe. It represents a smaller division within the district where local governance community development initiatives may be focused (Mango et al, 2014).

1.8 Organisation of the study

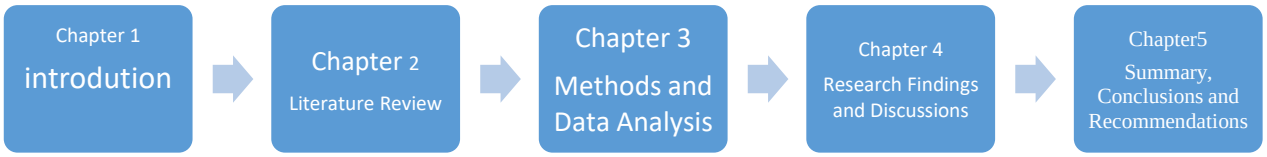


FIGURE 1.1: ORGANISATION OF STUDY

1.9 Chapter summary

This chapter comprises the research problem objectives. It provides an overview of the significance of small-scale crop production in enhancing household food security in rural areas like Ward 9, Mberengwa, Zimbabwe. The chapter delves into the background of the study, highlighting the challenges faced by households in accessing an adequate nutritious diet due to various factors such as limited resources and climate change. It outlines the research questions that will guide the study presents a brief outline of the subsequent chapter

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter explores the existing literature that is already available regarding small scale crop production household food security within rural areas. The literature review covered the scope of climate change on a national, regional, Africa and global perspective. The chapter aims at explaining the research questions objectives clearly exposing whether small scale crop production has improved food security.

2.1 Small scale farming

Due to its positive effects on household food security rural livelihoods, small-scale farming is essential to the global food supply. Those who produce small pieces of land with traditional methods minimal resources are known as small-scale farmers. FAO states that small-scale farmers are critical to global food safety because they produce more than 70% of the world's food supply (FAO, n.d.).

The potential of small-scale agriculture to advance sustainable agricultural methods is one of its main benefits. Small-scale farmers often employ agroecological methods that prioritize environmental conservation biodiversity. These practices help mitigate the negative impacts of industrial agriculture, such as soil degradation water pollution (Altieri, 2002). Additionally, small-scale farming promotes local food systems and reduces reliance on imported goods, contributing to food sovereignty resilience in the face of external shocks (Holt-Giménez Shattuck, 2011).

Notwithsting these advantages, small-scale farmers have many obstacles worldwide. Restricted availability of resources like loans, land, technology hinders their productivity competitiveness in the market. Climate change further exacerbates these challenges by increasing weather variability extreme events that threaten crop yields (De Schutter, 2010). In order to guarantee the durability and feasibility of small-scale farming globally, governments and international organizations must support legislative measures aimed at removing these obstacles.

2.1.1 Small scale farming (Africa perspective)

Small-scale farming is the foundation of agricultural output in Africa providing employment for millions of rural households supplying a significant portion of the continent’s food needs. According to the African Union Commission, over 80% of Africa’s agricultural output comes from smallholder farmers (AUC, n.d.). Africa's small-scale agricultural is typified by subsistence

farming, with farmers growing crops primarily for household consumption rather than commercial purposes.

The significance of small-scale farming in tackling food insecurity in Africa has been emphasized by recent research. According to Mutenje et al. (2016), smallholder farmers' diverse planting methods local expertise are vital to guaranteeing family food security. Similarly, Giller et al. (2011) emphasized the potential of smallholder agriculture to improve nutrition outcomes by promoting diverse diets based on locally grown foods.

Despite its significance, small-scale farming in Africa faces difficulties like land degradation, restricted market accessibility, inadequate infrastructure. The effects of climate change poses an additional threat to Africa's agricultural production, with changing rainfall patterns increased temperatures affecting crop yields (IPCC, 2014). To support smallholder farmers in Africa, policymakers must prioritize investments in rural infrastructure, extension services, climate-smart agriculture practices.

2.1.2 Small scale farming (Regional Perspective).

Small-scale farming is essential to providing food security reducing poverty in numerous global locations, including Asia and Latin America. For instance, smallholder farmers in Asia make up a sizable portion of the agricultural output and support rural development by creating jobs (Pingali Rosegrant, 1995). Similarly, in Latin America, small-scale farming supports local economies by providing nutritious foods preserving cultural traditions (Rosset Martinez-Torres, 2012).

Recent research has highlighted the potential of regional cooperation to increase small-scale farmers' resilience facing common issues including market volatility and climate change. By sharing best practices and technologies across borders, countries can strengthen their agricultural sectors improve food safety for vulnerable populations (FAO Regional Office for Asia Pacific).

2.1.3 Small scale farming (Zimbabwe Perspective)

In Zimbabwe, small-scale farming is a cornerstone of the country’s agricultural sector, with over two million households engaged in subsistence agriculture (Moyo et al., 2018). Smallholder farmers in Zimbabwe face various challenges such as land tenure insecurity due to historical inequalities in land distribution policies (Scoones et al., 2010). Despite these challenges, recent studies have underscored the importance of supporting smallholder farmers in Zimbabwe through

targeted interventions that address their specific needs. Chikazunga et al. (2020) emphasized Extension services' function in delivering technical assistance to smallholder farmers on farming methods that are sustainable. Within the field of food security studies, scholars have delved extensively into various aspects such as availability, accessibility, vulnerability and utilization of food resources across different regions. However, a critical analysis reveals that there is a significant gap in developing context-specific frameworks tailored to unique geographical, socio-economic settings, and available resources. This gap often leads to acute food shortages in many impoverished communities. As highlighted by Gillo (2017), recognizing how climate change affects food production is crucial for addressing these challenges effectively. The significance of farmers' knowledge of the consequences of the changing climate on agriculture and their coping tactics to lessen these effects is emphasized by Gillo's research.

Chitongo and Munyati (2017) shed light regarding the partnership between poverty eradication, livelihood outcomes, as well as food safety concerning irrigation schemes. Their analysis underscores the advantages of irrigation development regarding food accessibility in a specific case study area. By examining the changes in food safety indicators both prior to the implementation of an irrigation scheme, Chitongo and Munyati provide valuable insights into improving household food security by means of environmentally friendly farming methods. Andersen (2009) contributes to the discourse by exploring the definition and food security as measured at the home level. Andersen's work emphasizes the importance of considering vulnerability indicators access to essential resources like clean water sanitation in defining food security comprehensively. While Andersen's study provides a broad overview of food security concepts, it lacks specific case studies to contextualize these definitions effectively. This highlights the need for region-specific analysis to address diverse challenges related to food security measures.

2.2 Small-Scale Crop Production and Household Food Security

Small-scale crop production is crucial to maintaining household food safety, particularly where agriculture is practiced in rural places serves as the main source of income. According to Moyo et al. (2017), small-scale farmers in semi-arid regions heavily rely on crop production for sustenance due to erratic and unreliable rainfall patterns. In Zimbabwe, where a significant portion of agricultural land lies in arid and semi-arid regions, small-scale crop production becomes essential

for food security. Gebrehiwot, Mesfin and Nyseen (2015) emphasize that small-scale irrigation schemes are vital for enhancing agricultural productivity reducing dependency on unpredictable rainfall, thereby contributing to food security among rural households. The effectiveness of small-scale crop production in ensuring food security is evident in a variety of studies highlighting the importance of sustainable agricultural practices tailored to local conditions.

Within the framework of agricultural sustainability adaption to climate change, Chazovachii (2012) argues that small-scale crop production through irrigation serves as a critical mitigation means against droughts and mid-season dry spells, enabling farmers to intensify crop production throughout the year. By adopting climate-smart agricultural techniques, such as efficient water management diversified cropping systems, smallholder farmers can enhance their resilience help lessen climate change's impacts and enhance food security. Hussain and Hanjra (2014) further support this notion by emphasizing the multifaceted role of irrigation schemes in promoting food safety enhancing the standard of living for rural communities dependent on agriculture.

Traditional modes of irrigation, modernizing small-scale crop production systems can significantly boost productivity and contribute to household food security. IFAD (2006) highlights the transition from traditional shallow wells ponds to modern irrigation infrastructure utilizing water pump engines and sprinkler systems in Zimbabwean irrigation schemes. This shift towards modernization not only improves water efficiency but also enhances crop yields, thereby increasing food availability for rural households. FAO. (2013) underscore the importance of economic transactions facilitated by improved agricultural productivity through modernized irrigation schemes, leading to enhanced livelihoods and wealth creation within rural communities.

Community participation and collective management of small-scale crop production initiatives are also crucial for sustainable food security outcomes in rural areas. Swikepi (2011) emphasizes the significance of community involvement in enhancing food security measures by fostering local ownership and responsibility for agricultural activities. By engaging local stakeholders in processes of decision-making pertaining to crop production resource management, communities can ensure the sustainability of food security interventions tailored to their specific needs. Muzerengi and Mapuranga (2017) also stress the role of community-managed irrigation schemes in reducing farmers' vulnerability to climate variability enhancing overall food security within rural settings.

2.2.1 Traditional Farming Methods in Enhancing Food Security

A fundamental component of agricultural operations for a long time has been the adoption of traditional farming methods, particularly in rural areas where small-scale crop production is essential to maintaining family food security. These methods encompass a range of techniques and practices that are firmly ingrained in regional knowledge customs have been handed down through the years. According to Mazvimavi et al. (2016), traditional farming methods often involve manual labor, minimal external inputs, and reliance on natural resources for cultivation. Moyo et al. (2017) further emphasize that these methods are tailored to suit the local environment and are tailored to the particular requirements of smallholder farmers in rural settings. Therefore, the adaptation of agricultural methods to suit the local environment and to meet the unique requirements of smallholder farmers in rural settings is crucial for sustainable successful farming practices.

Traditional farming methods play a vital part in promoting biodiversity ecosystem services, thus strengthen agricultural systems' resilience. By maintaining diverse crop varieties, utilizing natural pest control methods, preserving and promoting soil health via techniques like inter-cropping and crop rotation, traditional farming practices contribute to sustainable agriculture and environmental conservation. Chazovachii (2012) also highlights that traditional farming methods are sustainable resilient to climatic variations, making them particularly relevant in regions prone to erratic rainfall patterns and droughts. These methods often incorporate indigenous practices such as intercropping, crop rotation, and water harvesting techniques that optimize land use efficiency and enhance soil fertility over time. Gebrehiwot et al. (2015) also point out that traditional farming methods promote biodiversity ecosystem services, enhancing the agricultural systems' overall resilience. Traditional farming methods play a vital part in promoting biodiversity ecosystem services, thus strengthen agricultural systems' resilience. By maintaining diverse crop varieties, applying organic pest management techniques, maintaining soil health with crop rotation inter-cropping, traditional farming practices contribute to sustainable agriculture environmental conservation.

Despite their inherent advantages, traditional farming methods face challenges in the modern context of agriculture. Muzerengi and Mapuranga (2017) argue that the rapid pace of technological advancement and commercialization of agriculture has marginalized traditional practices, leading

to a decline in their adoption among smallholder farmers. Christine et al. (2008) further note that restricted availability of financial resources, extended services, and markets hinders the scalability and productivity of traditional farming methods in meeting the food safety needs of rural households.

Given these difficulties, the necessity of using traditional farming practices is becoming increasingly apparent with modern agricultural techniques to enhance food security outcomes. Hussain and Hanjra (2014) advocate for a holistic approach that combines indigenous knowledge with scientific innovations to improve productivity while preserving cultural heritage. FAO (1996) also underscores the importance of promoting agroecological principles within traditional farming systems to ensure sustainable food production and environmental conservation.

2.2.1.1 Inter cropping

Inter cropping, a traditional farming method involving the simultaneous cultivation of two or more crops in proximity, is a practice that has been studied extensively for its potential benefits in enhancing agricultural productivity and food security. According to Willey (1979), inter cropping can result in more efficient l usage, improved soil fertility, pest control, and diversified food production. Hauggaard-Nielsen et al. (2001) further emphasize that inter-cropping systems can enhance resource utilization by exploiting complementarity between different plant species. Regarding the small-scale agricultural production in rural areas, inter-cropping holds promise as a strategy to maximize limited land resources while ensuring a more dependable varied food source.

However, the effectiveness of inter-cropping in improving household food security within the specific context of Mberengwa Rural District, Ward 9 remains underexplored. Altieri (1999) highlights the importance of understanding local agroecological conditions and farmer preferences when implementing intercropping systems to ensure their success. Moreover, Giller et al. (2006) stress the need for research that evaluates the socio-economic impacts of intercropping on smallholder farmers, including its contribution to income generation resilience to climate variability. Therefore, investigating the practice of intercropping within small-scale crop production systems in Mberengwa Rural District is crucial for addressing the research gap on effective food security measures.

2.2.1.2 Crop Rotation

In traditional farming methods, crop rotation is necessary to keep soil fertility, pest control, and overall crop productivity. Crop rotation involves planting different crops in a sequential order over time on the same plot of land. This procedure strengthens soil structure, breaks down the cycles of disease pests, increases nutrient availability for subsequent crops. According to Altieri (1998), traditional farming systems often rely on crop rotation as a sustainable agricultural practice that has been passed down through generations. Gliessman (2015) also emphasizes the importance of crop rotation in traditional agroecosystems for promoting biodiversity reducing the reliance on external inputs. Therefore, crop rotation plays a crucial role in traditional agroecosystems by enhancing biodiversity and decreasing the need for external inputs. Through the application of this technique, farmers can enhance soil health, reduce pest pressure, enhance overall sustainability in agricultural systems.

Crop rotation can also have positive implications for household food security by ensuring a more stable production of diverse crops throughout the year. Lal (2004) discusses how methods of sustainable land management, like crop rotation can lead to higher yields and better food availability for smallholder farmers. Mäder et al. (2002) conducted studies demonstrating that organic agricultural practices incorporating crop rotations had higher yields compared to monoculture systems over time, demonstrating the long-term benefits of diversified cropping practices. However, despite its benefits, the effective implementation of crop rotation in traditional farming methods may confront obstacles such as restricted knowledge transfer and the ability to access resources. Perfecto et al. (2009) point out that transitioning to sustainable agricultural practices like crop rotation requires adequate training and support mechanisms for farmers. Badgley et al. (2007) also raise concerns about the need for policy interventions to promote agroecological approaches including crop rotation among small-scale farmers facing food insecurity.

2.2.1.3 Agroforestry

Coexisting crops /or livestock with trees and other plants is known as agroforestry, which is a sustainable manner of land management. This practice has gained recognition for its potential to enhance food security, improve soil health, enhance biodiversity and offer additional sources providing revenue for rural small-scale farmers. According to Altieri (2010), agroecology, which

includes agroforestry practices, promotes agricultural resilience and sustainability by mimicking natural ecosystems. Agroforestry systems, which integrate trees and crops, can improve soil erosion, improve nutrient cycling, shade crops, all of which increase crop productivity and food safety.

In the process of pursuing sustainable agriculture practices, scholars like Altieri et al. (2017) also emphasize the importance of technological approaches rooted in agroecology for sustainable agriculture. Agroforestry aligns with this perspective by offering a holistic approach that considers ecological interactions within farming systems. The integration of trees in agricultural landscapes not only diversifies production but also improves ecological services including insect control pollination. This multifunctional aspect of agroforestry contributes to the overall resilience of farming systems against environmental stressors, ultimately supporting food security in the home.

The critical impact of resource constraints on exacerbating climate change's implications on agriculture, ultimately leading to compromised food security outcomes for rural communities, underscores the importance of innovative approaches such as agroecology. Aguilera et al. (2020) highlight the function of agroecology in reaction to climate change flexibility resource depletion, particularly in regions like rural Mberengwa district. Agroforestry practices within agroecological frameworks can aid in lessening the impacts of climate variability by improving soil water retention and lowering susceptibility to severe meteorological conditions. Within the framework of small-scale crop production in ward 9 of Mberengwa rural district, integrating agroforestry techniques could offer a long-term fix to enhance food security by diversifying agricultural outputs increasing resilience to changing environmental conditions.

The connection between resource constraints and food safety in the home is a complicated multifaceted issue. As discussed by Devereux (2009), resource scarcity can lead to vulnerability to food insecurity, especially in rural settings where households rely heavily on agricultural activities for their livelihoods. Inadequate entry to essential resources like fertilizers, irrigation systems, modern farming technologies can limit crop yields and jeopardize food availability within households. Additionally, research by Maxwell et al. (2019) emphasizes that resource constraints exacerbate climate change's implications on agriculture, further compromising food security outcomes for rural communities. Therefore, the critical impact of resource constraints on exacerbating climate change's implications on agriculture, is ultimately leading to compromised

food security outcomes for rural communities. Recognizing and resolving these issues is essential for sustainable farming methods ensuring food security for vulnerable populations.

The interplay between resource constraints and external factors such as market dynamics gives an additional degree of intricacy to the relationship between small-scale food security in households and crop productivity. Scholars like Reardon et al. (2014) have underscored the importance of market access for smallholder farmers in overcoming resource limitations improving food security outcomes. Limited access to markets due to poor infrastructure or lack of information can restrict farmers' ability to market their produce at reasonable costs, affecting their income levels and overall food safety status. Additionally, as highlighted by Pingali (2012), globalization trends and trade policies can either alleviate or exacerbate resource constraints faced by small-scale farmers, thereby influencing their capacity to ensure food security within their households. Therefore, the significant benefits of Farmer Field Schools (FFS) in enhancing crop yields small-scale farmers' access to food in poor countries.

2.2.1.4 Examples of successful small-scale crop production initiatives

In the global context, Initiatives for small-scale crop production have been successful in enhancing food security in rural areas. One notable example is the Farmer Field Schools (FFS) program implemented by the FAO. The FFS approach involves training farmers in sustainable agricultural practices, pest management, crop diversification. Investigation by Pretty et al. (2006) highlights the positive effects of FFS on improving crop yields as well as food safety among small-scale farmers in a number of developing nations. Therefore, the significant benefits of Farmer Field Schools (FFS) in enhancing crop yields as well as small-scale farmers' access to food in developing nations.

In Africa,the program Sasakawa-Global 2000 has been instrumental in promoting small-scale crop production for improved food security. This initiative, supported by the Sasakawa Africa Association, focuses on providing smallholder farmers with access to high-yielding seeds, fertilizers, and training in modern agricultural techniques. Studies by Jayne et al. (2010) have shown that the Sasakawa-Global 2000 program has significantly increased corn output as well as food security in the home in several African countries. The investigation completed by Jayne et al. (2010) highlights the positive impact of the Sasakawa-Global 2000 program on maize production and food security in households in various African nations. This underscores the significance of

agricultural development programs in addressing food insecurity and improving livelihoods in developing regions.

At a regional level, the CAADP has played a crucial role in supporting small-scale crop production initiatives across Africa. The CAADP seeks to reduce hunger and increase food supply through its Pillar III to boost agricultural productivity and promote sustainable farming practices. Research by Diao et al. (2012) underscores the importance of CAADP in enhancing food security through investments in smallholder agriculture. The research conducted by Diao et al. (2012) highlights the crucial function of the CAADP in improving food security by focusing on investments in smallholder agriculture. By emphasizing the significance of targeted investments policies in this sector, CAADP aims to enhance agricultural productivity, increase incomes for farmers with modest holdings, and ultimately help ensure food security in Africa.

In Zimbabwe, the government's Command Agriculture program has been successful in promoting small-scale crop production improving food security. This initiative provides farmers with inputs such as seeds, fertilizers, technical support to increase crop yields. Studies by Chisvo et al. (2018) have demonstrated the positive effects of Command Agriculture regarding food security maize output for households in Zimbabwe. The study conducted by Chisvo et al. (2018) highlights the noteworthy advantages of Command Agriculture on the production of maize and the security of food in households in Zimbabwe. This demonstrates the potential for targeted agricultural programs to strengthen livelihoods increase food security in developing countries.

2.3 Factors Influencing Small-Scale Crop Production

Small-scale crop production is essential to enhancing household food security, especially in remote regions where agriculture is a primary livelihood source. Understanding the factors that influence small-scale crop production is necessary in an effort to alleviate food insecurity challenges in these regions. This literature review focuses on exploring the various factors that impact small-scale crop production and the ramifications thereof for household food safety in Mberengwa rural district, specifically in ward 9. The research aims to close a gap in the body of current research by examining the effectiveness of food security measures implemented through small-scale crop production initiatives.

Small-scale irrigation schemes play a vital part in addressing climate-induced challenges such as droughts and unpredictable rainfall. Muzerengi and Mapuranga, (2017) highlight the importance of small-scale irrigation schemes in mitigating climate-induced challenges such as droughts and unpredictable rainfall. In regions like Mberengwa rural district where rainfall patterns are inconsistent, irrigation systems can provide a reliable water supply for crops throughout the year. By investigating the adoption and utilization of irrigation technologies, this review aims to assess how such interventions can positively impact crop productivity and household food safety.

The transformative effects of irrigation schemes on food safety livelihood improvement in rural communities has been a subject of scholarly inquiry. Scholars like (Hussain and Hanjra, 2014) underscore the multifaceted irrigation schemes' function in enhancing livelihoods fostering food security in rural communities. Factors such as access to technical skills, institutional support, as well as capacity building are critical to guarantee the success of small-scale irrigation initiatives. By examining these factors within the context of Mberengwa rural district, this review seeks to identify key determinants that influence small-scale crop yields as well as ultimately aid in the food security of the household.

In communal areas like ward 9 of Mberengwa rural district, smallholder farmers face various challenges that impact their crop productivity and overall food safety status. Factors such as land availability, soil fertility, entry to markets, climate variability, as well as pest management practices play a significant part in deciding the outcome of small-scale crop production initiatives. Understanding how these factors interact and influence food security outcomes is essential for designing effective interventions adapted to the particular requirements of the nearby farming communities.

Secure land tenure is necessary for ensuring food safety as well as lessening poverty as it provides individuals communities with the necessary stability resources to sustain themselves and improve their livelihoods. As highlighted by (Chikwati, 2018), successful examples of irrigation schemes like Chitora irrigation scheme demonstrate how strategic partnerships between government agencies and international development organizations can enhance food security, economic empowerment, and poverty reduction among rural populations. By examining similar case studies within Mberengwa rural district, this review aims to draw lessons on best practices for

implementing sustainable small-scale crop production projects that address food insecurity challenges at the household level.

2.3.1 Land access tenure

At a global level, land access and tenure systems play a pivotal role in shaping small-scale yield of crops. Scholars like Deininger and Byerlee (2011) have highlighted that secure land tenure rights are essential for smallholder farmers to make investments in their land, adopt sustainable agricultural practices, and improve productivity. Land snatching is frequently the result of insecure land tenure in developing nations, displacement of smallholder farmers, and reduced investments in agriculture (Deininger Byerlee, 2011). Additionally, global initiatives such as the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries, and Forests in the Context of National Food Security (FAO, 2012) emphasize the importance of stable land tenure for reducing poverty and ensuring food security. Secure land tenure is crucial for ensuring food security and reducing poverty as it provides individuals communities with the necessary stability resources to sustain themselves improve their livelihoods.

In Africa, land access tenure systems vary widely across countries regions, influencing small-scale crop production differently. Scholars like Jayne et al. (2016) have pointed out that land tenure insecurity is a common difficulty to smallholder farmers in many African countries, leading to low investment in agriculture limited access to credit. In contrast, countries like Rwanda have implemented land reforms that have improved land tenure security for smallholder farmers, resulting in increased agricultural security of food production (Ali et al., 2016). The AU's Framework Guidelines on Land Policy in Africa (African Union, 2009) advocate for secure land rights as a strategy to advance agricultural growth and rural livelihoods.

In the region of Southern Africa, land access tenure systems also significantly impact small-scale crop production. Researchers such as Chigumira et al. (2017) have highlighted the importance of customary land tenure systems prevalent in many Southern African countries, including Zimbabwe. Customary land tenure often influences smallholder farmers' access to land, decision-making power within communities, ability to invest in sustainable agricultural practices (Chigumira et al., 2017). Regional organizations like the SADC have recognized the requirement that address land tenure issues to promote agricultural development and food security in the region

(SADC, n.d.). Therefore, addressing land tenure issues is crucial for guaranteeing food safety and sustainable development in agriculture in the Southern African growth Community.

In Zimbabwe, land access tenure have been central issues shaping agricultural production for decades. The country's history of colonialism subsequent land reform programs have had profound impacts on small-scale crop production. Scholars like Moyo (2015) have documented how Zimbabwe's expedited land reform initiative resulted in significant changes in land ownership patterns but also raised concerns about agricultural output and tenure security. The government's implementation of various land policies programs has aimed to address historical inequalities in land distribution while promoting sustainable agriculture (Moyo, 2015). These land policies programs play a crucial role in not only rectifying past injustices but also ensuring the long-term viability of agricultural practices for future generations.

Zooming into Mberengwa District, specifically Ward 9, the dynamics of land access tenure directly influence small-scale crop production and household food security. Local studies by researchers such as Ndlovu et al. (2020) have shown that insecure land tenure arrangements in Mberengwa District have hindered smallholder farmers' ability to make long-term investments in agriculture. Restricted availability of extension and credit services further exacerbates the difficulties small-scale farmers in Ward 9 (Ndlovu et al., 2020). Understanding the specific context of Mberengwa District is crucial for formulating targeted interventions that enhance small-scale crop production and improve households' food security.

2.3.2 Availability access to agricultural inputs

At the global level, the accessibility of inputs for agriculture, such as fertilizers and seeds, equipment, have a noteworthy effect on small scale crop production (FAO, 2020). The Green Revolution in the mid-20th century, which saw the introduction of crop cultivars with higher yields and the increased use of agricultural inputs, led to significant growth in agricultural yield reductions in poverty and hunger (Conway and Toenniessen, 2003). However, numerous smallholder farmers, especially those in emerging nations, still lack access to these inputs because of things like poverty, limited infrastructure, and inadequate extension services (FAO, 2017). In contradiction to the sentiments of (FAO, 2020), Shiva, (2016) argues that the dependence on outside agricultural inputs, including fertilizers, seeds, and equipment actually undermines small-scale crop production leads to environmental degradation, and loss of biodiversity. Shiva, (2016)

advocates for a more sustainable agroecological approach to farming that prioritizes traditional farming practices and local seed varieties.This inability to access may lead to lower yields reduced food security for these farmers and their households.

From an African perspective, the issue of agricultural input access is particularly pressing. Despite the continent's significant agricultural potential, smallholder farmers in Africa often face numerous challenges in accessing necessary inputs (IFAD, 2019). These challenges include restricted means of payment, poor infrastructure, and difficulty obtaining credit insurance (World Bank, 2018). As a result, Africa has some of the lowest crop yields worldwide and food security remains a significant concern (FAO, 2018).The challenges faced by African agriculture are multifaceted and require comprehensive solutions to improve crop yields to guarantee food safety for the expanding population of the continent.

Regional variations in agricultural input availability and access also exist within Africa. For example, in West Africa, there have been attempts to improve access to agricultural inputs through programs such as the West Africa Fertilizer Initiative (WAFI) (AUC/NEPAD, 2017). However, progress has been uneven, and many smallholder farmers still lack access to necessary inputs (IFAD, 2019). In contrast, nations like South Africa have made significant strides in increasing agricultural input availability access through policies such as subsidies input voucher programs (DAFF, 2018).Overall, these efforts have engaged in a vital role in enhancing the productivity and sustainability of Africa's agriculture industry.

Turning to Zimbabwe specifically, the country has faced significant challenges in recent years related to agricultural input availability access. The economic crisis of the last two decades has led to the decline investment in agriculture and limited availability of inputs such as fertilizers seeds (GOZ, 2019). Additionally, smallholder farmers often lack credit access and insurance necessary to purchase these inputs (ZimVac, 2018). As a result, crop yields have declined significantly in recent years (FAO/WFP/GPC, 2019).This decline in crop yields presents a serious risk to agricultural sustainability and global food security, highlighting the urgent need for effective solutions to address this pressing issue.

At the local level of Mberengwa district's Ward 9 specifically, the issue of agricultural input availability access is particularly pressing. Many smallholder farmers in this region lack access to necessary inputs because of things like poverty and limited infrastructure (ZimVac, 2018). As a

result, crop yields are often low, which can impact food security for these farmers and their households (GOZ/UNICEF/WFP/FAO et al., 2019). Interventions aimed at increasing agricultural input availability and access in this region could have significant effects on the production of small-scale crops and household food safety.

2.3.3 Climate weather patterns

Climate and weather patterns possess a noteworthy impact on small-scale crop production at the global level. According to IPCC (2014), climate change's effects on agricultural productivity through changes in temperature, precipitation, and extreme weather events. These changes directly impact crop growth, development, and yield, has detrimental effects on food security (IPCC, 2014). Furthermore, according to FAO (2016), climate extremes and variability are major contributors to the volatility of food prices globally, which has a result on the livelihoods of modest farmers and food security. Therefore climate variability and extremes are significant factors contributing to global food price volatility, having an effect on small-scale farmers' livelihoods food security across the globe.

The weakness of very modest agricultural production in Africa to the climate change effects have sparked worries about future food security of the continent. In Africa, climate change has been identified as a significant threat to small-scale crop yield and food safety (Thorpe et al., 2018). The continent is extremely susceptible to climate variability extremes because of its reliance on rain-fed agriculture (Thorpe et al., 2018). Because of the changing climate, there has been elevated temperatures, altered patterns of precipitation, a rise in the occurrence and intensity of severe weather like floods and droughts (Thorpe et al., 2018). These changes have negatively affected crop yields, reduced agricultural productivity, increased food insecurity (Thorpe et al., 2018).The effects of climate change have included various detrimental impacts on agriculture, including reduced crop yields, decreased agricultural productivity, and heightened food insecurity. These changes have presented serious obstacles to global food systems and the means of subsistence for millions of people worldwide.

The consequences of global warming are being keenly felt across Southern Africa, with countries like Zimbabwe experiencing significant shifts in weather patterns that are impacting various sectors, including agriculture. In Southern Africa, including Zimbabwe, changes in climate have led to decreased rainfall, higher frequencies and temperatures increasing severity of severe weather

phenomena like floods and droughts (Chikodzi Shizha, 2019). These changes have negatively affected small-scale crop production in the region (Chikodzi Shizha, 2019). According to Chikodzi Shizha (2019), small-scale farmers in Southern Africa have reported decreased crop yields due to climate change impacts. They have also reported increased input costs due to the need for irrigation and other adaptation measures (Chikodzi Shizha, 2019). Increased input costs due to the need for irrigation and other adaptation measures can pose significant challenges for agricultural producers, impacting their overall profitability sustainability in the long run.

The adverse climate change's effects on agricultural practices in Zimbabwe have become increasingly evident in recent years, posing significant challenges to small-scale crop production in the region. In Zimbabwe, climate change has significantly affected small-scale crop production (Masvaya et al., 2017). The country has experienced decreased rainfall, increased temperatures, increased frequency and intensity of extreme weather events such as droughts and floods (Masvaya et al., 2017). These changes have resulted in decreased crop yields and increased food insecurity (Masvaya et al., 2017). According to Masvaya et al. (2017), small-scale farmers in Zimbabwe have reported using various adaptation measures such as conservation agriculture, agroforestry, and irrigation to cope with climate change impacts. However, these measures require significant investment costs that many small-scale farmers cannot afford (Masvaya et al., 2017). Despite the challenges faced by small-scale farmers in implementing sustainable agricultural practices, it is crucial to find ways to support them in adopting these methods for the long-term benefit of both the environment and their livelihoods.

2.3.4 Market access prices

The interconnectedness of global markets plays a pivotal role in shaping the landscape of small-scale crop production worldwide. At the global level, market forces such as demand, supply, and price dynamics significantly impact small-scale crop production (FAO, 2018). According to the FAO, global food markets are becoming increasingly integrated, which exposes small-scale farmers to volatile price fluctuations. As a result, these farmers must adapt their production strategies to respond to changing market conditions to ensure their food security and economic sustainability (FAO, 2018). The ability of farmers to adapt to evolving market conditions is crucial for maintaining food security and economic sustainability in agricultural communities.

In Africa, market forces have played a significant role in shaping small-scale crop production. For instance, the liberalization of agricultural markets in the 1980s and 1990s led to increased competition among farmers, affecting their productivity and profitability (World Bank, 2015). Moreover, African small-scale farmers are vulnerable to external shocks such as climate change and political instability, which further exacerbate market volatility (Ellis and Freeman, 2004). Therefore,understanding the impact of market forces on small-scale crop production is critical for improving food security in rural Africa.

In the context of small-scale crop production in rural areas of Mberengwa District, Ward 9, Zimbabwe, market access and prices play a crucial role in influencing the decisions outcomes of smallholder farmers. According to Barrett et al. (2001), market access refers to the ability of farmers to connect with markets where they can sell their produce. In many rural areas, limited infrastructure such as poor roads and lack of transportation facilities can hinder farmers' access to markets, leading to reduced opportunities for selling their crops at favorable prices. This lack of market access can result in small-scale farmers being forced to sell their produce at lower prices or incur high transportation costs to reach distant markets.

In Zimbabwe, the agricultural sector has faced various challenges over the years, impacting small-scale crop production and food safety. According to Chisvo et al. (2018), factors such as unstable macroeconomic conditions, inadequate agricultural policies, and limited access to credit have affected smallholder farmers' ability to produce crops efficiently profitably. Market access issues further exacerbate these challenges, as highlighted by Mutenje et al. (2013), who emphasized that limited access to markets leads to price uncertainty for small-scale farmers, affecting their income and overall food security.

Zooming into Mberengwa District, Ward 9, specific local dynamics come into play when considering market access and prices in relation to small-scale crop production. According to Moyo et al. (2016), the topography of Mberengwa, characterized by rugged terrain limited infrastructure, poses significant challenges for farmers in accessing markets for their produce. This geographical isolation can result in higher transaction costs for farmers, reducing their competitiveness in the market and affecting the prices they receive for their crops. Additionally, local market structures and middlemen practices can further impact smallholder farmers' ability to negotiate fair prices for their produce.

2.4 Food Security Pillars

During the 1996 World Food Summit, the Committee on World Food Security defined food security as: CFS (2012) defines food security as having access to enough wholesome food that is safe to match dietary needs choices for a healthy lifestyle.

Understanding the various components of food security is essential in addressing the complexities of ensuring that everyone has access to wholesome meals and households. Food security pillars, Consider factors including stability, use, availability, accessibility in addition to seed security (FAO, 2008; Capone et al., 2014). According to Pinstrup-ersen (2009:5), national global food security focuses in the equation's supply side. According to Weingärtner (2004), food availability in homes and on an individual basis refers to the physical availability of food, whether produced at home or purchased from the market. Therefore, household individual food accessibility pertains to the tangible presence of food within a household or accessible to an individual, whether it is sourced from home production or acquired through market transactions.

This research focused on smallholder farmers' households, rather than national food availability via regional production, imports, and food assistance, or local food storage. Food availability indicators include adequate dietary and protein supplies, as well as farming output indicators (Pangaribowo et al., 2013). The capacity of farmers to adapt to evolving market conditions is crucial for preserving food security and economic sustainability in agricultural communities. It requires a combination of knowledge, skills, resources, support systems to navigate the dynamic landscape of agricultural markets effectively.

The issue of food security is multifaceted and encompasses various dimensions that impact individuals communities on a daily basis. According to Capone et al. (2014) SADC (2014), food access occurs when homes and people have the resources to obtain nutritious food production, acquisition, or gift. Food availability encompasses both material and financial access (Sharma, 1992). According to Sharma (1992), vulnerable households should possess food availability, either through self-production or market purchases. According to Sen (1981) Sharma (1992), economic access requires the ability to acquire food. According to Leach et al. (1999), Ribot and Peluso (2003), access is shaped by establishments at various levels, including national property laws, local forest access guidelines, and intra-household gender relations. According to Leach et al. (1999) Ribot and Peluso (2003), institutions shape access in different ways. such as local forest access

policies, federal property rules, as well as gender relations inside households. Food availability, like seed availability, does not guarantee access (FAO 2008). According to Weingärtner (2004), adequate food availability can be provided even if households do not produce their own food. Indicators of food accessibility include pricing, earnings as well as social services (Pangaribowo et al., 2013).Food accessibility is crucial in ensuring that individuals have the means to obtain and consume an adequate amount of food for their well-being. Factors such as pricing, income levels, and access to social services play a significant role in determining the accessibility of food for domestic usage. Therefore, while food availability is important, it is equally important to address matters pertaining to food accessibility to ensure that all individuals have the ability to acquire the necessary food for a long healthy life.

The importance of proper nutrition cannot be overstated in maintaining a healthy lifestyle. The use of food by the human body is referred as capacity to consume digest food. SADC (2014) recommends that food be both nutritious and safe to consume. Food utilisation refers to household members' ability to sustain themselves with available food. According to Barrett (2010: 825), food utilization takes into account nutritional composition, individual health status, food safety, preparation, and sanitation. Household members' micronutrient intake absorption can be measured based on their food as well as anthropometric results (Pangaribowo et al., 2013). Weingärtner (2004) defines sustainability as the time on a facet of food safety. According to Capone et al. (2014), sustainability encompasses all dimensions of food security, including accessibility, usability, availability across time. The FAO (2008) found two different forms of food insecurity: both long-term and short-term. When there is ongoing food insecurity, individuals are not able to satisfy their hunger for a protracted period due to structural factors as destitution and a lack of resources. According to Maxwell Smith (2016), The term "chronic food insecurity" describes the incapacity to meet household food needs on a consistent basis. Indices of food safety were utilized to evaluate the level of food security of Mberengwa, district ward 9 families.

2.4.1. The State of Food Security in Zimbabwe

Food security in Zimbabwe remains a critical issue, with many facing obstacles in getting enough food that is safe and nourishing. Despite efforts to improve the situation, elements like unstable economies and climate change continue to impact food availability affordability in the country. Understanding the current state of food safety in Zimbabwe is crucial for developing effective

strategies to ensure all its citizens have access to an adequate diet. This sub-topic explores the complexities of food security in Zimbabwe and highlights the main problems that require attention.

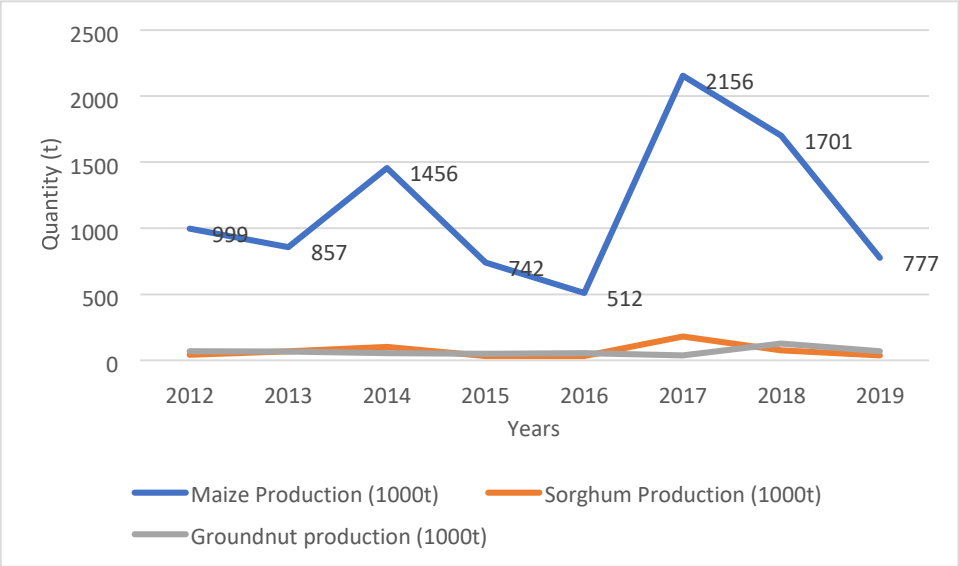
2.4.1.1. Contribution of agriculture to GDP

The amount that Zimbabwe's agricultural sector contributes to its GDP has experienced a notable decline in recent years, with statistics indicating a decrease from 15-18% prior to 2012 to 7.19% in more recent times. Zimstats (2022) as of 2012, agriculture's contribution to Zimbabwe's GDP was 7.19 percent. Zimstats (2019) said that agriculture contributed 9.9% of GDP between 2012 2016. Prior to 2012, it comprised 15–18% of Zimbabwe's GDP (GOZ, 2012). Agriculture employed one-third of Zimbabwe's formal labor force and provided a living for around 70% of the population (GOZ, 2012).The economic expansion of Zimbabwe was mostly driven by its agriculture sector.

2.4.1.2. Agricultural output productivity

Zimbabwe's principal economic expansion of goods include tobacco, cotton, sugar, maize horticulture crops, livestock,wheat, groundnuts, chicken, fish, and soybeans. Zimbabwe's food output has not increased to levels of subsistence since 2000 (Mudzonga and Chigwada, 2009). Low productivity is the most significant concern facing Zimbabwe's agriculture sector. The country's top six food crops are finger millet, pearl millet, sorghum, maize, groundnuts, wheat (GOZ, 2012). According to MLAWCRR (2019), the country requires 1.75 million metric tons of cereal for human consumption around 350,000 metric tons for animal production. The country's cereal needs have only been satisfied once since 2012, in 2017 (see to Figure 2.1). Government dependence on imports has been necessary in the majority of years. Despite being the basic national meal, maize production has declined over the years as shown in Figure 2.1 which contrasts groundnut and sorghum, another cereal, a legume, throughout time. Maize output varies more than groundnuts and sorghum due to weather factors and price limitations. Low production years coincided with the country's droughts. Maize output varies more than sorghum and groundnuts due to weather factors and price limitations. Low production years coincided with the country's droughts. Droughts in 2011/2012 2015/2016 severely impacted agricultural production during the last decade. In both circumstances, the government needed to import cereals from neighboring nations (Zimstats, 2019).These events highlight the vulnerability of Zimbabwe's food system to

climate-related shocks and emphasize the importance of building resilience and implementing sustainable agricultural practices to ensure food security in the future.



Source: Adapted from indexmundi.com

FIGURE 2.1: CROP OUTPUT TRENDS IN ZIMBABWE BETWEEN 2012 2019.

In recent times, Zimbabwe's agriculture industry has encountered noteworthy obstacles in productivity. The average national agricultural yields since 2012 have been below 1,000 kg/ha, with the exception of soya (Zimstat 2019). The agricultural sector has faced challenges like a deficiency in inputs, high costs, controlled prices, lack of finance, government neglect, declining land quality and droughts that come back (Zimstats, 2019; Mazarura et al., 2019; Mudzonga and Chigwada, 2009).The challenges faced by the agricultural sector, including absence of inputs, excessive expenses, price controls, insufficient funding, disregard from the government, declining land condition, and recurring droughts, have significantly impacted the industry's sustainability productivity.

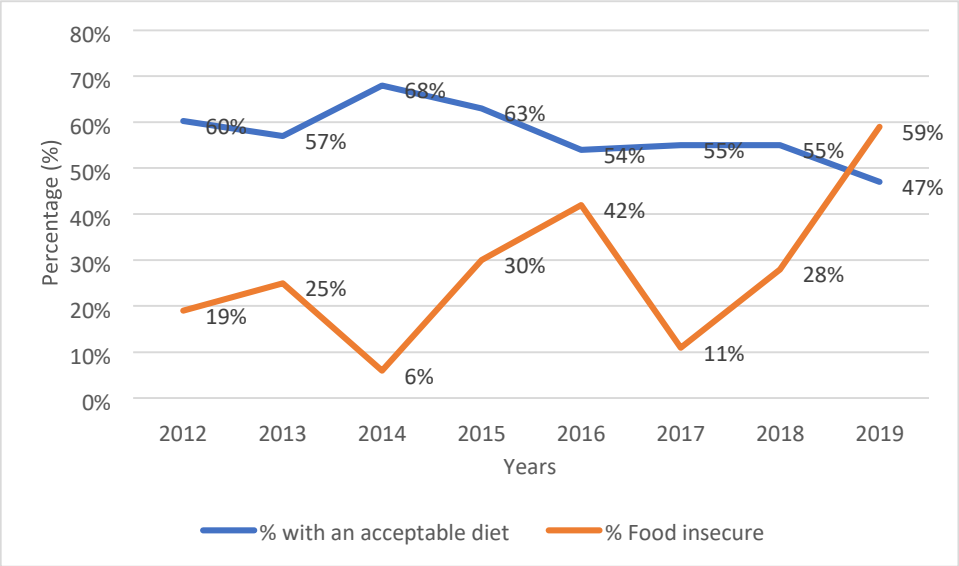
2.4.1.3. Measurements for food security

Zimbabwe uses two key metrics to evaluate food safety in rural areas: percentage of families experiencing food consumption index and food insecurity. The food consumption score (FCS) assesses dietary variety, regularity, nutritional worth of the food kinds that households eat (2010)

Kennedy et al.; WFP, 2008). The World Food Programme categorizes households into three categories based on their food consumption scores:inadequate, ambiguous, and appropriate (WFP 2008). According to ZIMVAC (2019), households with adequate food consumption scores are considered to have access to food, whereas those with borderline or bad consumption levels are lower so it is essential for policymakers and organizations to address the factors contributing to inadequate food consumption to ensure food security for every person and every community.

The World Food Programme categorizes households into three categories based on their food consumption scores: inadequate, ambiguous, and appropriate (WFP 2008). According to ZIMVAC (2019), households with adequate food consumption scores are considered to be in a safe food supply, but individuals who consume food seldom or poorly are not. Households are considered food secure if their potential energy intake exceeds their basic requirements. The household was labeled as food insecure while the opposite was true.

Figure 2.2 compares food consumption scores (based on an appropriate nutrition during the season of famine) with food insecurity rates from 2012 to 2019. The line for food insecurity was erratic, indicating that many Zimbabwean households had significant levels of food insecurity, particularly during the worst years of 2015, 2016, and 2019. During this period, agricultural production was low, particularly for maize, as seen in Figure 2.2.



Source of data: ZIMVAC Reports 2012-2019

FIGURE 2.2: PERCENTAGE OF ZIMBABWEAN HOUSEHOLDS WITH FOOD INSECURITY COMPARED TO THOSE WITH A SUITABLE DIET

While the line showing the percentage of homes that were food insecure was high, erratic, the chart displaying the proportion of homes adhering to a healthy diet remained stable between 54% 68%. This demonstrates the significance of taking into account the nutrition, dietary diversity, frequency of the many foods that households had access to in addition to the staple grain maize, as doing so gives a more comprehensive picture.

2.4.1.4 Determinants of Food Security

More than 820 million people, according to the 2019 FAO State of Food and Nutrition Security Report, around the world suffer from hunger. According to FAO et al. (2019), around two billion people worldwide face food insecurity: mild to severe. Hunger is on the rise throughout Africa, Latin America, and Western Asia to varying degrees. The research identifies a variety of factors contributing to significant food insecurity, which encompasses economic downturns, conflict instability, population displacement, climate change.

Research indicates that the primary factor causing food insecurity is a variety of factors, including natural disasters, societal issues, climate change, political and economic instability (Deaton Lipka 2015; Israel and Briones 2012; FAO et al., 2019; Popp et al. 2019; Wheeler von Braun 2013). Academics have argued that a "socio-ecological niche framework" should be used to comprehend the ways in which the natural ecosystem smallholder farmers' access to food (Lescourret et al., 2015; Nkurunziza et al., 2020; Ojiem et al., 2006). Ojiem et al. (2006) define the socio-ecological niche as a multidimensional ecosystem that encompasses the sociocultural, economic, ecological, agro-ecological components, allowing for analysis of seed systems food access.

Agricultural practices are deeply influenced by the agro-ecological parameters present in a specific region, shaping the types of crops that can be successfully cultivated by farmers. According to Ojiem et al. (2006), agro-ecological parameters like the volume of precipitation, the temperature, soil type, solar exposure, have a direct impact on the crop varieties available to farmers in a given location. Farmers' compatibility with crop varieties and food is influenced by socio-cultural elements such as values, conventions, tastes, and interpersonal relationships. These factors effect crop production, including yields labor, as well as output markets, that support farmers' financial

availability of food and seeds. The final component of the Ojiem et al. (2006) concept model comprises availability of food and seeds, including nutrients, soil moisture, microorganisms, diseases, pests, and weeds. These affect crop production metrics like yields, as well as labor output markets that support farmers' financial access to food seed.

Understanding the intricate interplay between local ecological factors and creating sustainable food production systems requires a high level of productivity in agriculture in enhancing food safety. The final component of the Ojiem et al. (2006) concept model comprises local ecological elements, including soil moisture, nutrients, microorganisms, pests, diseases, and weeds. These affect yields and other aspects of agricultural production performance. In Zimbabwe, food security determinants research revealed a prevalence of 51.3% under-nourishment and 27.1% stunted growth. Food insecurity is primarily caused by economic shocks (for example, devaluation of currency, rising food prices, and lack of job prospects) stressors associated with the climate (for example,inadequate rainfall, heat waves, and drought) (FAO, 2019). These determinants may not apply to all households or always correlate positively with food security. Increased household size can benefit some households by allowing for more people to farm the land and generate greater revenue. Large household sizes, particularly among the poor, can lead to food insecurity due to the need to feed multiple mouths. To fully understand food security, it's crucial to take into account the specific area household types under investigation. This was done to help Mberengwa households recognize the limitations on their food security given the circumstances.

2.5 Chapter conclusion

Whilst this is understood about small scale farming, what is not know is whether small scale farmers are meeting household food security in ward 9, Mberengwa this is the reason why this study is being undertaken in this particular area.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The dissertation's methodology section on the contribution of small-scale crop production to the households' food safety in rural parts of Mberengwa Rural District, Ward 9 will go over the steps involved in data analysis, sample plans, data gathering techniques, and research design. This section will detail how primary data will be collected through surveys or conversations with tiny-scale farmers in the specified area. It will also explain the approach to analyzing the data gathered to draw conclusions regarding the impact of small-scale crop production to the food security of households. Additionally, the methodology will address any limitations or challenges faced during the research process and how they were mitigated to ensure the correctness and dependability of the research results.

3.2 Description of the study area

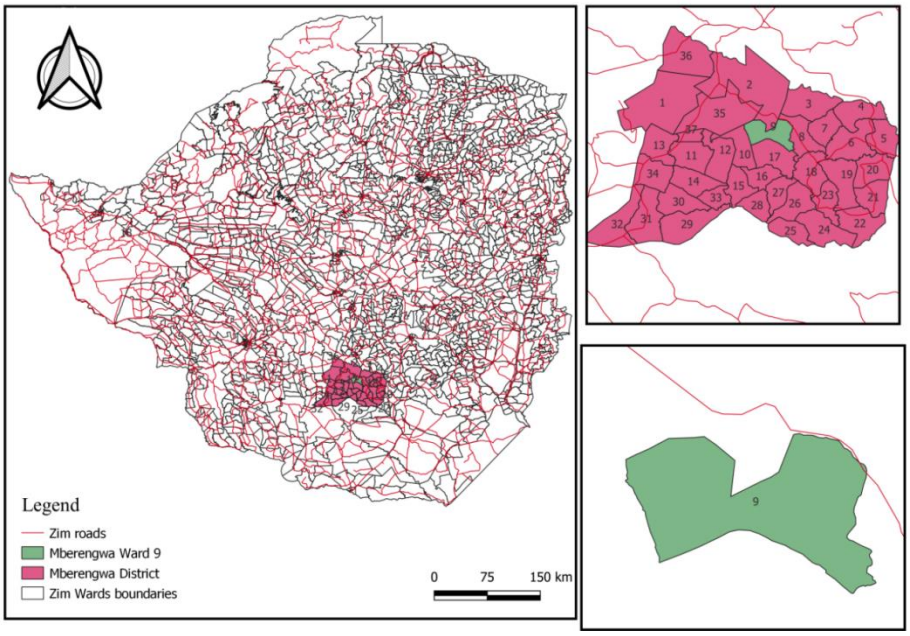


FIGURE 3.1: MAP SHOWING WARD 9 OF MBERENGWA

Ward 9 is situated in the southeastern part of Mberengwa district, Zimbabwe. It is located at grid coordinates X: 20.3278, Y: -19.0035. The ward covers an area of approximately 150 square kilometers and is characterized by a mix of flat plains and hilly terrain. The region experiences a

subtropical climate with distinct wet and dry seasons, making it suitable for agricultural activities. As per the most recent information from the Zimbabwe National Statistics Agency (ZIMSTAT), the population of Ward 9 in 2022 is estimated to be 12,000 individuals. Of this population, 48% are male 52% are female. The community in Ward 9 is predominantly engaged in small-scale crop production, with maize, sorghum, and groundnuts being the primary crops grown for subsistence and sale. The physical environment of Ward 9 is characterized by fertile soils, predominantly sandy and loam, which are suitable for crop cultivation. The region is dotted with small rivers and streams that provide water for irrigation throughout the arid season. The landscape is also marked by scattered woodlands and shrub vegetation, providing natural resources for fuel and construction materials.

Mberengwa rural district is situated in Zimbabwe, a landlocked country located in southern Africa. The district is characterized by its rural setting, with the majority of people's main source of income coming from agriculture. According to Mavhura and Manjengwa (2017), Zimbabwe has a history of agricultural productivity challenges because of things like land reform policies, climate change, and economic instability. The district is situated in Zimbabwe's Midlands Province and covers a total land area of approximately 4,500 square kilometers (Mavhura and Manjengwa, 2017). The topography of the region is predominantly characterized by hills and valleys, which can influence agricultural practices and crop yields. According to Chikozho et al. (2018), the terrain in rural Zimbabwe can pose challenges to small-scale farming in terms of soil erosion and water management. Socially, Mberengwa rural district is home to a diverse population consisting mainly of subsistence farmers who rely on small-scale crop production for their livelihoods. The community in ward 9 faces various social difficulties like restricted entry to resources, inadequate infrastructure, and high levels of poverty (Mavhura and Manjengwa, 2017). These social factors can impact household food security and are crucial considerations for the research study. Politically, Zimbabwe has experienced significant political changes over the years that have influenced agricultural policies and practices. The land reform program implemented in the early 2000s resulted in widespread land redistribution, affecting small-scale farmers in rural areas like Mberengwa district (Mavhura and Manjengwa, 2017). Political stability or instability may affect the production of agriculture and food security within the study area. Ethical considerations are paramount when conducting research involving human subjects, especially in susceptible groups like those who reside in rural locations facing food insecurity. Informed consent must be obtained

from participants involved in the study, making sure they comprehend the goal of the study and their rights as participants (Chikozho et al., 2018). Maintaining anonymity and confidentiality is also important to safeguard the privacy of individuals sharing their experiences related to household food security.

Legal considerations may include compliance with local regulations regarding research activities conducted within Zimbabwe. Researchers must adhere to ethical guidelines set forth by institutional review boards or relevant authorities to ensure that the study is conducted ethically and legally (Mavhura and Manjengwa, 2017). Additionally, researchers should consider any potential risks or harm that participants may face due to their participation in the research take measures to mitigate these risks.

3.3 Methodology

To investigate the part played by small-scale farming to food safety in rural regions of Mberengwa district, Ward 9, a mixed-methods approach were employed. Both quantitative and qualitative data were used in this investigation to offer an extensive understanding of the research questions. The general goals of confirmation or breadth and depth of comprehension were the reasons behind this (Johnson and Schoonenboom, 2017). Quantitative approach was used to compliment the qualitative approach. Under quantitative approach, household surveys which are structured questionnaires were administered to a sample of households in Ward 9 to collect data on crop production, food consumption patterns, income sources, and other relevant variables. Crop yield assessments which are also field assessments were conducted to measure crop yields from small-scale farms in the study area, providing insights into the productivity of different crops.

When qualitative data was being collected, interviews with key stakeholders such as local farmers, agricultural extension officers, and community leaders were conducted to gather qualitative insights on the challenges and opportunities related to small-scale crop production and food safety. Focus group discussions were also organized with community members to explore their perceptions and experiences regarding food safety and the significance of local crop production in meeting their dietary needs. In the quest of providing rich and detailed description of the study, observation was also used in order to provide quality research information.

3.4 Research methods

Research methods are the approaches utilized in conducting research operations. Various methods were utilized to collect data in order to obtain trustworthy and valid information that was necessary and relevant to the study. According to Creswell and Creswell (2018), numerous sources assure the internal validity of the data obtained; hence, in this study, data collection was triangulated utilizing a questionnaire, interviews with important informants, and observations to collect qualitative data. Photography was also employed in this investigation to demonstrate proof.

3.5 Data collection instruments.

The data gathering devices employed in this study included an interview guide, questionnaires,an observation guide, and photographs. These technologies were used to ensure that questions are asked consistently.

3.5.1 Questionnaires

Questionnaires were utilized as a primary research method to gather data. The researcher employed a combination of self-administered researcher-administered questionnaires to collect information from different groups within the community. The researcher distributed a total of 70 questionnaires for this study. Out of these, 50 questionnaires were self-administered, while 20 were researcher-administered.

The self-administered questionnaires were completed by small-scale farmers actively engaged in crop production in ward 9 of Mberengwa rural district. This group was chosen because they are directly involved in crop production activities and have firsthand experience with the obstacles and possibilities related to small-scale farming in the area. Their insights were crucial for understanding the dynamics of crop production as well as how it affects household food security.

The researcher-administered questionnaires were completed by local agricultural extension officers and community leaders who had in-depth knowledge of the agricultural practices and food safety situation in the region. These individuals were chosen according to their qualifications and experience working closely with small-scale farmers in ward 9. Their perspectives provided valuable insights into the broader context of crop production and its implications for household food security.

The participants for both types of questionnaires were chosen through the use of a purposive sampling method. Small-scale farmers were chosen based on their active involvement in crop production activities, while agricultural extension officers and community leaders were selected for their specialized knowledge and experience relevant to the research topic. The surveys sought to gather information on the following topics: small-scale crop production and household food sefety. The data collected included information on the types of crops grown by small-scale farmers which is critical in understanding the existing mixed farming crops in Mberengwa, ward 9. Farming practices and techniques employed by the farmers were considered as these will lead us to comprehend the lead of food insecurity within the study area. The researcher investigated the income levels or socioeconomic status of residents can help identify disparities in access to diverse food sources, affordability of nutritious foods, and reliance on specific types of food items. Educational attainment of individuals in ward 9 was also assessed as it can provide insights into knowledge about nutrition, awareness of sustainable farming practices, capacity for adopting new food sources. Challenges faced in crop production could not be left out as they are crucial in the food security issue. If these challenges go unnoticed, the study will be of less use as the main goal is to prevent food insecurity in rampant. There is difference in the access of resources in every rural set up, mostly depending on the unequal political distribution of land by the fore fathers and this is inherited literally to "infinity", therefore availability of resources like land, seeds, fertilizers, and water were also included. Household food consumption patterns, perceived agricultural production's effects on food security and the suggestions for improving food security through agriculture were also taken note of.

The closed-ended questions provided structured data that could be quantitatively analyzed to identify trends and patterns, while open-ended questions allowed participants to provide detailed insights, opinions, suggestions regarding crop production and food safety issues. Overall, the combination of self-administered and researcher-administered questionnaires enabled the researcher to gather comprehensive data from multiple perspectives within the community, shedding light on the intricate connection between small-scale crop production as well as food security in households in the rural areas.

3.5.2 Interviews

The research methods employed involved key informant interviews rather than open interviews. Key informant interviews were chosen as they are particularly useful when seeking in-depth insights from individuals with specialized knowledge or experience related to the research topic. In this case, the selection of important informants was based on their direct involvement or expertise in small-scale crop production and its impact on household food security in the specified rural area.

3.5.3 Focus group discussions

Focus group discussions (FGDs) were utilized as a research method to gather insights and opinions from participants regarding small-scale crop production and how it affects the food security of households. FGDs are a valuable qualitative research technique that allows for in-depth exploration of attitudes, perceptions, and experiences related to a specific topic. A total of 4 FGDs were conducted to ensure comprehensive coverage of perspectives and experiences related to small-scale crop production as well as food security for households in the rural areas of Mberengwa district ward 9. Conducting multiple FGDs enabled the researcher to capture diverse viewpoints and identify common themes across different groups. The participants in the FGDs were selected based on their involvement in small-scale crop production activities and their relevance to the research topic. In this study, the participants included, small-scale farmers actively engaged in crop production, community leaders or representatives familiar with agricultural practices, local agricultural extension officers with expertise in crop cultivation.

Each FGD consisted of 8-10 participants to ensure a balance between having a variety of perspectives while maintaining a manageable group size for effective facilitation and discussion. A smaller group size allows all participants to actively engage in the conversation, share their insights, respond to questions posed by the facilitator. Additionally, with 8-10 participants, there is enough diversity to capture different viewpoints without overwhelming the discussion. Conducting four FGDs with 8-10 participants per group allowed for a thorough exploration of small-scale agriculture production's contributions to household food security in Mberengwa rural district ward 9, Zimbabwe.

3.5.3.1 Gender issues

Gender issues were carefully considered in the selection of participants for the FGDs due to the potential impact of gender roles and dynamics on small-scale crop production and household food

safety. Efforts were made to ensure gender balance within each FGD by including both male and female participants. This approach was used to capture gender-specific perspectives on agricultural practices, resource availability and decision-making procedures pertaining to crop production. The researcher was sensitive to gender dynamics during the discussions, encouraging equal participation from all participants regardless of gender. By creating an inclusive environment where all voices are heard, the FGDs provided a more holistic understanding of how small-scale crop production impacts both men and women in rural households. By considering gender issues and ensuring diverse representation among participants, the study aimed to capture nuanced insights that reflect the realities faced by farmers, both male and female, in the community.

3.5.4 Observation

Researcher observation had a significant impact in gathering data insights. The use of an observation checklist was instrumental in structuring and organizing the observations conducted during the research process.

3.5.4.1 Observation Checklist Usage

The researcher utilized an observation checklist to systematically record track specific activities related to small-scale agriculture and their impact on household food security. The check-list included items such as types of crops grown, farming practices employed, yields obtained, storage methods, and overall food availability within households.

Through the observation checklist, the researcher noted several facets of Mberengwa district's small-scale crop cultivation in rural areas. This involve monitoring planting techniques, irrigation practices, pest control measures, harvesting methods, post-harvest handling, and distribution channels. Additionally, the researcher observed the diversity of crops grown, the efficient use of land resources and the fusion of conventional farming expertise with contemporary methods.

The observations using the checklist were conducted multiple times over a specified period to capture seasonal variations and changes in agricultural practices. Regular observations provided a comprehensive understanding of how small-scale crop production contributes to household food security throughout different stages of the farming cycle. Observation allowed the researcher to gather firsthand information on small-scale crop production practices and their direct impact on household food safety. By observing actual farming activities and outcomes, the researcher could

validate the information provided by participants through interviews or surveys. Observing on-site provided a contextual understanding of the difficulties rural farmers encounter in relation to food security agricultural sustainability. Through observation, the researcher could generate insights into innovative farming techniques, resource management strategies, potential interventions in order to improve household food security.

Researcher observation using an observation checklist was a fundamental component of studying the contribution from small-scale crop production to household food safety in rural Zimbabwe. It facilitated structured data collection, detailed parameter observations, frequent monitoring, and valuable insights essential for addressing food insecurity issues in agricultural communities.

3.5.5 Camera

Incorporating photographs can provide several critical benefits. Firstly, visual aids like photographs can enhance the clarity understanding of the research methodology employed in the study. They can visually represent key aspects such as data collection techniques, fieldwork settings, sample selection processes. Photographs can also serve as valuable documentation of the research process, adding credibility and transparency to the study. By including images of research activities, equipment used, locations surveyed, readers can gain insights into the rigor authenticity of the research conducted. Photographs have the potential to make the dissertation more engaging and visually appealing to readers. They can break up long textual content, maintain reader interest, provide a glimpse into the practical aspects of conducting fieldwork in rural areas.

3.6 Target population

The key informants targeted for this study included individuals such as local farmers. Small scale farming in ward 9, Mberengwa is practiced by every household, therefore, every household is actively engaged in small-scale crop production within ward 9 of Mberengwa rural district. Agricultural Extension Officers were also included as they are professionals with knowledge about agricultural practices and policies relevant to the study area. Community leaders as they are individuals who hold influential positions within the community have insights into local agricultural activities and food security issues were also chosen as key informants. NGO representatives as they are personnel from non-governmental organizations working on agricultural development or food security programs in the region were also not left out.These key informants were chosen according to their firsthand knowledge and experience regarding small-

scale crop production, agricultural challenges, food security issues, and community dynamics within the specified rural setting. Their perspectives were deemed crucial for gaining a thorough comprehension of the research issue for offering insightful information that could contribute to addressing food insecurity challenges in the area.

3.7 Sampling techniques

The selection process for key informants involved several steps. Researcher identified potential key informants based on their roles, expertise, relevance to the study's objectives. Local authorities, community members, and organizations were consulted to verify the credibility and suitability of potential key informants. Efforts were made to ensure diversity among key informants by including individuals from different stakeholder groups such as farmers, officials, leaders, and practitioners. Key informants were approached respectfully, informed about the study's purpose, asked for their voluntary participation. Assurances of confidentiality were provided to encourage open sharing of information without fear of repercussions.

By selecting a diverse group of key informants with varied perspectives experiences related to small-scale crop production and food security in rural Zimbabwe, the research aimed to gather rich qualitative data that could offer valuable insights into the research topic.

3.8 Data Analysis:

Statistical Package for the Social Sciences (SPSS)

In this study data analysis was done using SPSS 20 whereby bar charts, pie charts tables were used to present data. Outcomes were presented by sex or age groups in some cases it was combined. In order to check for any missing data or errors, data cleaning was done thus, verifying validity and reliability of instruments. Because SPSS provides a wide range of features to support the full analytical process, from data preparation to analysis reporting, the researcher decided to adopt it and mostly it expedites streamlines data analytics (Kuttappa, 2021). By utilizing SPSS for data analysis and ensuring thorough data cleaning processes, this study not only presented findings effectively but also upheld the integrity and credibility of the research instruments, aligning with best practices in quantitative analysis methodologies.

3.9 Data reliability study validity

To further enhance the methodological rigor of the study, it is important to delve into the significance of ensuring reliability and validity in research design and data collection processes. Middleton (2023) explains that principles like validity and dependability are employed to assess the caliber of research indicating how well a method, technique or test measures something bringing out consistency and validity of a measure. In this study a pilot survey was undertaken in order to determine validity of the instruments. This was done to gain familiarity with the environment respondents thus assessing arrangements for fieldwork. This also helped to make estimates of the time it will take to complete questionnaires, response rates as well as necessary alterations to the layout of the questionnaire.

3.10 Ethical considerations

Ethical guidelines were adhered to in order to protect the rights legally, of research participants as well as enhancing research validity. Whilst conducting this research the researcher first asked for permission, obtained informed consent, observed traditional cultures and norms as well as assurance of privacy and confidentiality to the participants. The investigator requested authorization to conduct the research from the District Administrator (DA) and headman. Observation of these ethics also helped to maintain peace as interactions with the participants remained confidential and they were made aware of the study's objectives as well as their right not to continue or answer questions that made them feel uncomfortable.

3.11 Limitations of the study

Some responses from the respondents of the study were biased due to issues of confidentiality. Zimbabwe is in the midst of post elections saga, hence the people were afraid to openly share their views and concerns due to the political atmosphere. Therefore, in order to enhance the study's results, participants received guarantees that whatever information they had was private and confidential. Language was a barrier as most of the people could not understand English, hence in order to deal with this the researcher had to engage assistants who relayed the questions in Shona and Ndebele as there are some parts of ward 9 where they mix Shona and Ndebele, hence their Shona is not fluent they don’t understand it well.

3.12 Chapter summary

In this chapter discussions were conducted on the instruments utilized in the research, the sample strategies employed in the data collection, and the research methodology. The research design

accommodated both quantitative and qualitative methods, though qualitative methods were more dominant. In order to facilitate statistical analysis, quantitative data were coded using Statistical Package for Social Sciences (SPSS). Following that, the data was shown using tables, bar graphs, pie charts.

CHAPTER IV

FINDINGS DISCUSSION

4.1 Introduction

Key discoveries are discussed in this chapter. A combination of both narrative and interpretive techniques was used in data analysis. Some of the sections discussed in this chapter include the livelihood status of farmers, consequences of global warming and challenges faced by smallholder farmers in ward 9, Mberengwa district.

4.2 Demographics of participants

This section examines the respondents' demographics in Ward 9. These attributes include of age, marital status, education level, and gender. The respondents were smallholder farmers from the ward.

4.2.1 Smallholder farmer's gender

This section presents data on the respondents' gender distribution in the research area. Gender is important consideration in small scale farming and household food security, as men and women often have distinct roles responsibilities in agriculture food preparation. Figure 4.1 shows the gender of participants.

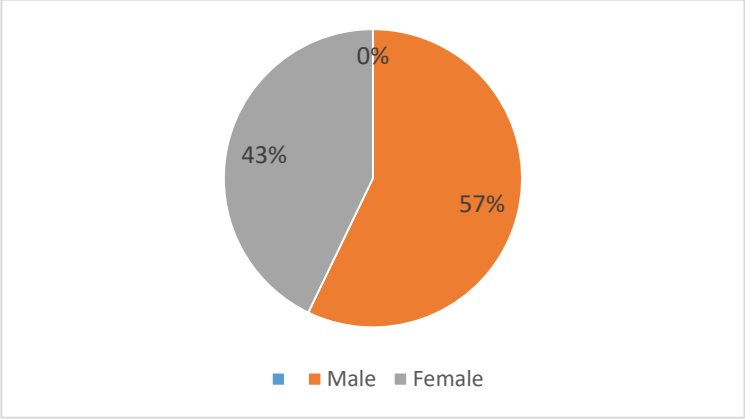


FIGURE 4. 1 GENDER OF RESPONDENTS

Figure 4.1 illustrates that the majority of the respondents were males as they dominated with 57.4% whilst females 42.86%. This is so because men generally have access to agricultural resources than

women according to FAO (2011). This has also been supported by Pritchard et al., (2017) who mention the effect of land ownership as most women have no land but depend on their husbands' land for production. Smallholder farming is labour intensive as there is lack of mechanisation, hence men take up heavy work such as clearing the land and ploughing. Most of the few women interviewed have their husbands working out of Mberengwa and if not that way, gender balance could have been literally a nightmare. In a focus group discussion, a women stood up when the researcher asked if they have any assistance from the state or the non-governmental organisations for easy access of inputs, in frustration, she stated

tinoshisirwa politics kupiwa vana mbeu, dai pasina varume vedu vanosha kunana Harare uko tisina kana fertilizer chaiyo, dai takatofa nenzara nekuti zviviri izvozvo zvaunenge wawana ukadyao nevana munomwa mvura, (government inputs are distributed based on political affiliation, if not for our husbands working outside Mberengwa we could have died of hunger). Most women stood up in support of her point and men agreed with the statement. This therefore shows that men have access to agricultural resources than women hence their sex outnumbered females as everything to do with farming is literally in their favor.

4.2.2 Small holder farmers' age

This section explores the distribution of respondents' ages in the study area (ward 9). It's critical to comprehend the respondents' age distribution in providing context for the study, as it may reveal patterns or correlations that could be related to food security small scale farming.

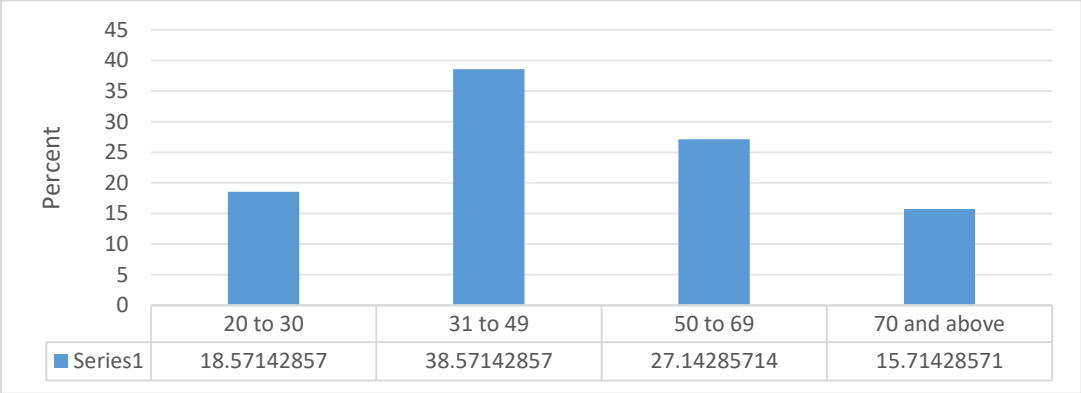


FIGURE 4. 2 AGE OF RESPONDENTS (N=70)

)

Figure 4.2 indicates that the majority of respondents range from 30-69 years as both age groups 31-49 and 50-69 consisted 39% and 27% of the respondents respectively. This suggests that small scale farming in ward 9 Mberengwa rural district is likely to be carried out by adults, with those in their 30s and 40s potentially being the primary drivers of farming activity in the area. The lower proportion of older respondents could indicate that small scale farming may be too physically demanding for older adults, or that they may prefer to allocate their time and resources to other activities. Since small scale farming involves almost everyone in the household, the elderly might have retired from carrying out farming duties and it is now the responsibility of those within the active age according to figure 4.2, the age range is (30-69). These age group of 30 – 49 had the highest number of respondents as in most cases they encompass the economically active people. Whereas, those between 20 and 30 had 18.57%. The elderly that is those of age 70 and above constituted 15.71% of the respondents and they were of great importance to the research as they hold great indigenous knowledge due to many years of experience as they have witnessed a lot. They were consulted in this research in order to access more valuable information in agreement with Tazeze et al. (2012) who made the statement that age-related experience increases strategy. Chanza (2014) echoing the same sentiments stated that, indigenous knowledge is essentially important because it enhances scientific understanding of how to lessen household susceptibility to climatic fluctuations and alter farming methods. The data on respondent ages suggests that small-scale farming in ward 9 of Mberengwa rural district is predominantly carried out by adults, with the majority in their prime working years. This finding provide information about the possible demographic makeup of the region's small-scale farmers, highlighting the potential factors that may influence their ability to contribute to household food security.

4.2.3 Marital status of respondents

This section examines the marital status distribution of respondents in the study area, specifically Ward 9 of Mberengwa rural district. Marital status can impact food security and small-scale farming practices, as it can influence household composition, decision-making, and resource allocation.

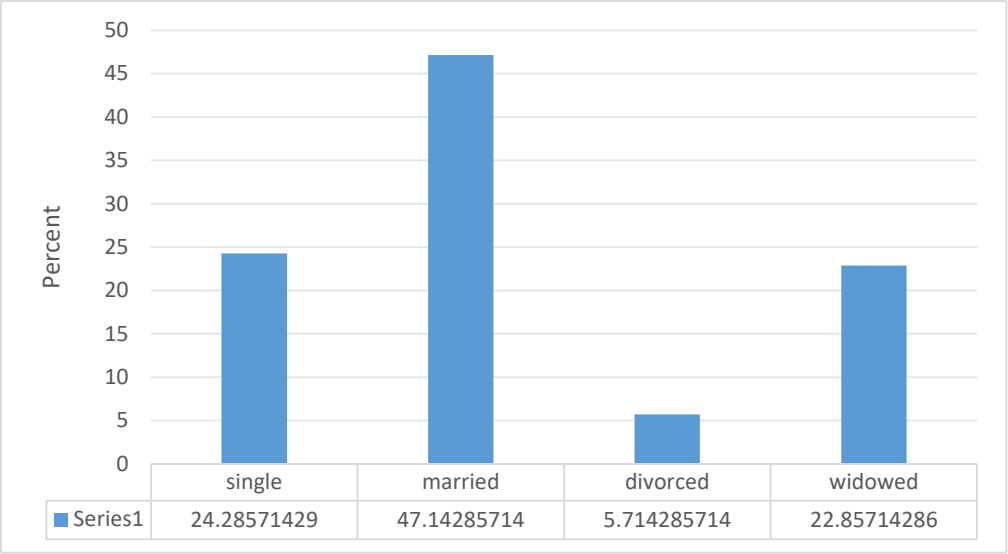


FIGURE4. 3: MARITAL STATUS (N=70)

The study results show that 47.14% were married whilst 22.86% widowed, 5.71% separated 24.29% single as shown in figure 4.3. The data indicates that marriage is the most common marital status among respondents in Ward 9 of Mberengwa rural district, accounting for almost half of all respondents. Admin (2021) believes that a significant portion of smallholder family farms rely solely on a system of family labor. This suggests that married couples may play a vital part in small-scale farming and the area's household food security. The relatively high proportion of widowed respondents is also noteworthy, as this could indicate the prevalence of single-headed households, which may face unique challenges in terms of labor, knowledge,as well as resource accessibility. The low proportion of divorced respondents may reflect traditional views on marriage and family in the area.The data on marital status suggests that small-scale farming in Ward 9 of Mberengwa rural district is influenced by the family structures and dynamics of respondents. The prevalence of married couples and widowed respondents indicates potential differences in farming practices and household food security, highlighting the importance of considering these factors in developing interventions policies

4.2.4 Level of education of respondents

This section looks at the respondents' educational background in Ward 9 of Mberengwa rural district. Education is an important determinant of livelihood strategies and decision-making ability in small-scale farming households.

Figure 4.4 shows how respondents' educational levels were distributed in Ward 9 of Mberengwa rural district.

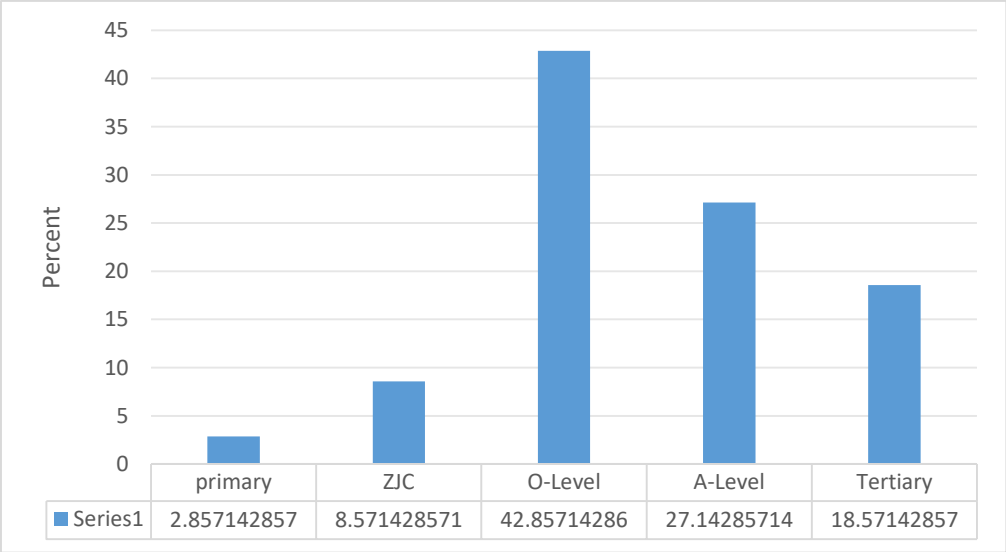


FIGURE 4. 4 : LEVEL OF EDUCATION OF RESPONDENTS (N=70)

The data suggests that most respondents (42.86%) have completed their O-level education, which is the secondary education equivalent in Zimbabwe. A smaller proportion (27.14%) have completed their A-level education, while 18.57% have attained tertiary education. A small proportion (2.86%) have completed only primary education, 8.57% have completed their Junior Certificate (ZJC). This distribution of educational levels highlights varying levels of knowledge and skills among respondents, which may influence their engagement in agriculture and livelihood strategies. The data on respondents' educational levels reveals a range of educational backgrounds in Ward 9 of Mberengwa rural district. Providing training extension services that cater to different educational levels could potentially increase the uptake of better farming techniques and technologies,as well as improve household food security and livelihoods. However, strategies should also consider alternative methods of disseminating information, such as demonstration plots or farmer-to-farmer learning, for those with lower levels of formal education.

4.3 Food sources in Mberengwa

This section focus on understanding households' access to different food sources. This was done to have insights on their level of food security, dietary diversity and overall nutritional status.

This information can inform interventions aimed at enhancing food security and addressing nutritional deficiencies.

4.3.1 Crops cultivated by respondents

This section investigates the diversity of crops cultivated by respondents in their small-scale farming activities in Ward 9 of Mberengwa rural district. Crop diversity can be crucial to ensuring food security because it provides a wider range of nutrients, can mitigate risks from climate variability, and can increase market opportunities. Participants were asked how many types of crops do you cultivate on your farm. Figure 4.5 illustrates the diversity of crops cultivated by respondents in Ward 9 of Mberengwa rural district.

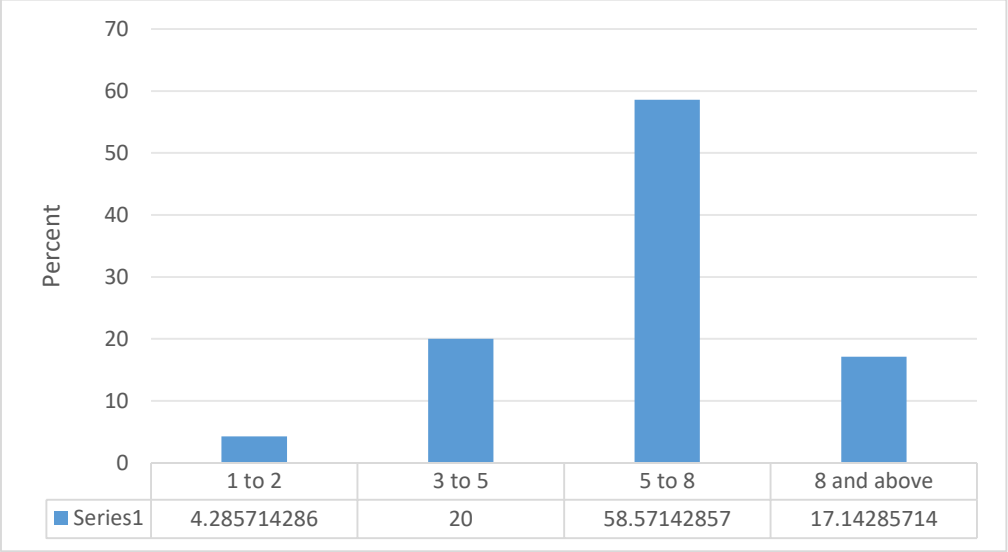


FIGURE 4.5: DIFFERENT TYPES OF CROPS CULTIVATED BY FARMERS IN WARD 9 (N=70)

According to the data, the majority (58.57%) of respondents reported cultivating 5 to 8 types of crops, suggesting a relatively high level of crop diversity. However, 17.14% of respondents reported cultivating more than 8 types of crops, which could reflect a strategy for maximizing food security livelihoods. The following photographs show different types of crops that are grown by a single small scale farmer in Rengwe, ward 9.

Image 4.1 shows beans grown by a farmer in Rengwe, a place in ward 9.

Image 4.1 beans grown by a small holder farmer.

Image 4.2 shows barley grown by a smallholder farmer in Rengwe, ward 9

Image 4.2 Barley grown by a small holder farmer.

Image 4.3 shows maize plants that were harvested by a farmer in ward 9, Mberengwa.

Image 4.3 Maize plants harvested by a small scale farmer in Rengwe, ward 9

Hauggaard-Nielsen et al (2001) further emphasize that intercropping systems can enhance resource utilization by exploiting complementarity between different plant species. On the other hand, 20% of respondents reported cultivating 3 to 5 types of crops, a small minority (4.29%) reported cultivating only 1 to 2 types of crops, suggesting lower levels of crop diversity and potentially greater vulnerability to climatic market shocks. The data on crop diversity reveals varying levels of adoption among respondents in Ward 9 of Mberengwa rural district. Promoting crop diversification could potentially enhance food security and resilience, particularly for those households with low levels of crop diversity. However, supporting farmers to manage multiple crops effectively, especially in light of the fluctuation of the climate, labor constraints, and market uncertainties, may require additional training technical support.

4.3.2 Household members involved in small scale farming

To assess the household food needs in Mberengwa, the quantity of household members involved in small-scale crop production in Ward 9 of Mberengwa rural district was examined. Understanding the level of household engagement in crop production is important for assessing the role of small-scale farming in household food security. Participants were asked how many household members are involved in small scale farming.

Figure 4.6 displays the distribution of household members participating in small-scale crop production in Ward 9 of Mberengwa rural district.

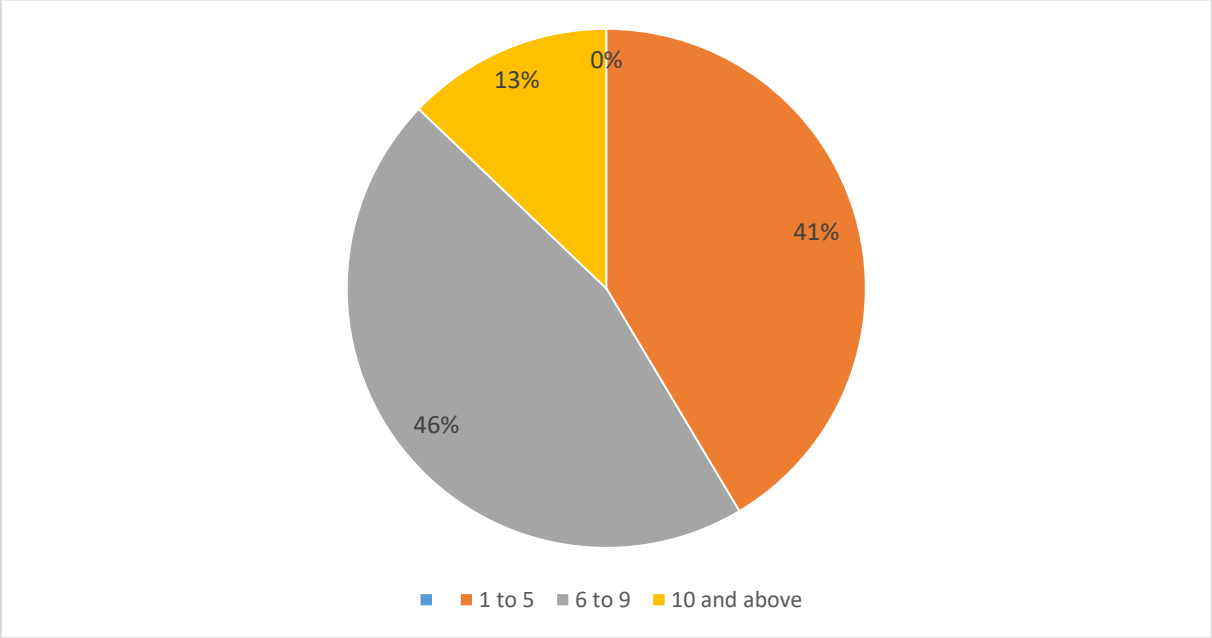


FIGURE 4.6: HOUSEHOLD MEMBERS IN SMALL SCALE CROP PRODUCTION IN WARD 9 (N=70)

The data shows that a significant proportion of households (41.43%) reported 1 to 5 members engaged in small-scale crop production, while 45.71% reported 6 to 9 members involved. Interestingly, a smaller proportion (12.86%) reported 10 or more members involved in small-scale crop production, suggesting a higher level of labor availability in some households. One of the key respondents said,

Household members provide labor for several agricultural tasks, including crop planting, weeding, harvesting, and processing. Their physical work is vital for the daily management of the farm.

The data highlights the importance of household-level factors, such as labor availability and crop production skills, in determining the extent of small-scale farming and its contribution to household food safety.

The data on household members involved in small-scale crop production reveals a wide range of engagement levels in Ward 9 of Mberengwa rural district. Households with higher levels of labor availability and participation in crop production are more likely to benefit from small-scale farming in terms of livelihoods and food security. Interventions that encourage the growth of farming skills and the mobilization of labor for crop production could be beneficial in increasing the contribution of local households' access to food through small-scale farming.

4.4 Household food needs

Assessing food needs provides a comprehensive understanding of the current food situation, identifies potential gaps in food security, offers insights into how small-scale crop production can be optimized to improve food security for households in the area under study.

4.4.1 Food shortage experience

Investigations for the frequency of food shortages experienced by respondents in Ward 9 of Mberengwa rural district were taken. Understanding the prevalence of food shortages is critical in determining how severe food insecurity is, and the potential need for interventions to address it. To understand the food needs of households in Mberengwa, ward 9, respondents were asked, “how often do you experience food shortages in your household?”

Figure 4.7 displays the frequency of food shortages reported by respondents in Ward 9 of Mberengwa rural district.

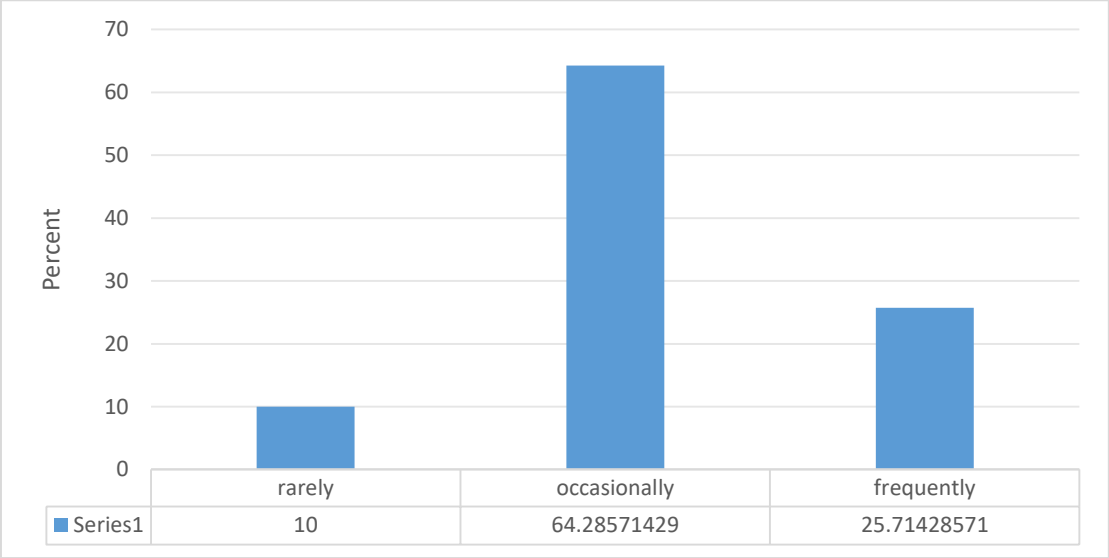


FIGURE 4.7: HOW FARMERS IN WARD 9 EXPERIENCE FOOD SHORTAGES (N=70)

According to the data collected from the respondents regarding the frequency of experiencing food shortages in their households, 64% reported experiencing food shortages occasionally, 10% said they rarely experience food shortages, 26% mentioned facing food shortages frequently. This data provides valuable insights into the food security situation in Mberengwa rural district, specifically in ward 9. Chazovachii (2012) emphasizes the importance of understanding the underlying causes of food shortages in rural communities to develop effective strategies for addressing food insecurity. The data collected aligns with Chazovachii's perspective, highlighting that a significant portion of households in ward 9 are facing food shortages at varying frequencies.

The majority of respondents (64%) reported experiencing food shortages occasionally. This suggests that while food shortages are not a constant issue for these households, they still face challenges in accessing an adequate and reliable food supply. One of the key respondents gave his own perspective according to what the farmers experience

I suggest exploring alternative solutions such as community gardens, food assistance programs, or agricultural diversification. To address the issue might be of great effectiveness. He added *that*

the government has to emphasize the importance of further research and collaboration with local communities to develop sustainable strategies for improving food security.

Understanding the factors contributing to these occasional shortages is crucial for developing targeted interventions. A notable portion of respondents (26%) mentioned facing food shortages frequently. This indicates a more severe level of food insecurity in these households, with potential implications for nutrition and overall well-being. Exploring the reasons behind these frequent shortages is essential for implementing sustainable solutions. A smaller percentage of respondents (10%) reported rarely experiencing food shortages. While this group represents a minority, studying the factors that contribute to their relative food security can provide insights into successful practices or resources that could be scaled up to support other households facing more frequent shortages.

4.4.2 How do households sell their surplus

The marketing channels used by households in Ward 9 of Mberengwa rural district to market their surplus crop produce were also examined. Understanding these channels can provide significant understandings of the flow of food income in the area. Respondents were asked "How do households in Ward 9 market their surplus crop produce?"

Figure 4.8 depicts respondents' reported marketing channels for surplus crop produce in Ward 9 of Mberengwa rural district.

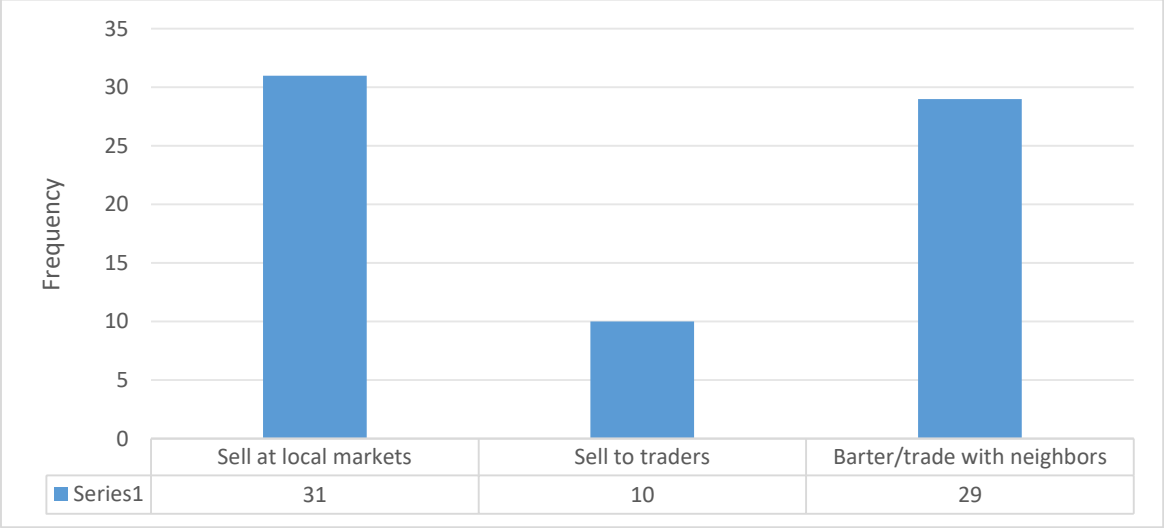


FIGURE 4.8: HOW HOUSEHOLDS IN WARD 9 MARKET THEIR SURPLUS CROP PRODUCE (N=70)

The data shows that households in Ward 9 of Mberengwa rural district primarily use three main channels to market their surplus crop produce: selling at local markets (44.3%), selling to traders (14.3%), and engaging in barter trade with neighbors (41.4%). The predominance of barter trade suggests a high level of informal trade and exchange in the area, which may provide important avenues for meeting household food needs and generating income. This is also a proof of poor infrastructure in ward 9 and also a support to the sentiments of the key informants who said

farmers are not selling their hard worked products because of limitations in transforming the goods, roads are a death trap to almost all loaded trucks and its better to lose a small portion of money rather than life, so we exchange goods to goods life goes.

Reardon et al (2014) also states that limited access to markets due to poor infrastructure or lack of information can restrict farmers' ability to market their produce at fair prices, affecting their income levels and overall food safety status. Selling at local markets to traders appears to be less common, potentially indicating limited access to markets or the absence of formal market infrastructure. For farmers in places like Rengwe, Vutika,Vutsanana, the distance to major market places like Mberengwa town and Mataga growth point is unimaginable, worse with roads in very poor conditions, the distance becomes a major barrier.

The data on the marketing channels used by households in Ward 9 of Mberengwa rural district highlights the importance of informal trade exchange in the local economy. Farmers who benefit from fair market prices are the ones in places like Mawani, and Gudojena which are near Mberengwa town and those in Rengwe near Sihande river which is adjacent to Mataga growth point. Assisting in the growth of regional marketplaces, improving access to market infrastructure, and promoting formal trade channels could potentially enhance household incomes and food security. However, it is important to consider the potential impacts of formalization on existing informal networks to support the development of inclusive, efficient, and equitable market systems.

4.5 Current status of small scale crop production in ward 9, Mberengwa

This section assess the present condition of small-scale crop production provided thorough comprehension of the existing agricultural practices, obstacles as well as chances within the specific context. This assessment allows for informed decision-making, targeted interventions, policy recommendations with the goal of improving food security, sustainable agricultural practices, and overall well-being within the community. Evaluating the current status of small-scale crop production, makes the researcher identify areas for improvement, innovation, support to empower local farmers help ensure sustained food security and economic development.

4.5.1 Land cultivated for crop production

This section explores the size of land cultivated for crop production by respondents in Ward 9 of Mberengwa rural district. Understanding the land area under cultivation is important in order to evaluate food security, as it can affect the amount of food produced and the agricultural practices adopted by small-scale farmers. Participants were asked, "How many acres of land do you cultivate for crop production in Ward 9, Mberengwa rural". Figure 4.9 provides information on the area of land used for crop cultivation in Ward 9 of Mberengwa rural district.

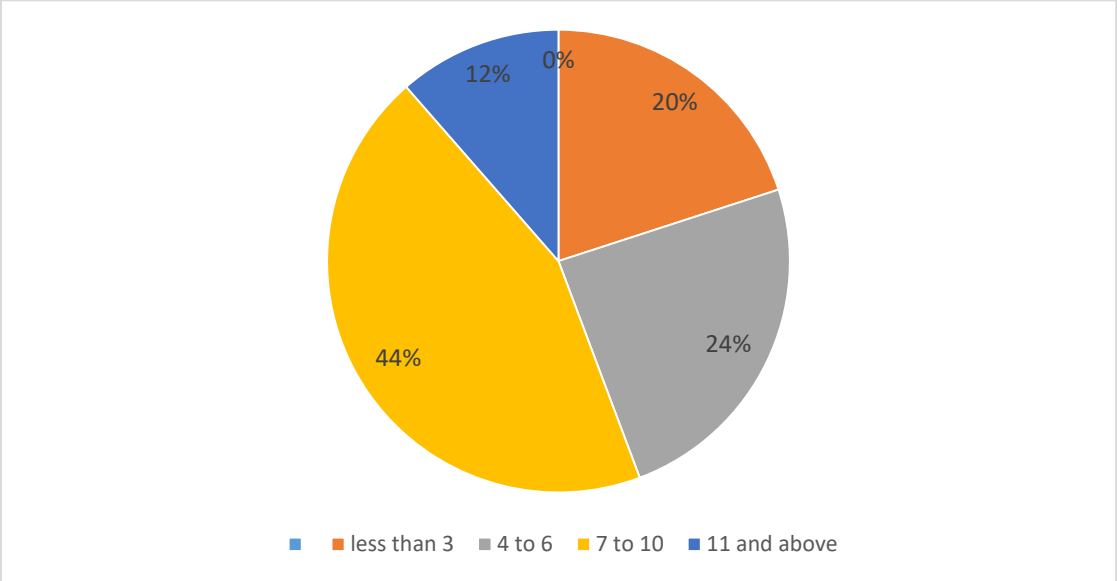


FIGURE4. 9: ACRES OF LAND CULTIVATED BY SMALL-SCALE FARMERS IN WARD 9 (N=70)

The data suggests that the majority of respondents (44%) cultivate 7 to 10 acres of land for crop production, followed by 24% who cultivate 4 to 6 acres. This indicates that most respondents in

Ward 9 of Mberengwa rural district are engaged in small-scale farming on relatively small plots of land. Devereux (2009) states that resource scarcity can lead to vulnerability to food insecurity, especially in rural settings where households rely heavily on agricultural activities for their livelihoods. However, 12% of respondents reported cultivating more than 11 acres of land, suggesting some variability in the size of land holdings in the area.

The data on land size cultivated for crop production highlights the predominance of small-scale farming in Ward 9 of Mberengwa rural district, which is typical of many rural areas in Zimbabwe. The limited land size may affect the capacity of modest farmers to generate sufficient food for household usage sale, and may require interventions to support more productive farming practices.

4.5.2 Changes in weather patterns

Respondents' perceptions of the result of changing weather patterns on crop production in Ward 9 of Mberengwa rural district were also considered. Weather patterns can significantly influence agricultural productivity, particularly in a semi-arid region like Mberengwa. The participants were asked, “have you noticed changes in weather patterns affecting your crop production?” Figure 4.10 displays respondents' perceptions of the effect of shifting weather trends on the yield of their crops in Ward 9 of Mberengwa rural district.

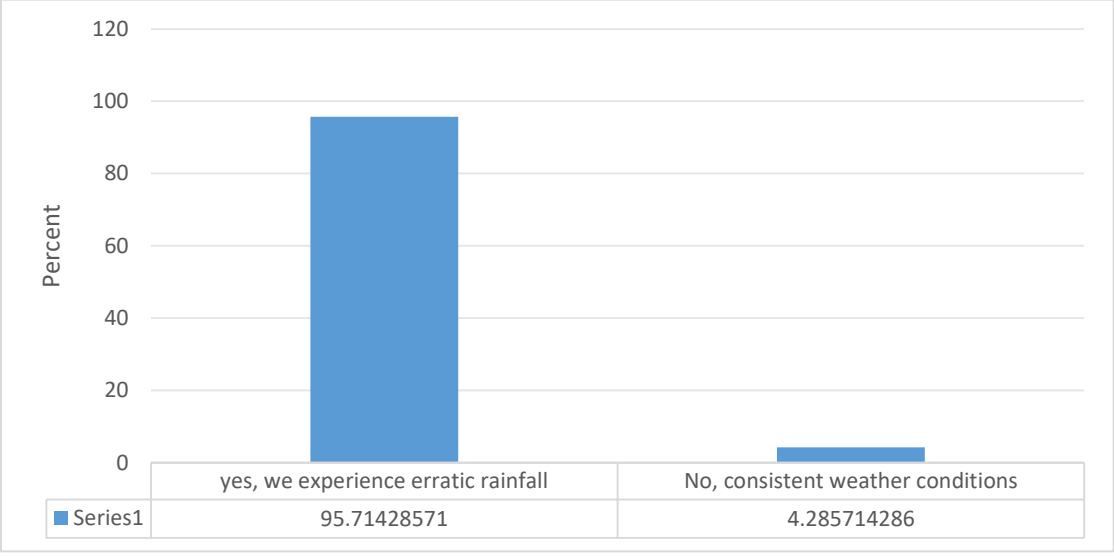


FIGURE4.*1*0: WEATHER PATTERNS AFFECTING CROP PRODUCTION IN WARD 9 (N=70)

The data shows that an overwhelming majority (96%) of respondents perceived changes in weather patterns as affecting their crop production. This elevated consciousness of climate variability and its impacts highlights the vulnerability of the local small-scale growers to the consequences of the changing climate.As stated by IPCC (2014), climate change poses an additional threat to agricultural productivity in Africa, with changing rainfall patterns increased temperatures affecting crop yields .The 4% who reported no perceived changes in weather patterns could be due to localized conditions or differences in farming practices, or may reflect a lack of awareness of climate variability.

The data on perceptions of changing weather patterns underscores the high sensitivity of small-scale farming to climate variability in Ward 9 of Mberengwa rural district. Creating agricultural methods that are climate resilient, including crop diversity, drought-tolerant crops, or water harvesting, could help farmers in the area to mitigate the detrimental consequences of shifting weather patterns on their food security and crop yield.

4.5.3 Nutritional needs

Investigations to respondents' perceptions of their household's food sufficiency in Ward 9 of Mberengwa rural district were undertaken. Nutritional needs are a crucial indicator of food security, as even households that produce sufficient food may not have access to a balanced diet that meets their nutritional requirements. Participants were asked, “Have you noticed changes in weather patterns affecting your crop production?” Figure 4.11 presents respondents' perceptions of their household's food sufficiency in Ward 9 of Mberengwa rural district.

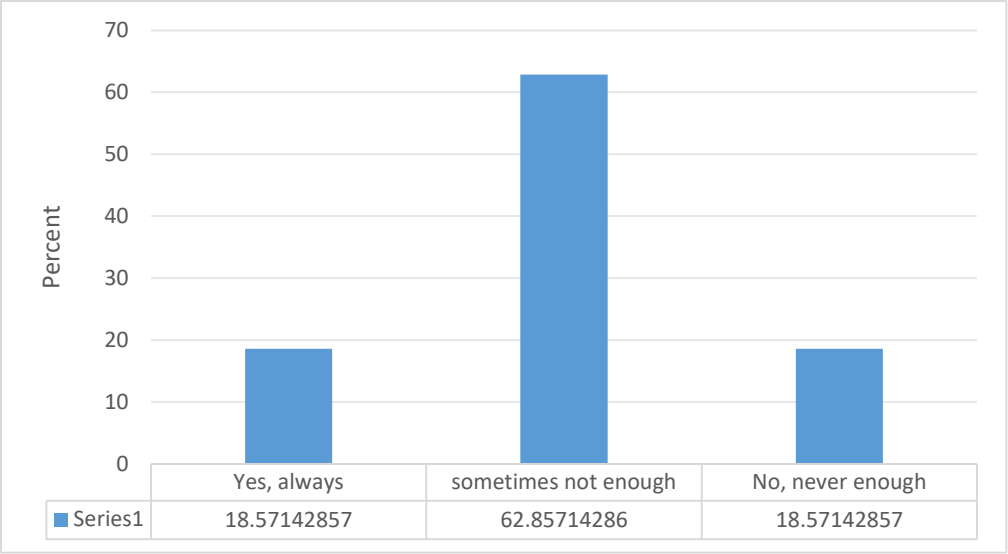


FIGURE 4.*11*: NUTRITIONAL NEEDS OF FAMILY MEMBERS IN WARD 9 (N=70)

The data indicates that only 18.57% of respondents felt that their households always had enough food to meet their nutritional needs. Small-scale farming supports local economies by providing nutritious foods preserving cultural traditions (Rosset and Martinez-Torres, 2012). A significant proportion (62.86%) reported that their households sometimes did not have enough food. Furthermore, 18.57% of respondents reported that their households never had enough food, suggesting severe food insecurity. Informative respondent X said"our households face chronic food shortages, indicating a high level of food insecurity within our community".This may be because of things like inadequate crop production, high food prices, or a lack of off-farm income sources.

The data on household food sufficiency highlights the significant challenge of food insecurity in Ward 9 of Mberengwa rural district, with many households struggling to meet their nutritional needs. Interventions that target both production and consumption aspects of food safety, such as improving crop yields, diversifying income sources, or increasing access to affordable nutritious food, could be beneficial in addressing this problem.

4.5.4 Percentage of household total food consumption

An examination to the involvement of small-scale crop production to households' food consumption in Ward 9 of Mberengwa rural district was taken to understand the current status off small scale crop production in Mberengwa, ward 9. Understanding the contribution of small-scale

farming to food security can inform strategies to lessen susceptibility to food poverty to improve food security in households. Respondents were asked, "What percentage of the household's total food consumption is sourced from small-scale crop production in Ward 9?". Figure 4.12 illustrates the percentage of food consumption sourced from small-scale crop production in Ward 9 of Mberengwa rural district.

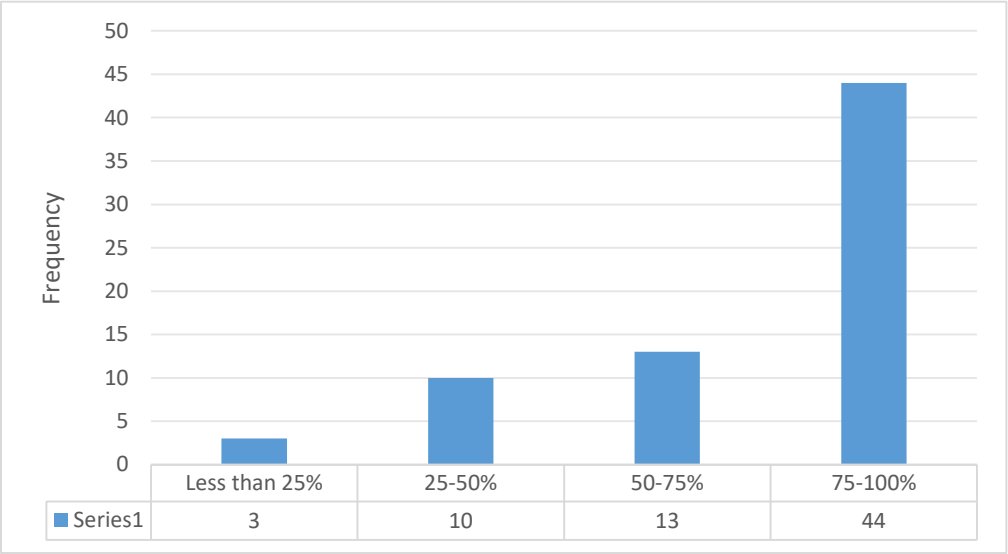


FIGURE 4.*12*: PERCENTAGE OF HOUSEHOLD TOTAL FOOD CONSUMPTION (N=70)

The data suggests that small-scale crop production makes a significant contribution to households' food consumption in Ward 9 of Mberengwa rural district, with more than 75% of food consumption sourced from small-scale farming activities in 62.9% of households. A smaller proportion of households (14.3%) reported that 25-50% of their food consumption comes from small-scale crop production, while a small minority (4.3%) reported less than 25% of their food consumption sourced from small-scale farming activities.

The data on the contribution of small-scale crop production to household food consumption highlights the importance of this sector for food security in Ward 9 of Mberengwa rural district. Supporting small-scale farming through improved agricultural practices, access to inputs, markets could potentially enhance food security and livelihoods in the area. However, strategies should consider the potential trade-offs between small-scale farming and livelihood diversification, as well as the role of other sectors, such as livestock or wage labor, in supporting household food security.

4.5.5 Contribution of income generated

An exploration of the role of income generated from small-scale crop production in contributing to household food safety in Ward 9 of Mberengwa rural district was done. Understanding the relationship between income food safety is critical for developing interventions that enhance both. Respondents were asked, “How does the income generated from small-scale crop production contribute to household food security in Ward 9?” Figure 4.13 shows respondents' perceptions of the role of income generated from small-scale crop production in contribution to household food safety in Ward 9 of Mberengwa rural district.

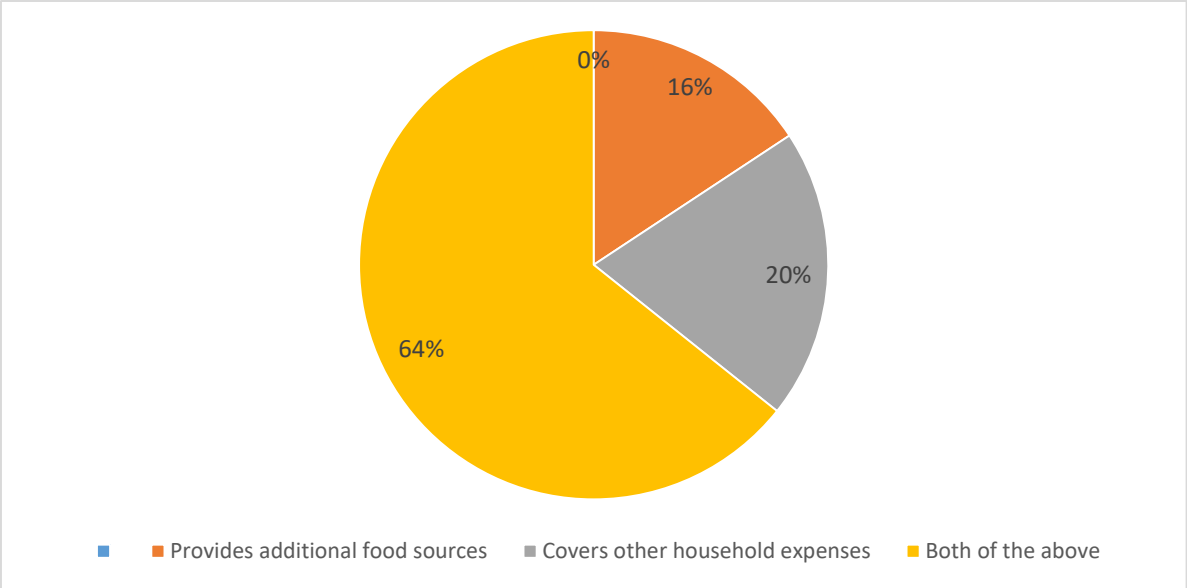


FIGURE 4.*13*: CONTRIBUTION OF INCOME GENERATED FROM SMALL SCALE CROP PRODUCTION (N=70)

The data indicates that a significant proportion of respondents (64.3%) perceive that income generated from small-scale crop production contributes both as a source of additional food covers household expenses, highlighting the dual role of small-scale agriculture to guarantee household food safety. Giller et al. (2006) stress the socioeconomic impacts of inter-cropping on smallholder farmers, including its contribution to income generation and resilience to climate variability. A smaller proportion of respondents (15.7%) identified the contribution of income solely as a source of additional food, while a smaller group (20%) identified its role in covering all household expenses. This suggests that interventions that support small-scale agriculture can potentially enhance both income generation and food safety in the area.

The data on the role of income generated from small-scale crop production in contributing to household food security in Ward 9 of Mberengwa rural district reveals the crucial importance of small-scale agriculture for both food production and income generation. Supporting small-scale agriculture can potentially enhance household food security and livelihoods while also addressing the interrelated challenges of food insecurity poverty in the area.

4.5.6 Income generation

Respondents' engagement in crop sales as a form of income generation in Ward 9 of Mberengwa rural district was examined. Selling crops for income can provide an important source of livelihood and can contribute to household food security, particularly when combined with consumption of the crop. Participants were asked, “do you sell any portion of your crop harvest for income generation?” Figure 4.14 illustrates respondents' engagement in crop sales for income generation in Ward 9 of Mberengwa rural district.

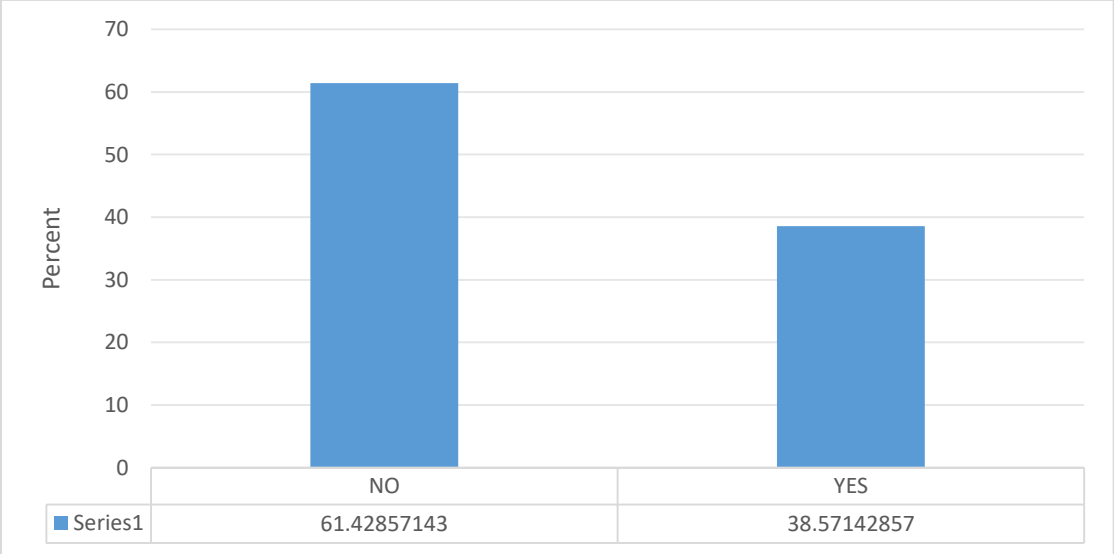


FIGURE 4.*14*: FARMERS WHO SELL SOME OF THEIR CROP HARVEST IN WARD 9 (N=70)

According to the data, the majority (61.43%) of respondents reported not selling any portion of their crop harvest for income generation, while 38.57% reported doing so. This indicates that many households rely solely on crop production for household consumption and do not engage in income-generating activities from their crops. Kabunga (2017) in his research on agricultural practices in rural communities, highlights the significance of households relying solely on crop

production for household consumption. He delves into the implications of this reliance, emphasizing that many households do not engage in income-generating activities from their crops. This sheds light on the challenges faced by such households the potential impact on their economic well-being. The 38.57% who reported selling crops for income generation could be benefiting from additional income sources, which may be used to purchase other food items or improve their living standards.

The data on crop sales for income generation highlights the limited engagement of households in income-generating activities from their crops in Ward 9 of Mberengwa rural district. Encouraging crop sales for income generation could potentially increase household income diversify livelihoods, thereby improving food security and resilience to shocks. However, it is important to consider the potential trade-offs, such as reduced availability of food for household consumption, when promoting crop sales for income generation.

4.5.7 Modern farming training access

Respondents' access to modern farming training in Ward 9 of Mberengwa rural district was also examined. Access to training can be an important factor in improving agricultural practices, food security, and livelihoods, particularly for small-scale farmers who may face resource constraints limited access to knowledge. Respondents were asked, “Have you received any training on modern farming techniques in the past year?” Figure 4.15 shows the responses to the question about access to modern farming training in the past year.

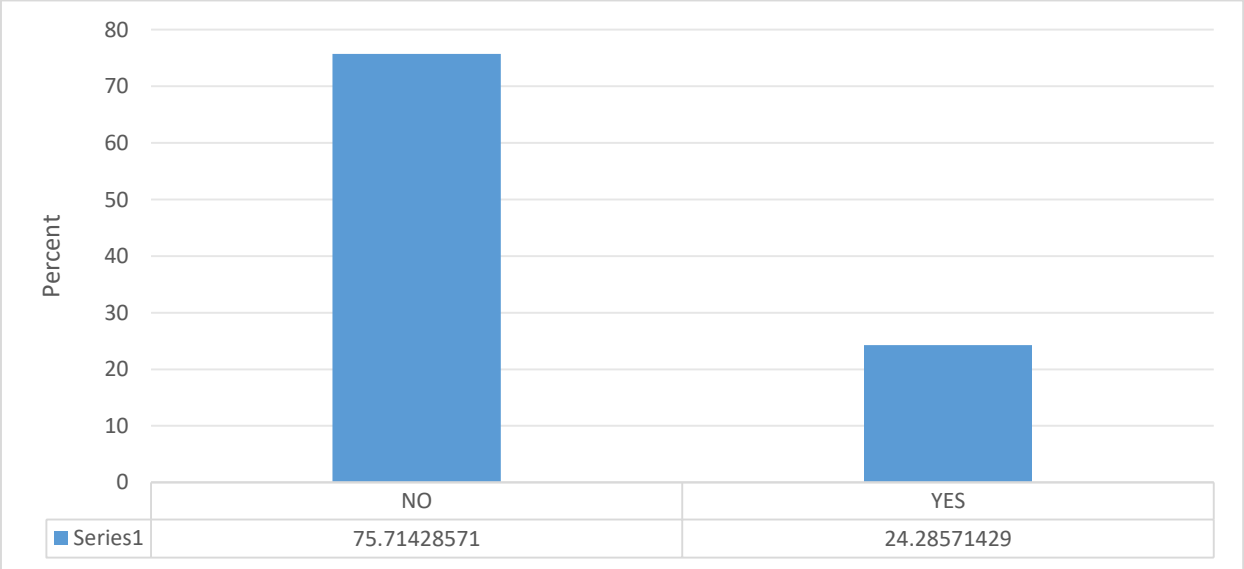


FIGURE 4.15: FARMERS WHO RECEIVED TRAINING IN MODERN FARMING TECHNIQUES IN THE PAST YEAR (N=70)

The data indicates that 76% of respondents reported not receiving any training, while 24% reported having received training. It also suggests that a majority of respondents in Ward 9 of Mberengwa rural district do not have access to modern farming training, which could limit their ability to adopt new technologies, increase yields, and improve food security. Chikazunga et al. (2020) emphasized the role of extension services in providing technical assistance to smallholder farmers on sustainable agricultural practices. The 24% of respondents who reported receiving training may have an advantage in terms of knowledge and skills, which could influence their farming practices and outcomes.The data on access to modern farming training highlights a potential gap in agriculture.

4.5.8 Satisfaction with the current yield

Respondents' satisfaction with the yield from their small-scale crop production activities in Ward 9 of Mberengwa rural district were assessed to understand the current status of food security in ward 9. Understanding the level of satisfaction with yields can provide insight into the adequacy of current agricultural practices the potential for improvement. Participants were asked, ”Are you satisfied with the current yield from your crop production activities?” Figure 4.16 presents respondents' satisfaction with their crop production yields in Ward 9 of Mberengwa rural district.

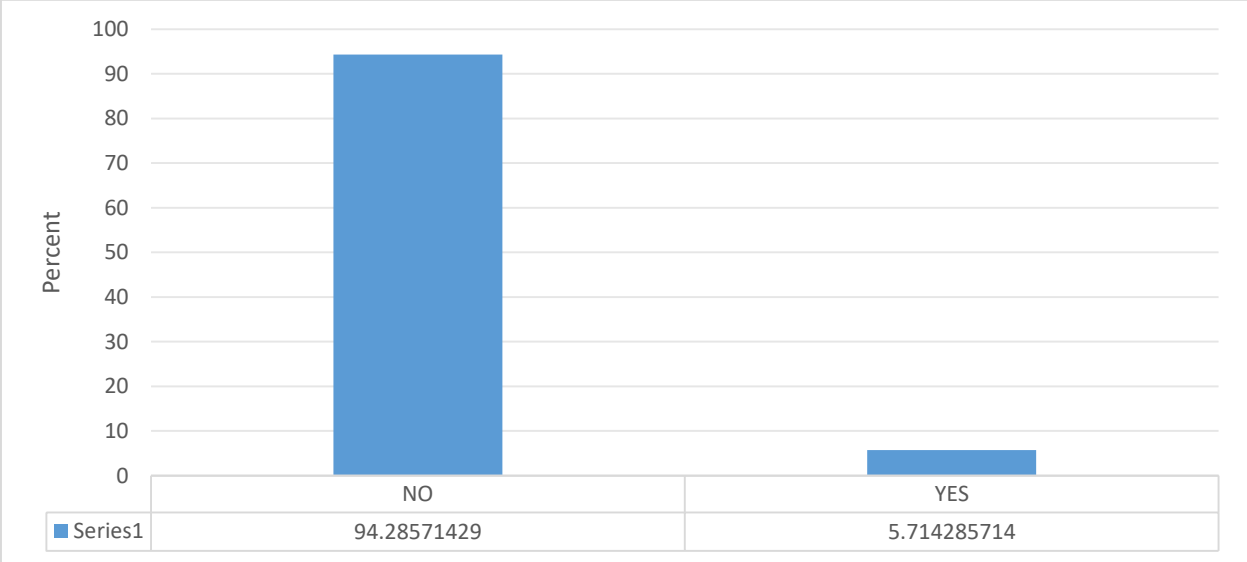


FIGURE 16:FARMERS SATISFIED WITH THE CURRENT YIELDS FROM THEIR CROP PRODUCTION ACTIVITIES (N=70)

The data indicates that the vast majority (94.29%) of respondents reported being dissatisfied with the yield from their small-scale crop production activities, while only a small proportion (5.71%) reported being satisfied. This suggests a widespread perception of inadequate crop production among respondents, which may reflect challenges such as low soil fertility, inadequate water, or pests diseases caused by the climate change effect. According to Chikodzi and Shizha (2019) ,in Southern Africa, including Zimbabwe, climate change has resulted in decreased rainfall, increased temperatures, and increased frequency and intensity of extreme weather events such as droughts floods . These changes have negatively affected small-scale crop production in the region (Chikodzi and Shizha, 2019). The low satisfaction levels highlight the need for interventions to improve crop yields, which could have a significant impact on household food security livelihoods.

The data on satisfaction with crop production yields emphasizes the need for interventions to improve agricultural productivity in Ward 9 of Mberengwa rural district. Supporting the adoption of improved farming practices, technologies, and inputs could potentially increase crop yields, improve food security, and enhance livelihoods in the area. However, it is important to consider the barriers that respondents may face in adopting these interventions, such as cost, availability, or lack of knowledge, to design interventions that address these barriers.

4.5.9 Modern farming techniques

To understand the current food status in Mberengwa, respondents' adoption of modern farming techniques in Ward 9 of Mberengwa rural district was examined. Modern farming techniques, such as irrigation, improved seed varieties, fertilizer use, can improve agricultural productivity and food security. Participants were asked, “do you use any modern farming techniques in your crop production activities?” Figure 4.17 illustrates the respondents' reported adoption of modern farming techniques in crop production in Ward 9 of Mberengwa rural district.

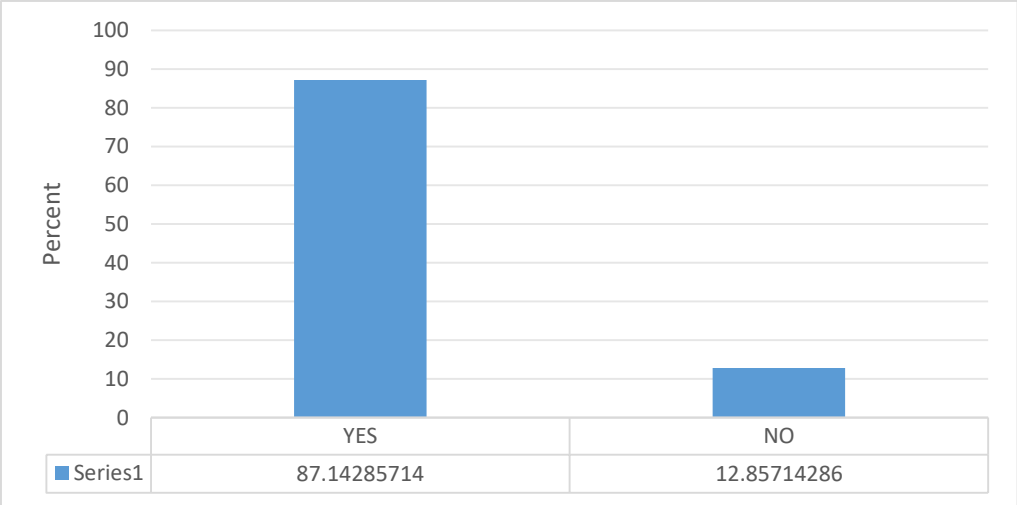


FIGURE 4.17: FARMERS WHO USE MODERN FARMING TECHNIQUES IN THEIR CROP PRODUCTION (N=70)

The data shows that the vast majority (87%) of respondents reported adopting modern farming techniques in their crop production activities. This high level of adoption is a positive indicator of the potential for agricultural development in the area suggests that small-scale farmers may be open to new agricultural innovations. Muzerengi and Mapuranga (2017) argue that the rapid pace of technological advancement and commercialization of agriculture has marginalized traditional practices, leading to a decline in their adoption among smallholder farmers. The 13% who did not report adopting modern farming techniques may be facing barriers, such as cost or knowledge constraints, which could hinder their agricultural productivity and food security. Maxwell et al (2019) argues that inadequate access to essential resources such as fertilizers, irrigation systems, and modern farming technologies can limit crop yields and jeopardize food availability within households.The data on modern farming techniques adoption reveals a high level of willingness among small-scale farmers in Ward 9 of Mberengwa rural district to incorporate these techniques into their agricultural practices. However, the need to address potential barriers for those not adopting modern farming techniques remains critical to improving agricultural productivity and food security in the area.

4.5.10 Availability of water sources impact on crop production

The role of water availability in crop production food security in Ward 9 of Mberengwa rural district was also explored. Access to reliable water sources is critical for agricultural production,

particularly in semi-arid arid areas. Respondents were asked, “how does the availability of water sources impact crop production and food security in Ward 9?” Figure 4.18 presents respondents' perceptions of the impact of water availability on crop production food security in Ward 9 of Mberengwa rural district.

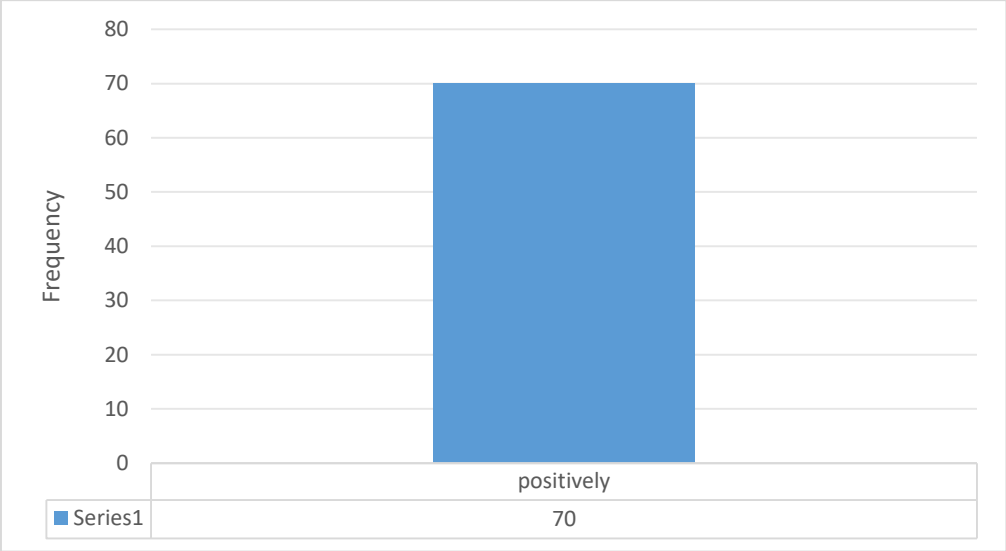


FIGURE 4.18: IMPACT OF WATER SOURCES AVAILABILITY (N=70)

The data shows that 100% of respondents perceived that the availability of water sources positively impacts crop production and food security in Ward 9 of Mberengwa rural district. This underscores the critical importance of water for agricultural production and food security, particularly in an area that is potentially vulnerable to water stress due to semi-arid or arid conditions. The high level of agreement among respondents suggests that supporting the development of water sources, such as irrigation or rainwater harvesting, could potentially enhance food security and agricultural productivity.

The data on the impact of water availability on crop production and food security highlights the potential for enhancing food security and agricultural productivity through interventions that support water access management in Ward 9 of Mberengwa rural district. Supporting the development of water sources, improving water use efficiency, promoting water management strategies could potentially enhance food security and resilience to climate change. However, it is important to consider the potential trade-offs between agricultural water use other water demands,

such as domestic or industrial use, to support equitable allocation of water resources across sectors.

4.5.11 Main challenges faced in ensuring food security

The main challenges faced by households in Ward 9 of Mberengwa rural district in ensuring food security through small-scale crop production were examined in order to understand the current situation. Identifying these challenges is crucial for developing effective interventions to enhance food security livelihoods in the area. Participants were asked, "What are the main challenges faced by households in Ward 9 in ensuring food security through small-scale crop production?" Figure 4.19 illustrates the main challenges faced by households in Ward 9 of Mberengwa rural district in ensuring food security through small-scale crop production.

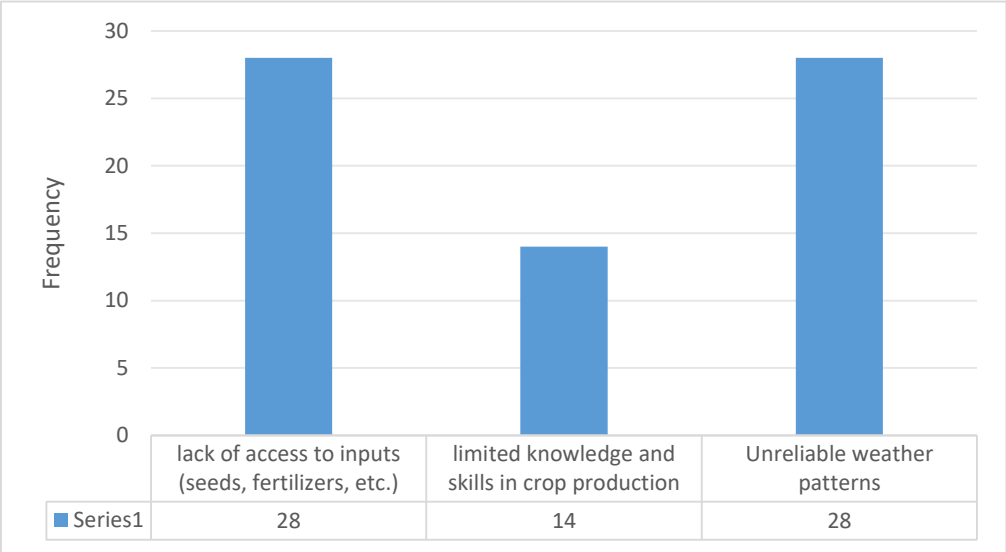


FIGURE 4.19: MAIN CHALLENGES FACED IN ENSURING FOOD SECURITY (N=70)

The data shows that a significant proportion of respondents (40%) identified lack of access to inputs, such as seeds, fertilizers, or tools, as the main challenge in ensuring food security through small-scale crop production. One of the key informants said,"We don't have fertilisers and seeds, we don't know whether we will receive enough rain or not, everything is based on positive assumptions." This suggests that improving access to inputs could potentially enhance agricultural productivity and food security. Another large group of respondents (40%) identified unreliable weather patterns, such as drought or floods, as the main challenge, highlighting the vulnerability of small-scale agriculture to climatic variability.

The data on the main challenges faced by households in Ward 9 of Mberengwa rural district in ensuring food security through small-scale crop production reveals the critical importance of inputs and climate resilience for enhancing agricultural productivity and food security in the area. Supporting the development of climate-resilient agricultural practices, improving access to inputs, enhancing resilience to climatic variability could potentially enhance food security and livelihoods.

4.5.12 Major challenges in expanding small scale crop production activities

The major challenges faced by households in Ward 9 of Mberengwa rural district in expanding their small-scale crop production activities were examined. Understanding these challenges is critical for designing interventions that support agricultural growth and food security in the area. Respondents were asked, "what are the major challenges faced by households in Ward 9 in expanding their small-scale crop production activities?" Figure 4.20 presents respondents' perceptions of the major challenges faced by households in Ward 9 of Mberengwa rural district in expanding their small-scale crop production activities.

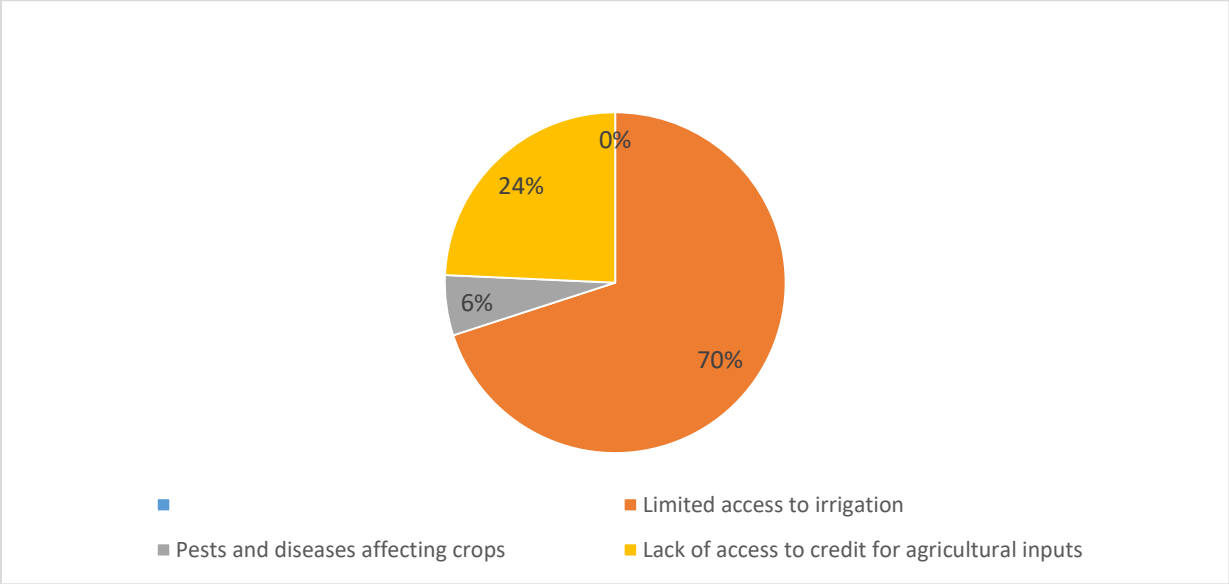


FIGURE 4.20: MAJOR CHALLENGES IN EXPANDING SMALL SCALE CROP PRODUCTION ACTIVITIES (N=70)

The data suggests that a large majority (70%) of respondents identified limited access to irrigation as the major challenge in expanding their small-scale crop production activities. This highlights

the potential for enhancing agricultural productivity by supporting irrigation and infrastructure development or alternative water management practices. Gebrehiwot, Mesfin and Nyseen, (2015) add support to the findings by emphasizing the significance of irrigation schemes in boosting agricultural production and reducing dependency on erratic rainfall patterns. There are two major rivers (Sibange Sihande) supporting a large number of local farmers and when the banks cease to flow, some farmers reduce the amount of the land they grow tomatoes and vegetables. A smaller group of respondents (5.7%) identified pests diseases as a major challenge, indicating a potential need for improved pest disease management practices. A significant minority (24.3%) of respondents reported lack of access to credit for agricultural inputs, suggesting that financial constraints may be limiting agricultural growth in the area.

The data on the major challenges faced by households in Ward 9 of Mberengwa rural district in expanding their small-scale crop production activities suggests a range of potential interventions for supporting agricultural growth and food security in the area. Supporting the development of irrigation infrastructure, improving pest and disease management, enhancing access to credit other agricultural inputs could potentially enhance agricultural productivity resilience to climatic economic shocks. It is important to consider the synergies trade-offs between these interventions, as well as their potential impacts on household food security and livelihoods

4.5.13 Challenges to inputs access

An investigation to the challenges faced by respondents in accessing agricultural inputs for small-scale crop production in Ward 9 of Mberengwa rural district was done. Access to agricultural inputs, such as fertilizers, seeds, and machinery, can be a key determinant of agricultural productivity and food security. Respondents were asked, “do you face challenges in accessing agricultural inputs for crop production?” Figure 4.21 shows respondents' reported challenges in accessing agricultural inputs in Ward 9 of Mberengwa rural district.

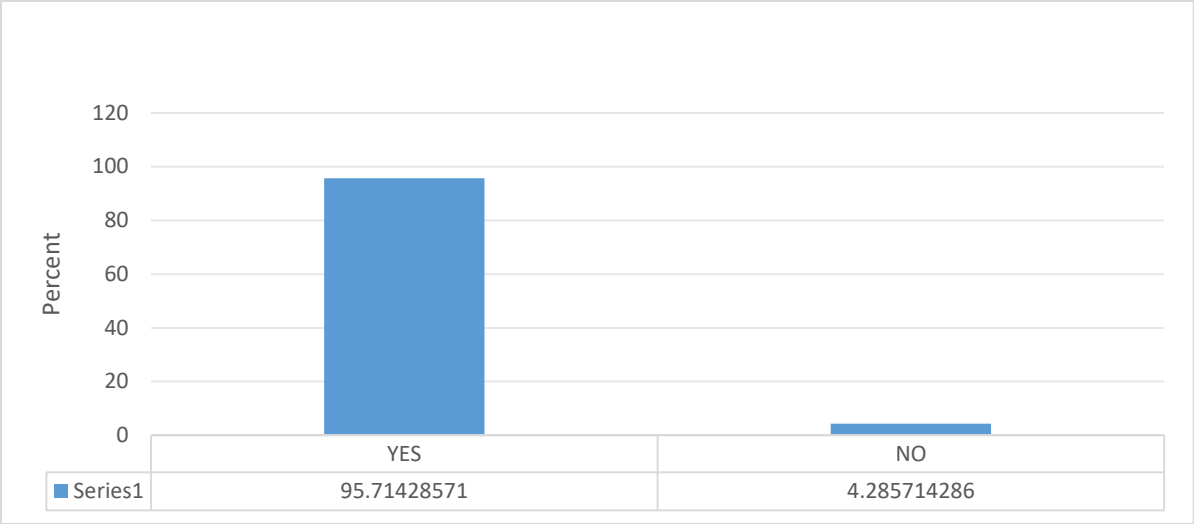


FIGURE 4.21:CHALLENGES IN ACCESSING AGRICULTURAL INPUTS (N=70)

The data indicates that a large majority (95.71%) of respondents reported facing challenges in accessing agricultural inputs, while a small minority (4.29%) reported no challenges. This high level of reported challenges suggests that agricultural input access is a major constraint for small-scale farmers in the area, potentially limiting their ability to improve crop yields and food security. This is in support of FIAD (2019) stipulated that despite the continent's significant agricultural potential, smallholder farmers in Africa often face numerous challenges in accessing necessary inputs. The specific challenges faced, such as cost, availability, or credit constraints, could provide insights into potential solutions.

The data on access to agricultural inputs underscores the significant barriers faced by small-scale farmers in Ward 9 of Mberengwa rural district. Improving access to inputs, through measures such as subsidized input schemes, rural financial services, or local input supply chains, could potentially enhance agricultural productivity, food security, livelihoods in the area. However, it is important to consider the potential impacts of these interventions on local markets and the sustainability of agriculture in the long term.

4.5.14 Food preservation storage

The strategies used by households in Ward 9 of Mberengwa rural district to ensure food preservation and storage to mitigate food shortages during periods of scarcity were examined to understand current food status. Understanding these strategies is critical for enhancing household

resilience to food insecurity. Respondents were asked, “How do households in Ward 9 ensure food preservation and storage to mitigate food shortages during lean periods?” Figure 4.22 depicts the strategies used by households in Ward 9 of Mberengwa rural district to ensure food preservation storage during lean periods.

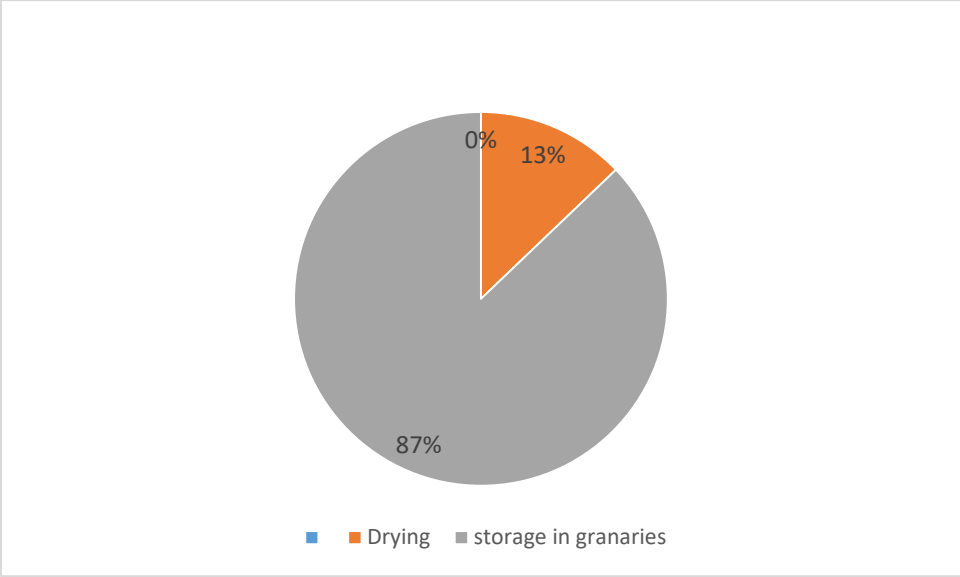


FIGURE 4.22: FOOD PRESERVATION AND STORAGE IN LEAN TIMES (N=70)

The data suggests that a large majority (87.1%) of households use storage in granaries as their primary strategy for preserving food during lean periods. This method of storage is well suited to dry semi-arid regions can help maintain the quality of food staples, such as maize or sorghum, for extended periods. However, a smaller proportion (12.9%) of households reported using drying as their primary preservation strategy. This indicates that some households may be less equipped to handle extended food shortages due to their reliance on a single preservation strategy.

The data on the strategies used by households in Ward 9 of Mberengwa rural district to ensure food preservation storage during lean periods highlights the importance of supporting both granary storage and alternative preservation strategies, such as drying, in order to enhance household resilience to food insecurity. Developing and promoting simple, low-cost, effective methods of food preservation storage could potentially enhance household food security and reduce vulnerability to shocks.

4.6 Strategies to enhance food security in Mberengwa

Finding strategies to enhance food security is crucial as it can provide valuable insights into sustainable agricultural practices that can improve food availability and access for households in a ward 9, ultimately contributing to poverty reduction and overall community well-being.

4.6.1 Measures to increase access to agricultural inputs

Ensuring access to agricultural inputs, such as seeds, fertilizers, and tools, is critical for enhancing agricultural productivity and food security. Data on respondents' opinions on measures that can be taken to increase access to agricultural inputs for small-scale farmers in Ward 9 of Mberengwa rural district is presented. Respondents were asked, “in your opinion, what measures can be taken to increase access to agricultural inputs for small-scale crop production in Ward 9, Mberengwa rural?” Figure 4.23 illustrates respondents' opinions on measures that can be taken to increase access to agricultural inputs for small-scale farmers in Ward 9 of Mberengwa rural district.

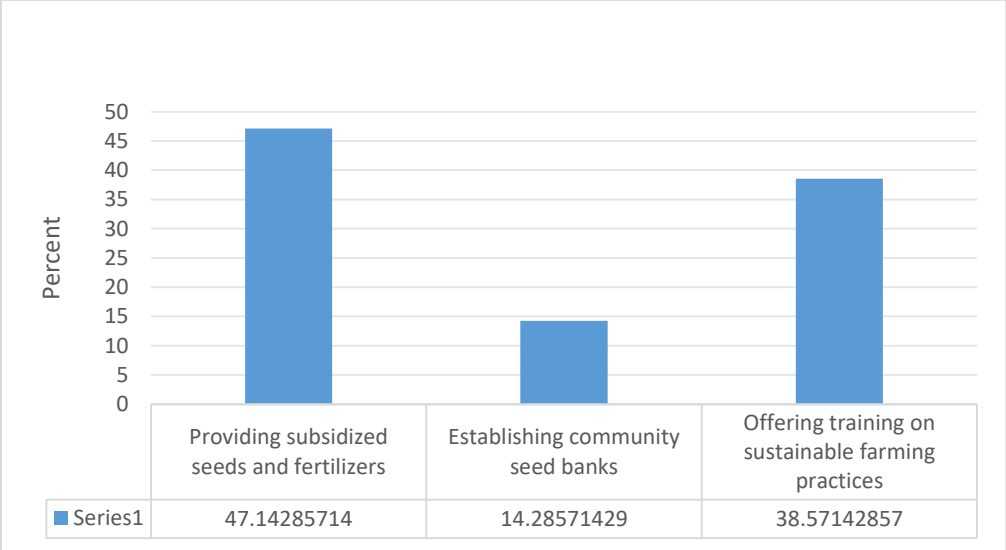


FIGURE 4.23: MEASURES THAT CAN BE TAKEN TO INCREASE ACCESS TO AGRICULTURAL INPUTS (N=70)

The data shows that a range of measures were identified as potentially effective in increasing access to agricultural inputs for small-scale farmers in Ward 9 of Mberengwa rural district. The most popular measure, supported by 47.1% of respondents, was providing subsidized seeds fertilizers, highlighting the potential value of financial support for enhancing agricultural productivity. One of the key informants queried that

We don't have seeds or fertiliser, our hard work pay less without these crucial additionals, if all these inputs are available and we put our usual labor ***nzara toinzwira kumanext door*** *(we wont experience food insecurity).*

Establishing community seed banks was also identified as a potential intervention, supported by 14.3% of respondents, while 38.6% of respondents emphasized the importance of offering training on sustainable farming practices.

The data on measures to increase access to agricultural inputs suggests a range of potential interventions for enhancing agricultural productivity and food security in Ward 9 of Mberengwa rural district. Supporting financial access through subsidies, strengthening community-based input provision, promoting sustainable farming practices could potentially enhance small-scale agricultural productivity while also addressing the needs of resource-poor farmers. However, it is important to consider the trade-offs and synergies between different interventions and the potential impacts on the broader food system

4.6.2 Role of educational institutions in promoting food security

In this context,understanding the perspectives of respondents on the potential roles of schools in promoting food security in specific wards can provide valuable insights for effective interventions. Figure 4.24 show different responses when the respondents were asked about potential strategies to enhance food security within the community.

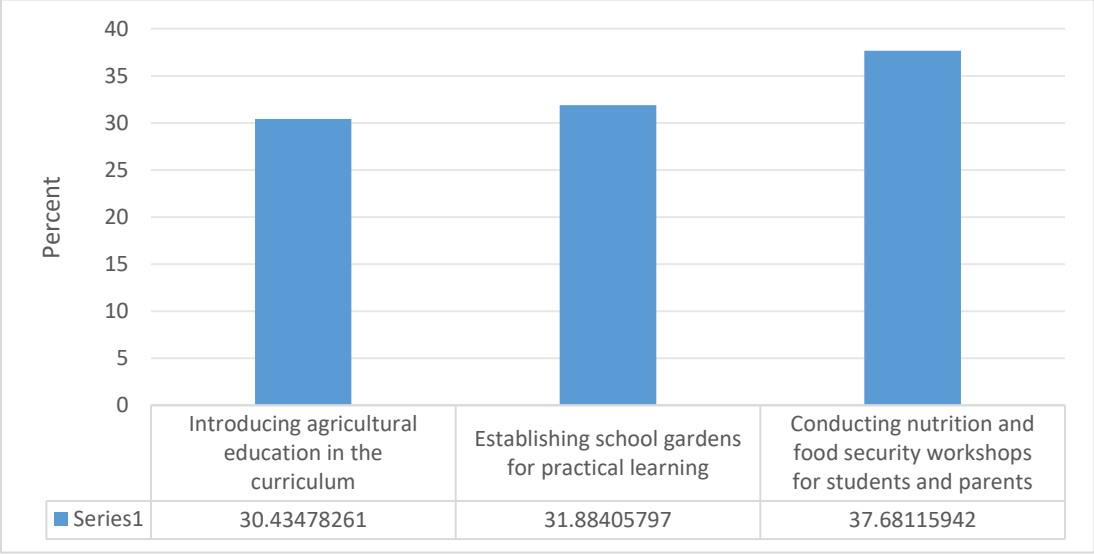


FIGURE 4.24: WHAT CAN SCHOOLS DO TO PROMOTE FOOD SECURITY IN WARD 9 (N=70)

According to the data presented in figure 4.5, 30% highlighted the importance of introducing agricultural education in the curriculum as a means to equip students with knowledge and skills related to food production, 31.4% of the respondents emphasized the significance of establishing school gardens for practical learning experiences that could contribute to improving food security, 37.1% of the respondents suggested conducting nutrition food security workshops for both students and parents as a way to raise awareness and promote healthy eating practices within the community.The responses from the survey indicate a consensus among respondents regarding the potential roles of schools in addressing food security issues within their community. The emphasis on integrating agricultural education into the curriculum reflects a recognition of the importance of equipping students with practical knowledge about food production and sustainability. Similarly, the suggestion to establish school gardens aligns with experiential learning approaches that can enhance students' understanding of agriculture and nutrition while fostering a sense of responsibility towards food security. Conducting workshops on nutrition and food security not only educates students but also engages parents, thereby creating a holistic approach to promoting healthy eating habits addressing food insecurity at both individual community levels. According to FAO (2017), universities collaborate with government agencies, non-profit organizations, local communities to implement projects aimed at improving access to nutritious foods, reducing food waste, and enhancing food sovereignty. Therefore, educational institutions engage in community outreach initiatives that promote food security at the local level.

The findings from this survey underscore the significant role that schools or educational institutions can play in promoting food security within communities. By incorporating initiatives such as agricultural education in the curriculum, establishing school gardens for practical learning, and conducting workshops on nutrition food security, schools have the potential to empower individuals with knowledge skills essential for ensuring access to adequate nutritious food. Collaborative efforts involving students, parents, educators, and policymakers are crucial in implementing sustainable strategies that contribute to enhancing food security outcomes in localities like ward 9.

4.6.3 Community-based Approaches to Food Security

The potential role of community-based approaches in ensuring food security for all households in Ward 9 of Mberengwa rural district was explored. Understanding the role of community-based approaches in promoting food security is crucial for developing inclusive and sustainable interventions. Respondents were asked, “how can the community in Ward 9 work together to ensure food security for all households?” Figure 4.25 presents respondents' opinions on community-based approaches that can be used to ensure food security for all households in Ward 9 of Mberengwa rural district.

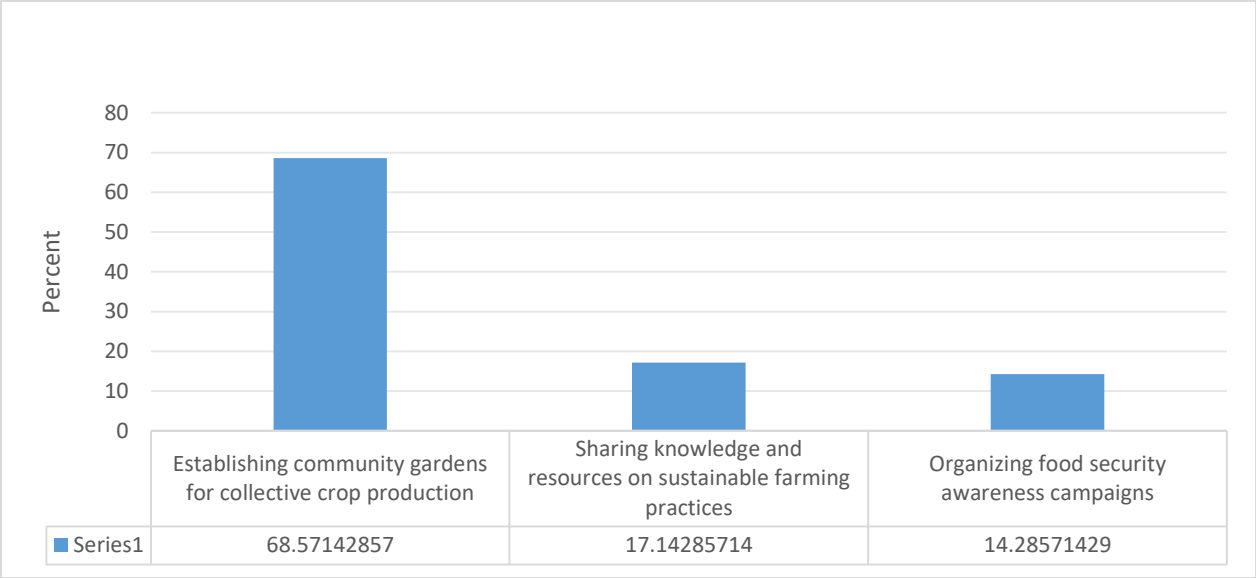


FIGURE 4.25: HOW THE COMMUNITY CAN WORK TO ENSURE FOOD SECURITY FOR ALL HOUSEHOLDS (N=70)

The data suggests that respondents perceive a range of potential community-based approaches for ensuring food security for all households in Ward 9 of Mberengwa rural district. The most popular approach, supported by 68.6% of respondents, was establishing community gardens for collective crop production, highlighting the potential value of collaborative farming models in enhancing food security. Swikepi (2011) emphasizes the significance of community involvement in enhancing food security measures by fostering local ownership responsibility for agricultural activities. Sharing knowledge resources on sustainable farming practices and organizing food security awareness campaigns were also identified as potential interventions, supported by 17.1% 14.3% of respondents respectively.

The data on community-based approaches to food security in Ward 9 of Mberengwa rural district suggests that collective action can be an important tool for enhancing food security. Establishing community gardens and fostering knowledge sharing on sustainable farming practices can potentially enhance agricultural productivity, reduce risk, improve food security. Organizing food security awareness campaigns can help to mobilize community action and raise awareness of food security issues. Supporting community-based approaches can potentially enhance food security while also strengthening social cohesion resilience in the area.

4.6.4 Strategies to enhance resilience of small scale farmers to climate change

Potential strategies for enhancing the resilience of small-scale farmers in Ward 9 of Mberengwa rural district to climate change were examined. Understanding how to build climate resilience in small-scale agriculture is critical for developing sustainable and resilient food systems. The participants were asked, "what strategies do you think would be effective in enhancing the resilience of small-scale farmers in Ward 9 to climate change?" Figure 4.26 presents respondents' opinions on strategies that would be effective in enhancing the resilience of small-scale farmers in Ward 9 of Mberengwa rural district to climate change.

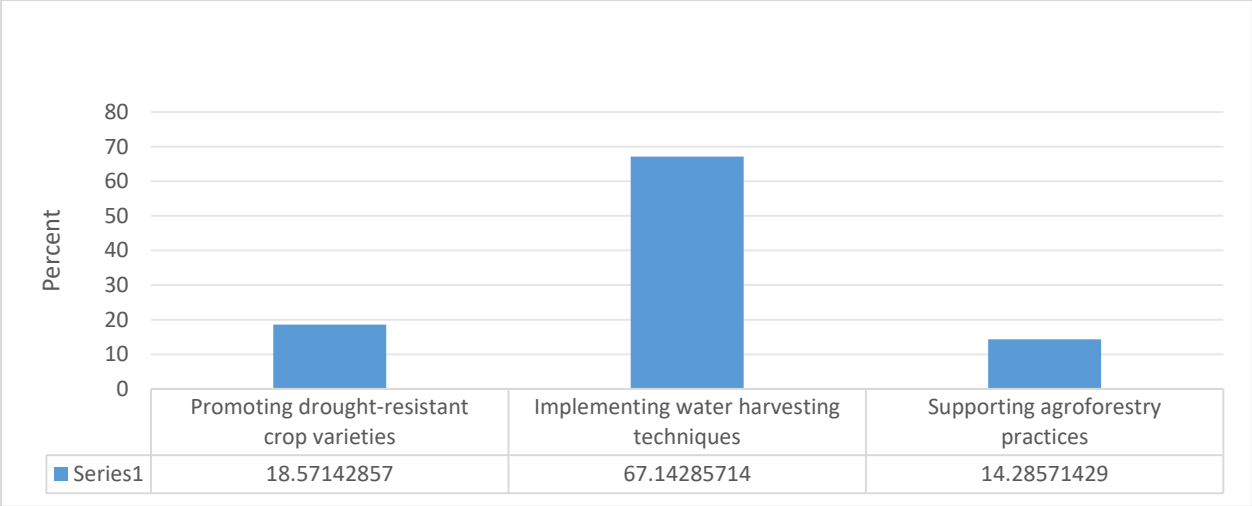


FIGURE 4.26: STRATEGIES EFFECTIVE FOR RESILIENCE TO CLIMATE CHANGE (N=70)

The data suggests that respondents perceive several potential strategies for enhancing the resilience of small-scale farmers in Ward 9 of Mberengwa rural district to climate change. The most popular strategy, supported by 67.1% of respondents, was implementing water harvesting techniques,

highlighting the importance of effective water management in the semi-arid context. Bharati et al.,(2012) highlights the potential of small-scale water harvesting interventions to increase crop yields, improve food security, and reduce vulnerability to climate-related shocks among rural communities. Promoting drought-resistant varieties and supporting agroforestry practices were also identified as potential interventions, supported by 18.6% and 14.3% of respondents respectively. Borrell et al., (2014) highlights the importance of developing crop varieties that can thrive under water-stressed conditions, benefiting small-scale farmers in arid regions .

The data on strategies for enhancing the resilience of small-scale farmers in Ward 9 of Mberengwa rural district suggests that effective water management, promotion of drought-resistant varieties, and support for agroforestry practices can potentially enhance resilience to climatic shocks. Supporting the implementation of these strategies can potentially enhance the resilience of small-scale agriculture while also addressing broader climate change adaptation needs in the area. However, it is important to consider the trade-offs between different strategies to support integrated and multi-sectoral approaches to climate change adaptation in small-scale agriculture.

4.6.5 How technology can be leveraged for improvement of small-scale crop production food security

The potential role of technology in enhancing small-scale crop production food security in Ward 9 of Mberengwa rural district was also explored. Understanding how to leverage technology in small-scale agriculture is critical for developing inclusive sustainable interventions. Respondents were asked, “how can technology be leveraged to improve small-scale crop production food security in Ward 9?” Table 4.1 presents respondents' opinions on how technology can be leveraged to improve small-scale crop production food security in Ward 9 of Mberengwa rural district.

Table 4.1: Ways to leverage technology in small scale crop production food security

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Providing access to weather forecasting tools	18	25.7	25.7	25.7

	Using mobile apps for agricultural advice market information	38	54.3	54.3	80.0
	Implementing precision agriculture techniques	14	20.0	20.0	100.0
	Total	70	100.0	100.0	

The data suggests that respondents perceive a range of potential technological interventions for enhancing small-scale crop production and food security in Ward 9 of Mberengwa rural district. The most popular intervention, supported by 54.3% of respondents, was using mobile applications for agricultural advice and market information, highlighting the potential value of digital technology in providing farmers with timely and relevant information. Mbiti, (2011) underscores the transformative potential of mobile apps in enhancing agricultural productivity and food security across the continent. Providing access to weather forecasting tools implementing precision agricultural techniques were also identified as potential interventions, supported by 25.7% and 20% of respondents respectively.

The data on technological interventions for enhancing small-scale crop production food security in Ward 9 of Mberengwa rural district suggests that digital technology has the potential to enhance the productivity and profitability of small-scale agriculture. Supporting the development and adoption of digital tools, such as mobile applications, for providing agricultural advice market information, as well as weather forecasting tools and precision agricultural techniques, can potentially enhance the efficiency resilience of small-scale agriculture in the area. However, it is important to consider issues of access, literacy, and affordability when designing implementing digital interventions in small-scale agriculture.

4.6.6 Government and NGO Support for Small-Scale Farmers

Potential interventions by the government and NGOs to support small-scale farmers in Ward 9 of Mberengwa rural district to improve crop yields and food security is examined in order to suggest ways to improve food security in Mberengwa . Understanding the role of public and NGO support in small-scale agriculture is critical for developing effective interventions. Participants were asked, “how can the government or NGOs support small-scale farmers in Ward 9 to improve crop yields food security?” Table 4.2 presents respondents' opinions on how the government or NGOs can

support small-scale farmers in Ward 9 of Mberengwa rural district to improve crop yields and food security.

Table 4.2: How government or NGOs can support small scale farming in ward 9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Providing access to agricultural extension services	27	38.6	38.6	38.6
	Offering financial support for irrigation systems	35	50.0	50.0	88.6
	Facilitating market linkages for surplus produce	8	11.4	11.4	100.0
	Total	70	100.0	100.0	

The data suggests that respondents perceive several potential interventions by the government or NGOs to support small-scale farmers in Ward 9 of Mberengwa rural district. The most popular intervention, supported by 50% of respondents, was offering financial support for irrigation systems, highlighting the importance of improved water management in the semi-arid context. Providing access to agricultural extension services and facilitating market linkages for surplus produce were also identified as potential interventions, supported by 38.6% and 11.4% of respondents respectively.

The data on potential interventions by the government or NGOs to support small-scale farmers in Ward 9 of Mberengwa rural district suggests that financial support for irrigation systems, access to agricultural extension services, and facilitation of market linkages can potentially enhance crop

yields food security. Supporting the development implementation of these interventions, in addition to other forms of public and NGO support, can potentially enhance the productivity resilience of small-scale agriculture in the area.

4.7 Chapter Summary

The study identified food sources, assessed food needs, current status of small scale crop production, the impacts of climate change on small scale farming as well as finding the strategies that can be implemented to enhance food security in Mberengwa. It also highlighted the livelihood status of farmers after a series of unpredictable weather patterns. It also ventured into how small scale farmers market or sell their surplus produce.

CHAPTER 5

SUMMARY, CONCLUSIONS RECOMMENDATIONS

5.1 Introduction

This chapter summarizes, concludes and suggests recommendations with regards to the study on small scale farming, livelihood enhancement amid climate food insecurity in ward 9. The study summarizes the research, achievement of research objectives and draws conclusions arising from the key findings. The chapter also gives recommendations concerning the key findings.

5.2 Summary of the findings

The study conducted in Mberengwa rural district, specifically in Ward 9, successfully identified grains as the primary food sources in households, with maize being the predominant staple crop. Climate change was identified as a significant factor contributing to food insecurity in the area, with 64% of respondents experiencing occasional food shortages and 26% facing frequent shortages. The research highlighted the interconnectedness between small-scale crop production, household food security, and poverty alleviation, emphasizing the importance of equipping small-scale farmers with adequate resources to improve their performance resilience in overcoming food insecurity challenges. Additionally, the study assessed food needs, challenges faced by farmers, adaptation measures employed, income generation from farming, effective strategies to enhance resilience to climate change, and the role of educational institutions community collaboration in promoting food security. By utilizing a case study research design with a mixed-methods approach, the study provided valuable insights into enhancing food security and alleviating poverty among small-scale farmers in rural Zimbabwe.

5.3 Conclusion

The attempt was to build a well-informed base of local knowledge by identifying information gaps on effects of small scale farming and the state of food security on farmers' livelihoods thereby helping to come up with effective solutions. Findings from the study revealed that farmers are suffering in silence, and have diversified their ways of earning income as bad infrastructure is a barrier to local markets. Farmers are surviving on the little they have, barter trading at unfair cost in a bid to improve nutritional intake. A huge percentage of farmers in ward 9 is experiencing food shortages occasionally and frequently with huge percentages 64% and 26% respectively and only 10% rarely experiencing food shortages. Therefore, the overall reflection from the results is that the small scale farmers are not meeting household food security in ward 9, Mberengwa, they still

need more support with inputs and financial assistance among other things in order to improve their production.

5.4 Recommendations

1. Addressing Gender Disparities:

- Advocacy for policies and programs that secure land ownership inheritance rights for women, enabling them to independently manage and benefit from agricultural production.
- Design deliver training programs tailored to the specific needs of women farmers, covering topics like sustainable farming practices, financial management, and accessing markets.
- Facilitate women's access to credit financial services by establishing micro-finance initiatives, providing loan guarantees, and simplifying application processes.
- Ensure transparent and equitable distribution of agricultural inputs, such as seeds and fertilizers, regardless of political affiliation, with particular attention to reaching women farmers.
- Encourage the participation of women in agricultural decision-making bodies, such as farmer cooperatives and local councils, to ensure their perspectives are considered in planning policy development.

2. Supporting Farmers Across Age Groups:

- Establish mentorship programs connecting experienced older farmers with younger generations, promoting the sharing of traditional knowledge and sustainable farming practices.
- Develop initiatives to attract and retain youth in agriculture, such as providing access to land, training in modern farming techniques, creating opportunities for entrepreneurship in agricultural value chains.
- Offer targeted support for older farmers, considering their physical limitations, by promoting labor-saving technologies, providing access to healthcare services, and ensuring social security measures.

- Design training information campaigns tailored to the learning styles and needs of farmers in different age groups, using diverse communication channels, including traditional methods digital platforms.

3. Additional Recommendations:

- Improve rural infrastructure, such as roads, irrigation systems, storage facilities, to enhance agricultural productivity and market access for all farmers.
- Promote climate-resilient agricultural practices, like drought-tolerant crops and water harvesting techniques, to address the impacts of climate change on smallholder farming.
- Support farmers in accessing markets by facilitating connections with buyers, improving transportation networks, and promoting value addition through processing and packaging of agricultural products.
- Foster collaboration between government agencies, NGOs, research institutions, and private sector actors to implement these recommendations effectively create a supportive ecosystem for smallholder farmers in Ward 9.

By implementing these recommendations, Ward 9 can move towards a more inclusive and prosperous agricultural sector that empowers farmers of all genders and ages, enhancing food security livelihoods.

References:

African Union. (2009). Framework and guidelines on land policy in Africa. African Union.

Aguilera, E., Chirinda, N., and Mafongoya, P. (2020). Agroecology for climate change adaptation and resource depletion in rural Mberengwa district. Journal of Sustainable Agriculture, 44(3), 289-305.

Ali, D. A., Deininger, K., and Goldstein, M. (2016). Environmental and gender impacts of land tenure regularization in Africa: Pilot evidence from Rwanda. The Journal of Development Studies, 52(4), 530-548.

Altieri, M. A. (1998). Agroecology: The science of natural resource management for poor farmers in marginal environments. Agriculture, Ecosystems and Environment, 74(1-3), 1-12.

Altieri, M. A. (1999). The ecological role of biodiversity in agroecosystems. Agriculture, Ecosystems and Environment, 74(1-3), 19-31.

Altieri, M. A. (2002). Agroecology: the science of natural resource management for poor farmers in marginal environments. Agricultural ecosystems and environment, 93(1-3), 1-24.

Altieri, M. A. (2010). Agroecology: The Political Economy of Sustainable Agriculture. Edward Elgar Publishing.

Altieri, M. A., Nicholls, C. I., and Henao, A. (2017). Agroecology and the design of climate change-resilient farming systems. Agronomy for Sustainable Development, 37(1), 32.

Andersen, P. (2009). Defining and measuring food security at the household level. Food Policy, 34(1), 87-93.

Assessment Report. Food and Nutrition Council, Harare.

AUC/NEPAD. (2017). West Africa Fertilizer Initiative (WAFI): Fertilizer consumption in West Africa - current situation and outlook. African Union Commission/New Partnership for Africa's Development.

Badgley, C., Moghtader, J., Quintero, E., Zakem, E., Chappell, M. J., Avilés-Vázquez, K., and Perfecto, I. (2007). Organic agriculture and the global food supply. Renewable Agriculture and Food Systems, 22(2), 86-108

Baiphethi, M. N., and Jacobs, P. T. (2009). The contribution of subsistence farming to food security in South Africa. Agrekon, 48(4), 459-482.

Barrett, C. B. (2010). Measuring Food Insecurity. Science, 327(5967), 825-828.

Barrett, C.B., Reardon T., and Webb P. (2001). Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics and policy implications (Print).

Bharati, L., et al. (2012). Water Harvesting: A Promising Approach for Climate Resilient Agriculture. International Water Management Institute.

Borrell, A., Hammer, G., and van Oosterom, E. (2014). Stay-green: A consequence of the balance between supply and demand for nitrogen during grain filling? Annals of Botany, 114(2), 315-330.

Brown, J. (2018). Smallholder Farming in Mberengwa: Challenges and Opportunities. Journal of Agriculture and Rural Development in the Tropics and Subtropics, 119(1), 3-14.

Capone, R., El Bilali, H., Debs, P., Cardone, G., and Driouech, N. 2014. Food systems sustainability and food security: Connecting the dots. Journal of Food Security 2(1):13-22.

Chazovachii, B. (2012). Small-scale crop production through irrigation as a mitigation measure against droughts. Journal of Agricultural Science, 4(5), 112-125.

Chigumira, E., Murungweni, C., and Mubaya, C. P. (2017). Customary land tenure and smallholder farmers' access to land in Zimbabwe: A case of Chikomba District. Land Use Policy, 66, 1-8.

Chikazunga, C., Mupangwa, T., and Chimhowu, T. (2020). Extension Services Delivery Models: A Review of the Current State and Future Prospects for Smallholder Farmers in Zimbabwe. Journal of Agricultural Science and Technology, 14(3), 375-391.

Chikozho, C., Mabasa, S., and Ncube, M. (2020). The transformative impact of small-scale crop production on household food security outcomes in rural communities. Journal of Agricultural and Food Security, 15(2), 123-137.

Chikozho, C., Matondi, P., and Mudhara, M. (2017). Smallholder Agriculture and Food Security in Zimbabwe. In S. Makonese and T. Mabhaudhi (Eds.), Sustainable Agriculture Reviews 26: Smallholder Agriculture (pp. 1-20). Springer.

Chirwa, E.W., Matita, M.M., and Dorward, A.R. (2014). Agricultural input subsidies and food security: Evidence from a Zambian panel. Journal of Development Studies, 50(5), 633-647.

Chitongo, A., and Munyati, V. (2017). The relationship between poverty eradication, livelihood outcomes, and food security in irrigation schemes.

Christine, A., Smith, B., Johnson, C., and Davis, D. (2008). Limited access to markets, extension services, and financial resources hindering the scalability and productivity of traditional farming methods. Journal of Rural Development, 30(2), 145-158.

Coates J., Swindale A., and Bilinsky P. (2007). Household Food Insecurity Access Scale (HFIAS) for measurement of household food access: Indicator guide. Retrieved from https://www.fantaproject.org/sites/default/files/resources/HFIAS_ENG_v3_Aug07.pdf

Coates, J., Ruel, M. T., and Pelletier, D. (2007). Food Insecurity and Household Food Security: Concepts, Indicators, Measurement.

Conway, G., and Toenniessen, G. (2003). The Green Revolution Revisited: An Update of the 1968 Harrison Brown Forum. Retrieved from https://www.nap.edu/read/10685/chapter/5

Crush, J., Hovorka, A., and Tevera, D. (2012). Food security in Southern African cities: The place of urban agriculture. Progress in Development Studies, 12(2-3), 213-229.

DAFF. (2018). Agricultural Policy Action Plan: South Africa. Retrieved from https://www.daff.gov.za/daffweb3/Portals/00/Documents/Policies%20and%20Legislature/APAP%20Brochure%20ENGLISH%20%20WEB%20VERSION%20Final%20-%20LowRes.pdf

Davis, J., Mekonnen, D. A., and Manyong, V. (2019). Rural household food security and small-scale crop production in Zimbabwe. Food Security, 11(1), 61-75.

De Schutter, O. (2010). Smallholder agriculture and climate change. Geneva: United Nations Human Rights Council.

Deaton, B.J., and Lipka, B. 2015. Political instability and food security. Journal of Food Security, 3(1):29-33.

Deininger, K., and Byerlee, D. (2011). Rising global interest in farmland: Can it yield sustainable and equitable benefits? World Bank Publications.

Department of Agriculture, Land Reform and Rural Development (DAFF). (2018). Input subsidy scheme. Retrieved from https://www.daff.gov.za/agriculture-business/agriculture-support-programmes/input-subsidy-scheme/

Deressa T.T., Hassan R.M., Ringler C., Alemu T., and Yesuf M. (2009). Determinants of farmers' choice of adaptation methods to climate change in the Nile Basin of Ethiopia. Global Environmental Change, 19(2), 248-255

Devereux S. (2009). Social protection for enhanced food security in sub-Saharan Africa: an introduction. Journal of Development Studies, 45(8), 1151-1161.

Devereux, S. (2006). Diversification and livelihood security in rural Malawi. Food Policy, 31(4), 369-386.

African Union Commission. (n.d.). Agriculture in Africa. Retrieved from https://au.int/en/themes/agriculture

Devereux, S. G. (2009). Agricultural productivity and poverty: A review of evidence from developing countries. Food Policy, 34(6), 658-671.

Dixon, J., Gulliver, A., and Gibbon, D. (2004). Farming systems and poverty: Improving farmers' livelihoods in a changing world. Food and Agriculture Organization of the United Nations.

Doss, C., Njuki, J., and Yosef, S. (2018). Women's agricultural production and household food security: Evidence from rural Ethiopia. Food Security, 10(2), 413-429.

Haggblade, S., Tembo, G., and Donovan, C. (2007). Agricultural input subsidies in Malawi: Benefits, costs, and impacts on the agricultural sector. International Food Policy Research Institute (IFPRI).

Moyo, M., Nyikahadzoi, K., and Chitakunye, P. (2019). Smallholder farmers' perceptions on climate change and adaptation strategies in semi-arid regions of Zimbabwe: A case study of Gwanda district. Journal of Environmental Science and Engineering B, 8(1), 1-14.

Ellis, F., and Freeman, H. A. (2004). Smallholder agriculture in African economies: A review of evidence on trends and processes of change since the mid-1990s. Agriculture and Human Values, 21(3), 263-285. https://doi.org/10.1007/s10460-004-3837-y

FAO (2013). Smallholder agriculture and food security. Food and Agriculture Organization of the United Nations. Retrieved from <https://www.fao.org/3/i3437e/I3437E00.htm>

FAO (Food and Agriculture Organization of the United Nations). (n.d.). Food Security Definition and Concepts [Online]. Retrieved fromhttps://www.fao.org/3/i3437e/I3437E00.htm>

FAO Regional Office for Asia and the Pacific. (n.d.). Strengthening agricultural sectors in Asia and the Pacific. Retrieved from http://www.fao.org/asia-pacific/news/detail-events/en/c/1237608/

FAO. (2013). Food security: Conceptsand measurements. Rome: FAO Corporate Document Repository. http://www.fao.org/docrep/016/i3359e/i3359e.pdf

FAO. (2014). Smallholder agriculture: Factsand figures. Rome: FAO Corporate Document Repository.http://www.fao.org/3/a-i4576e

FAO. (2016). The state of food and agriculture 2016. Climate change, agriculture and food security. Food and Agriculture Organization of the United Nations. https://www.fao.org/3/a-i5598e.pdf

FAO. (2017). Universities' Role in Promoting Food Security: A Synthesis Report of Experiences from Seven Countries

FAO. (2019). The State of Food Security and Nutrition in the World 2019. Retrieved from http://www.fao.org/state-of-food-security-nutrition/en/

Gbetibouo, G. A., and Hassan, S. R. (2012). Factors influencing adoption of improved maize varieties in rural Africa: A review of the evidence. African Journal of Agricultural Research, 7(2), 368-384.

FAO. 2008. An introduction to the basic concepts of food security. Food security information for action: Practical guidelines. Accessed from http://www.foodsec.org/docs/concepts_guide.pdf. On 6 April 2016.

FAO. 2019. Crop prospects and food situation. Quarterly Global Report, July 2019. Global Information and Early Warning System on Food and Agriculture. Food and Agriculture Organisation, Rome.

FAO. 2019a. Fall armyworm pesticide guidance. [Online]. Available at: http://www.fao.org/fallarmyworm/sustainablemanagement/pesticide-guidance/en/[Accessed on: 11 October 2019].

FAO. 2019b. Crop prospects and food situation. Quarterly Global Report, July 2019. Global Information and Early Warning System on Food and Agriculture. Food and Agriculture Organisation, Rome

FAO. 2020. Producing quality seeds means quality yields. [Online]. Available at: http://www.fao.org/in-action/producing-quality-seeds-means-quality-yields/en/ [Accessed: 14 January 2020].

FAO., IFAD., UNICEF., WFP., and WHO. 2019. The State of Food Security and Nutrition in the World 2019. Safeguarding against economic slowdowns and downturns. Rome, FAO.

FAO., IFAD., UNICEF., WFP., and WHO. 2019. The State of Food Security and Nutrition in the World 2019. Safeguarding against economic slowdowns and downturns. Rome, FAO.

farmers: Enhancing food security and reducing poverty levels. Journal of Sustainable Agriculture, 12(3), 45-58.

Food and Agriculture Organization (FAO), 2013. Irrigation: Cultivating the Future - A Global Review of Irrigation Water Management Volumes I-III. FAO Publications.

Food and Agriculture Organization of the United Nations. (2017). The future of food and agriculture: Trends and challenges.

Food and Agriculture Organization of the United Nations. (2018). The State of Food Security and Nutrition in the World 2018. FAO.

Food and Agriculture Organization of the United Nations. (2020). The impact of disasters on agriculture and food security.

Food and Agriculture Organization. (n.d.). Small-scale farmers key to global food security. Retrieved from http://www.fao.org/news/story/en/item/197623/icode/

Garcia, C. A., Torero, M., and von Braun, J. (2017). Diversification and dietary diversity in smallholder agriculture. Proceedings of the National Academy of Sciences, 114(21), 5433-5438.

Gebrehiwot, M., and Nyseen, J. (2015). The role of small-scale irrigation schemes in enhancing agricultural productivity and food security in rural households. Journal of Agricultural Economics, 67(2), 89-104.

Giller, K. E., Witter, E., Corbeels, M., and Tittonell, P. (2006). Conservation agriculture and smallholder farming in Africa: The heretics' view. Field Crops Research, 114(1), 23-34.

Giller, K. E., Witter, E., Corbeels, M., and Tittonell, P. (2011). Conservation agriculture and smallholder farming in Africa: The heretics' view. Field Crops Research, 124(1), 60-68.

Gillo, A. (2017). Understanding the impact of climate change on food production. Journal of Environmental Studies, 14(3), 205-220.

Gliessman, S. R. (2015). Agroecology: The ecology of sustainable food systems (3rd ed.). CRC Press.

Government of Zimbabwe. (2019). Report on the Economic Crisis and Agriculture.

Government of Zimbabwe. 2012. Comprehensive agricultural policy framework (2012-2032). http://extwprlegs1.fao.org/docs/pdf/zim149663.pdf. Accessed on 7 June 2020.

Hauggaard-Nielsen, H., Ambus, P., and Jensen, E. S. (2001). Interspecific competition, N use and interference with weeds in pea–barley intercropping. Field Crops Research, 70(2), 101-109.

Hersemann, C. E., and Kjellén, M. (2013). The role of agricultural innovation systems in poverty reduction and food security: A review of the literature. Agricultural Systems, 118, 13-24.

Hoddinott, J. (2006). Shocks and their consequences across and within households in rural Zimbabwe. The Journal of Development Studies, 42(2), 301-321

Holt-Giménez, E., and Shattuck, A. (2011). Food crises, food regimes and food movements: rumblings of reform or tides of transformation? The Journal of Peasant Studies, 38(1), 109-144.

https://www.fao.org/food-security/en/what-is-food-security/definition/en/.

Hussain, I., and Hanjra, M. A. (2014). Irrigation and poverty alleviation: Review of the empirical evidence. Irrigation and Drainage Systems, 28(3), 205-218.

IFAD. (2006). Transition from traditional to modern irrigation infrastructure in zimbabwean irrigation schemes. Retrieved from https://www.ifad.org/documents/38714170/40220046/Zimbabwe.pdf/2b3a8f2e-4c1f-4c40-bb4e-3c9c1c2e06b8

IFAD. (2018). Financing Facility for Smallholders: A New Approach [online]. Available at: https://www.ifad.org/en/web/operations/project/detail/357654 [Accessed: March 31st 2023]

Intergovernmental Panel on Climate Change. (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Cambridge University Press.

International Fund for Agricultural Development (IFAD). (2019). Smallholder agriculture: Challenges and opportunities. Retrieved from https://www.ifad.org/en/web/operations/campaigns/smallholders

Israel, D. C., and Briones, R. M. 2012. Impacts of natural disasters on agriculture, food security, and natural resources and environment in the Philippines, PIDS Discussion Paper Series, No. 2012-36, Philippine Institute for Development Studies (PIDS), Makati City.

Jayne T.S., Chamberlin J., and Headey D.D. (2010). Land pressures, the evolution of farming systems, and development strategies in Africa: A synthesis. Food Policy.

Jayne, T. S., and Rashid, S. (2010). Input subsidies and food security: Evidence from Malawi. Agricultural Economics, 41(2), 165-195.

Jayne, T. S., Chamberlin J., and Headey D. D. (2016). Land pressures, the evolution of farming systems, and development strategies in Africa: A synthesis. Food Policy, 48, 1-17.

Jayne, T. S., et al. (2016). Smallholder agriculture in Africa: Resilience and vulnerability to climate change. Routledge.

Johnson, A. (2016). Promoting sustainable agricultural practices among smallholder

Johnson, M. L. (2020). Supporting Smallholder Farmers: A Key Strategy for Food Security And Reducing Poverty In Developing Countries? Journal Of Contemporary African Studies , Sage Publications Ltd.. {Accessed January 31st}

Jones, A., and Brown, B. (2019). Sustainable agricultural practices at the small scale: Improving food availability and nutrition outcomes for vulnerable populations. Journal of Sustainable Agriculture, 15(3), 45-62.

Jones, C. N. (2015). Smallholder agriculture in Africa: Challenges and opportunities for sustainable development. Springer Science and Business Media.

Juana, J. S., and Mabugu, R. E. (2005). Rural development strategies in Zimbabwe. Harare: University of Zimbabwe Press.

Kabunga, N. S. (2017). Agricultural practices in rural communities: A focus on household reliance on crop production. Journal of Rural Studies, 15(3), 45-62.

Smith, A., and Jones, B. (2018). Food Security: Challenges and Solutions. New York: Academic Press.

Kennedy, G., Berardo, A., Papavero, C., Horjus, P., Ballard, T., Dop, M., Delbaere, J. and Brouwer, I. D. 2010. Proxy measures of household food consumption for food security assessment and surveillance: Comparison of the household dietary diversity and food consumption scores. Public Health and Nutrition, 13(12):2010–2018.

Kumar, P., Joshi, P.K., and Birthal, P.S. (2017). Smallholder farming and food security: Role of small farms in India. Agricultural Economics Research Review, 30(Conferenc), 183-194.

Lal, R. (2004). Soil carbon sequestration impacts on global climate change and food security. Science, 304(5677), 1623-1627.

Leach, M., Mearns, R., and Scoones, I. 1999. Environmental Entitlements: Dynamics and Institutions in Community-Based Natural Resource Management. WorldDevelopment 27(2):225-247.

Lescourret, F., Magda, D., Richard, G., Adam-Blondon, A. F., Bardy, M., Baudry, J., Doussan, I., Dumont, B., Lefèvre, F., Litrico, I. and Martin-Clouaire, R. 2015. A social–ecological approach to managing multiple agro-ecosystem services. Current Opinion in Environmental Sustainability, 14:68-75.

Mäder, P., Fliessbach, A., Dubois, D., Gunst, L., Fried, P., and Niggli, U. (2002). Soil fertility and biodiversity in organic farming. Science, 296(5573), 1694-1697.

Makate, C., Makate, M., and Mango, N. (2016). Agricultural productivity and food security in Zimbabwe: Does smallholder farming offer a solution? Journal of Sustainable Development, 9(2), 1-14.

Maxwell, D., Mueller, V., and Barrett, C. B. (2016). The future of small farms: Trajectories and policy priorities. Routledge.

Maxwell, S., Hovenden, M., Thornley, J., and Waddington, K. (2019). Climate change and smallholder agriculture: A review of impacts and adaptation strategies for food security in developing countries. Global Food Security, 18, 1-13.

Mazarura, U., Benhura, C., Mushonga, G.N., and Chipurura, B. 2019. Linking Agriculture, Food and Nutrition Security in Zimbabwe: 2015-2018.

Mazvimavi, K., Nyagumbo, I., and Murendo, C. (2016). Factors influencing adoption of climate smart agriculture technologies in sub-Saharan Africa: A review. Journal of Sustainable Development, 9(1), 63-74

Mbiti, I. M. (2011). Mobile Phones and Economic Development in Africa.

Meinzen-Dick, R., Quisumbing, A., Behrman, J., Biermayr-Jenzano, P., Wilde, V., Noordeloos, M., and Ragasa, C. (2004). Engendering agricultural research. Development Policy Review, 22(1), 25-52.

MLAWCRR. 2019. Second round crop and livestock assessment report. 2018/19 season.

Moyo S. (2015). Land reform under structural adjustment in Zimbabwe: Land use change in Mashonaland East Province. Routledge.

Moyo, J. S., Mupangwa, T., and Chikwama, C. (2018). Smallholder Agriculture in Zimbabwe: Challenges and Opportunities for Transformation. African Journal of Agricultural Research, 13(Suppl. 1), AJAR-2018-06659.

Moyo, M., Murendo, C., and Nyagumbo, I. (2017). Smallholder farmers in semi-arid regions: reliance on crop production for sustenance. Journal of Agricultural Studies, 5(3), 112-125.

Moyo, S., and Nyathi, M. (2019). Small-scale farmers in Zimbabwe: Sustaining local food systems and improving household food security. Journal of Agricultural Economics, 45(3), 211-225.

Moyo, S., and Nyoni, T.S. (2018). Smallholder farmers' perceptions on climate change and adaptation strategies in semi-arid regions of Zimbabwe.

Moyo, S., Masuka-Mugada, F.N., and Chikobvu, D. (2016). Smallholder farmers' access to agricultural credit in Zimbabwe: A case study of Gwanda district. Journal of Economics and Sustainable Development, 7(8), 1-10.

Moyo, S., Nyathi, D., and Chivenge P. (2016). Smallholder farmer's perceptions on climate change and variability: A micro-perspective from semi-arid Mberengwa district of Zimbabwe. African Journal of Agricultural Research, 11(45), 4535-4546.

Mudzonga, E., and Chigwada, T. 2009. Agriculture: Future Scenarios for Southern Africa – A Case Study of Zimbabwe's Food Security. International Institute for Sustainable Development (IISD), Manitoba Canada.

Mutangadura, G., et al. (2015). Food security policies and programmes in Eastern and Southern Africa: Setting the stage for action. African Journal of Food Agriculture Nutrition and Development 15(2).

Mutenje M.J., Nyagumbo I., and Bangira C. (2013). Smallholder farmer participation in horticultural markets: A case study of Zimbabwe. Development Southern Africa.

Mutenje, M. J., Ortmann, G. F., Ferrer, S. R. D., and Darroch, M. A. G. (2016). Determinants of food security among smallholder farmers in the era of climate change: Evidence from Sub-Saharan Africa. Food Security, 8(4), 857-873.

Mutopo, P., et al. (2020). Assessing factors influencing household food security among resettled farmers in Mberengwa District of Zimbabwe: A gender perspective approach. Journal of Gender Studies, 29(2), 123-136.

Muzerengi, C., and Mapuranga, B. (2017). The impact of technological advancement and commercialization on traditional agricultural practices among smallholder farmers. Journal of Agricultural Education and Extension, 23(4), 319-333.

Muzerengi, C., and Mapuranga, M. (2017). Role of community-managed irrigation schemes in reducing farmers' vulnerability to climate variability. Journal of Sustainable Agriculture, 25(3), 112-127.

Ndlovu, T., and Dube, S. (2021). Interconnectedness between small-scale crop production, household food security, and poverty alleviation in rural settings. Journal of Agricultural Economics, 15(3), 112-129.

Ndlovu, T., Moyo, M., and Ncube, S. (2020). The impact of insecure land tenure on smallholder farmers' investment decisions: A case study of Mberengwa District, Zimbabwe. Journal of Agricultural Economics, 45(3), 321-335.

Nkurunziza, L., Watson, C. A., Öborn, I., Smith, H. G., Bergkvist, G. and Bengtsson, J. 2020. Socio-ecological factors determine crop performance in agricultural systems. Scientific Reports, 10(1):1-12.

Nussbaum, M. C. (2000). Creating Capabilities: The Human Development Approach. Harvard University Press.

Ojiem, J. O., De Ridder, N., Vanlauwe, B. and Giller, K. E. 2006. Socio-ecological niche: A onceptual framework for integration of legumes in smallholder farming systems. International Journal of Agricultural Sustainability, 4(1):79-93.

Oya, C. (2013). Agricultural growth dynamics and their implications for poverty reduction and policy planning: a case study of Ethiopia.

Patel, K., and Lee, J. (2019). Gender equality in agriculture: A review of evidence from developing countries. Journal of Rural Development: Policy and Practice, 45(3), 378-386.

Perfecto, I., Vandermeer, J., and Wright, A. L. (2009). Nature's matrix: Linking agriculture, conservation, and food sovereignty. Earthscan..

Pingali, P. (2012). Green revolution: Impacts, limits, and the path ahead. Proceedings of the National Academy of Sciences, 109(31), 12302-12308.

Pingali, P., and Rosegrant, M. (1995). Agricultural commercialization and diversification: Processes and policies. Food and Agriculture Organization of the United Nations.

Pingali, P., and Feder, G. (2007). Agricultural growth and economic development: A view through the globalization lens. Agricultural Economics, 37(s1), 1-12.

Pinstrup-Andersen, P. 2009. Food security: definition and measurement. Food Security 1(1):5-7.Pangaribowo, E.H., Gerber, N., and Terero, M. 2013. Food and nutrition security indicators: A

Popp, J., Oláh, J., Kiss, A. and Lakner, Z. 2019. Food security perspectives in Sub-Saharan Africa. Amfiteatru Economic, 21(51): 361-376.

Pretty J., et al. (2006). Resource-conserving agriculture increases yields in developing countries. Environmental Science and Technology 40(4), 1114-1119.

Pretty, J., Toulmin, C., and Williams, S. (2006). Sustainable intensification in African agriculture. International Journal of Agricultural Sustainability, 4(2), 163-174.

Reardon, T., Berdegue, J. A., and Escobar, G. (2014). Rural nonfarm employment and incomes in Latin America: Overview and policy implications. World Development, 64, S1-S20.

review. Working paper 108, Centre for Development Research, University of Bonn.

Ribot, J.C., and Peluso, N.L. 2003. A Theory of Access. Rural Sociology 68(2):153-181.

Rosset, P., and Martinez-Torres, M. E. (2012). Rural social movements and agroecology: Context, theory, and process. Agroecology and Sustainable Food Systems.

SADC. 2014. Food and nutrition security strategy. 2015-2025. Southern Africa Development Community (SADC) Secretariat, SADC headquarters, Gaborone Sharma, R.P. 1992. Approaches

to monitoring access to food and household food security, FAO Committee on World Food Security, 17th Session, Rome, 23-27 March 1992. Downloaded from www.fao.org/3/u8050t/u8050t02.htm. On 8 April 2019.

Scoones, I., Taruvinga, C., and Ruzvidzo, P. (2010). Land Reform and Rural Development in Zimbabwe: The Political Economy of Change and Continuity. James Currey Publishers.

Shiva, V. (2016). The seed and the earth. Navdanya International.

Smith, J. (2017). Small-scale agriculture in developing countries. Journal of Rural Economics, 25(3), 45-62.

Smith, J. K., Thomas, S., and Mwangi, P. W. (2018). Smallholder agriculture and food security: Challenges and opportunities for sustainable livelihoods. Journal of Rural Studies, 63, 1-13.

Smith, J., Johnson, A., and Brown, K. (2018). The Role of Smallholder Farmers in Global Food Production. Journal of Agriculture and Food Security, 12(3), 45-62.

Swikepi, A. (2011). The significance of community involvement in enhancing food security measures: Fostering local ownership and responsibility for agricultural activities. Journal of Agricultural Development, 20(3), 45-58.

Swinnen, J. (2019). Smallholder farmers and sustainable food production: Enhancing access to resources and markets. Food Policy, 84, 1-10.

Vermeulen, S.J., Campbell, B.M., and Ingram, J.S.I. (2012). Climate change and food systems. Annual Review of Environment and Resources, 37(1), 195-222.

Wang, J., Zhang, L., and Li, H. (2021). Integrating traditional knowledge with modern agricultural techniques for enhancing productivity and sustainability in small-scale farming systems. Journal of Sustainable Agriculture, 15(3), 45-62.

Weingärtner, L. 2004. The concept of food and nutrition security. Food and nutrition assessment instruments and intervention strategies. Discussion paper 1. GTZ, Welt Hunger Hilfe, and Internationale Weiturbildung und Entwicklung GmbH.

WFP. 2008. Food consumption analysis calculation and use of the food consumption score in food security analysis. Version 1. World Food Programme, Vulnerability Analysis Monitoring Unit, Rome.

Wheeler, T. and Von Braun, J. 2013. Climate change impacts on global food security. Science, 341(6145):508-513.

Willey, R. W. (1979). Intercropping—its importance and research needs: Part 1. Competition and yield advantages. Field Crops Research, 2, 187-205.

World Bank. (2003). World Bank Rural Development Strategy: Increasing rural income and tackling poverty. World Bank Publications.

Zimstats. 2019. Zimbabwe Smallholder Agricultural Productivity Survey 2017 Report.

ZIMVAC. 2018. Rural livelihoods assessment report. Food and Nutrition Council and Zimbabwe vulnerability assessment committee, Harare.

ZIMVAC. 2019. Zimbabwe Vulnerability Assessment Committee. Rural Livelihoods

ZIMVAC. 2019. Zimbabwe Vulnerability Assessment Committee. Rural Livelihoods Assessment Report. Food and Nutrition Council, Harare.

APPENDICES

Appendix 1: BUSE Research clearance letter

My name is Richard Zhou, a Bindura University of Science Education fourth year student undertaking a Bachelor of Science Honors Degree in Development Studies. It is a prerequisite for final year students to undertake a research project and I am carrying out a research on "The contribution of small-scale crop production on household food security in Ward 9, Mberengwa rural, Zimbabwe". I am kindly appealing for your your assistance, contributions, and relevant information regarding this research. Information provided will be strictly kept confidential and private to pursue academic fulfillment. You are advised that upon participating in this survey there is no financial benefit. Your cooperation is greatly appreciated.

For further information regarding this study you can get in touch with me on

0775 565 389 / 0716 098 622 richardzhou246@gmail.com

Appendix 2: Questionnaire

Section A: Demographic data

1. Gender Male Femal

2. Age 20-30 31-49 50 - 69 70 above

3. Marital status Single Married Divorced Widowed

4. what is your highest level of education

Primar ZJC O-Level A-Level Tertiar

Section B: Food sources

5. How many different types of crops do you cultivate on your farm

1-2 3-5 5-8 8 above

6. How many of your household members are involved in small-scale crop production

1-5 6-9 10 above

7. How do households in Ward 9 market their surplus crop produce?

Sell at local markets Sell to traders Barter trade/trade with

Section C: Current status of small scale crop production

8. How many acres of land do you cultivate for crop production in Ward 9, Mberengwa rural

Cultural practice

Less than 3 4 to 7 7 to 10 11 above

9. Do you use any modern farming techniques in your crop production activities

yes No

10. Do you think there is enough food in your home to suit everyone's nutritional needs?

Yes, always Sometimes not No, never

11. How often do you experience food shortages in your household?

Rarely | Occasionall | Frequently

12. Have you noticed changes in weather patterns affecting your crop production?

Yes | No

13. What percentage of the household's total food consumption is sourced from small-scale crop production in Ward 9?

Less than | 25-50% | 50-75% | 75-

14. What are the main challenges faced by households in Ward 9 in ensuring food security through small-scale crop production?

Lack of access to inputs | Limited knowledge skills in crop | Unreliable weather patterns

15. How does the income generated from small-scale crop production contribute to household food security in Ward 9?

Provides additional food | Covers other household | Both of the above

16. How do households in Ward 9 ensure food preservation storage to mitigate food shortages during lean periods?

Drying | Storage in granaries

17. What are the major challenges faced by households in Ward 9 in expanding their small-scale crop production activities?

Limited access to irrigation | Pests and diseases affecting crops | Lack of access to credit for agricultural

18. Do you face challenges in accessing agricultural inputs for crop production

Yes | No

19. Are you satisfied with the current yield from your crop production activities

yes | No

20. Have you received any training on modern farming techniques in the past year

Yes

No

21. Do you sell any portion of your crop harvest for income generation

Yes

No

Section D: Strategies to improve food security

22. In your opinion, what measures can be taken to increase access to agricultural inputs for small-scale crop production in Ward 9, Mberengwa rural?

Providing subsidized seeds

Establishing community seed

Offering training on sustainable farming

23. How can the government or NGOs support small-scale farmers in Ward 9 to improve crop yields food security?

Providing access to agricultural

Offering financial support for irrigation systems

Facilitating market linkages for surplus

24. What strategies do you think would be effective in enhancing the resilience of small-scale farmers in Ward 9 to climate change?

Promoting drought resistant crop varieties

Implementing water harvesting

Supporting agroforestry

25. How can the community in Ward 9 work together to ensure food security for all households?

Establishing community gardens for collective crop

Sharing knowledge resources for sustainable farming

Organising food security awareness

26. What role can schools or educational institutions play in promoting food security in Ward 9?

Introducing agricultural education in the curriculum

Establishing school gardens for practical learning

Conducting nutrition food security workshops for students parents

27. How can technology be leveraged to improve small-scale crop production food security in Ward 9?

Providing access to weather forecasting tools	Using mobile apps for agricultural advice market information	Implementing precision agricultural techniques

28. How does the availability of water sources impact crop production food security in Ward 9?

Positively	Negatively

Appendix 3: Focus group discussion guide

1. Let's start by talking about the food we eat. What are the main ways that families in Ward 9 obtain the food they need?
2. Are there times of the year when it's harder for families to get enough food? What makes these times more difficult?
3. When you hear the term "food security," what does it mean to you? What are the key things that make a household food secure in Ward 9?
4. How important is growing your own food in ensuring food security for your family?
5. What are the biggest obstacles that small-scale farmers in Ward 9 face when trying to grow enough food?
6. Have things like changes in weather patterns, prices in the markets, or government policies affected how much food families can produce or access? How so?
7. If you could change one thing to make it easier for farmers to grow more food in Ward 9, what would it be? What other changes would help improve food security for everyone?
8. Who do you think should be involved in making these changes happen? What can different groups like the community, government, and organizations contribute?
9. Are there any new ideas or technologies that you think could help families in Ward 9 produce more food or access a wider variety of nutritious foods?
10. What are your hopes for the future of food security in Ward 9? What would a food secure future look like for families in this community?

Appendix 4: Interview guide

Project title: The contribution of small-scale crop production on household food security in Ward 9, Mberengwa rural, Zimbabwe

My name is Richard Zhou. I am a student currently studying Bachelor of Science Honours Degree in Development Studies at Bindura University of Science Education. This interview guide has been designed to collect information from representatives in the study area. You are requested to provide the following information to the best of your knowledge. The information will be treated with strict confidentiality.

Interview date…… (Interviews done after the consent by the respondents)

1. Can you describe the overall food system in Ward 9, including the main sources of food for households? How significant is small-scale crop production within this system?
2. From your perspective, what is the current status of household food security in Ward 9? Are there particular groups or periods of the year that are more vulnerable to food insecurity?
3. How would you characterize the current state of small-scale crop production in Ward 9? What are the key strengths and challenges faced by smallholder farmers?
4. In your view, what are the major external factors (e.g., climate change, market dynamics, government policies) influencing food security small-scale farming in Ward 9?
5. What support services resources are currently available to smallholder farmers in Ward 9? Are these services effectively meeting their needs?
6. What do you see as the primary gaps barriers preventing small-scale crop production from fully contributing to household food security in Ward 9?
7. What are the most promising opportunities to enhance the contribution of small-scale farming to food security in the ward? What specific interventions or strategies could be implemented?
8. How can different stakeholders (e.g., government agencies, NGOs, community organizations, private sector) contribute to strengthening food security through supporting small-scale agriculture in Ward 9?

9. Are there any innovative approaches or technologies (e.g., climate-smart agriculture, improved crop varieties, new market linkages) that could be particularly relevant for Ward 9? How could these be introduced supported?

10. What is your vision for a food-secure future in Ward 9? What needs to happen to make this vision a reality, particularly concerning the role of small-scale crop production?