

TITLE

Assessing how female-led nutrition gardens (Village Business Units) improve household food security. The case of Buhera District .

Bindura University of Science Education



**Faculty of Agriculture and Environmental Science
Department of Agricultural Economics, Education and Extension**

CHIPO TOKOTORE

B243724B

RELEASE FORM

Name of Candidate: Chipu Tokotore

Reg Number: B243724B

Degree: Master of Science Degree in Food Security and Sustainable Agriculture.

Project Title: Assessing how Female-led Nutrition Garden (Village Business Units) improve household food security: The Case of Buhera District

Permission is hereby granted to Bindura University of Science Education Library to produce a single copy of this dissertation and lend such copy for private, scholarly, or scientific research only.



Signed:

Permanent Address:

APPROVAL FORM

The undersigned certified that they have supervised and recommended to Bindura University of Science Education for acceptance of the dissertation entitled “**Assessing how Female-led Nutrition Garden (Village Business Units) improve household food security: the case of Buhera District.**” Submitted in partial fulfillment of a Master of Science Degree in Food Security and Sustainable Agriculture.

Name of supervisor: Ms Dadirayi Manyumwa

Signature: 

Date: 25 June 2026

Name of Departmental Chairperson: Dr Mafuse

Signature:

Date:

DECLARATION

I hereby declare that the research project entitled “**Assessing how Female-led Nutrition Garden (Village Business Units) improve household food security: the case of Buhera District.**” submitted to Bindura University of Science Education, Department of Agricultural Economics, Education and Extension is a record of an original work done by me under the guidance and supervision of Mrs Mary Manyumwa Kusinira. This work was submitted in partial fulfilment of the requirements for the award of a Master of Science Degree in Food Security and Sustainable Agriculture. The results embodied in this thesis have not been submitted to any University or Institute for the award of any degree or diploma.

Author: Chipu Tokotore

Reg Number: B243724B

Signature:



Date: 25 June 2026

DEDICATION

This research is dedicated to my family, friends, relatives, and all those who have dedicated their time and resources to the cause of development work.

ACKNOWLEDGEMENTS

This dissertation was made possible with guidance, support, and encouragement of many individuals, to whom I owe a great deal of gratitude.

Most importantly, I would like to express my sincere appreciation to my supervisor, for their priceless guidance, constructive feedback, and unwavering patience throughout this research journey. Their mentorship and expertise have been helpful in shaping both this work and my development as a researcher.

I would also like to thank the faculty and staff of the Department of Agricultural Economics, Education and Extension at Bindura University of Science Education for providing a stimulating academic environment and the resources necessary to conduct this research.

My gratitude extends to the participants who generously gave their time and insights, without whom this study would not have been possible.

Personally, I am grateful to my family and friends for their support and encouragement during what has been a challenging but rewarding process. Their belief in me never wavered, even when my own did.

Finally, I dedicate this work to my mother, whose inspiration continues to guide everything I do.

ABSTRACT

Household food insecurity is a recurring problem in semi-arid areas of Zimbabwe. As a result, governments and development partners have introduced nutrition gardens and Village Business Units (VBUs) as tools to improve food security, nutrition and livelihoods. Nevertheless, there is lack of empirical evidence regarding the extent of female-led nutrition gardens' impact on household food security in Buhera district. Therefore, this research was conducted to assess the role of female-led nutrition gardens to food security in Buhera District, Zimbabwe with particular focus on food availability, food accessibility, gender and sustainability. The sustainable livelihoods framework and the gender and development theory guided the study. Mixed-method cross-sectional research approach was used where both quantitative and qualitative data collection methods were combined. Data for quantitative analysis came from fifty-three households involved in nutrition gardens in four VBUs (Mutungagore, Evergreen, Usavi and Bangure). Data for qualitative analysis came from FGDs and KIIs done among members of nutrition gardens, AGRITEX staff, NGOs and community leaders. For quantitative data, descriptive and comparative analyses were done using Microsoft Excel software whereas for qualitative data thematic analysis was done. The study found that there were major contributions of the gardens towards household food security. Average daily meal frequency increased remarkably from 1.75 meals before involvement in the gardens to 3.45 meals after joining the garden ($p < 0.001$). Improved food availability and access was noted since all the households mentioned having increased availability of food in their homes while ninety-eight percent stated that the gardens helped in providing food throughout the year due to water for irrigation. The diets of all participating households became diverse because of consumption of different foods like legumes, fruits and vegetables. All the households earned money which was used to purchase food, settle school fees, medical bills and saving money. Women's ownership and control of the income received was however hindered by socio-cultural norms in the society and within the household. The study concludes that female-led nutrition gardens are an effective strategy for improving household food and nutrition security, income generation, and community resilience in Buhera District. However, strengthening women's decision-making power, improving market linkages, promoting savings groups, and enhancing local ownership are critical for ensuring long-term sustainability. The study recommends integrating gender-transformative approaches, financial inclusion mechanisms, and climate-resilient agricultural practices into future nutrition garden programming to maximise food security outcomes and reduce dependency on external support.

Keywords: Female-led nutrition gardens, food security, women's empowerment, sustainability, Village Business Units, Buhera District, Zimbabwe.

LIST OF TABLES AND FIGURES

Table 1 Comparison of daily meals frequency before and after joining the Nutrition garden	25
Table 2 Food accessibility indicators for Nutrition garden households (n=53)	28
Table 3 Nutrition garden household sustainability indicators	30
Table 4 Cross-VBU comparative Dashboard	32
Figure 1. Sex distribution of research participants	22
Figure 2 Age distribution of respondents	23
Figure 3 Percentage contribution by income sources to household income	24
Figure 4 Respondents reactions to food availability improvements	28
Figure 5 Factors affecting sustainability of Village Bussiness Units	Error! Bookmark not defined.

LIST OF ACRONYMS AND ABBREVIATIONS

AGRITEX	Department of Agriculture and Extension Services
CSI	Coping Strategy Index
GAD	Gender and Development
DFID	Department for International Development
FAO	Food and Agriculture Organisation
FGD	Focus Group Discussion
FNC	Food and Nutritional Council
HFIAS	Household Food Insecurity Access Scale
IFAD	International Fund for Agriculture Development
KII	Key Informant Interview
SACP	Smallholder Agriculture Cluster Project
SLF	Sustainable Livelihood Framework
UNICEF	United Nations Children`s Education Fund
VBU	Village Business Units
WFP	World Food Programme
WHO	World Health Organisation
ZIMSTAT	Zimbabwe National Statistics Agency
ZIMLAC	Zimbabwe Livelihoods Assessment Committee
ZINVAC	Zimbabwe Vulnerability Assessment Committee

TABLE OF CONTENTS

RELEASE FORM.....	1
APPROVAL FORM	2
DECLARATION	3
DEDICATION.....	4
ACKNOWLEDGEMENTS.....	5
ABSTRACT	6
LIST OF TABLES AND FIGURES	7
LIST OF ACRONYMS AND ABBREVIATIONS	8
CHAPTER 1	1
INTRODUCTION	1
1.1 Background of the Study	1
1.2 Statement of the Problem.....	3
1.3 Objectives of the Study	4
1.3.1 Main Objective.....	4
1.3.2 Specific Objectives.....	4
1.4 Research Questions	4
1.5 Hypotheses.....	5
1.6 Significance of the Study / Justification.....	5
1.7 Scope, Delimitations, and Limitations of the Study	5
CHAPTER 2	7
LITERATURE REVIEW.....	7
2.1 Food Security and Nutrition Gardens.....	7
2.2 Nutrition Gardens and Village Business Units in Zimbabwe.....	8
2.3 Nutrition Gardens and Gender Dynamics in Africa.....	9
2.4 Nutrition Gardens, Food Security and Its Pillars	10
2.5 Policy Context and Empirical Gaps in Zimbabwe	10
2.6 Theoretical Framework	11
CHAPTER 3	13
METHODOLOGY	13
3.1 Study Area.....	13
3.2 Research Design.....	14
3.3 Target Population	15
3.4 Sample Selection.....	15

3.5 Sample Size Determination	16
3.6 Data Collection Methods and Justification.....	16
3.6.1 Household questionnaire survey	16
3.6.2 Focus Group discussions.....	17
3.6.3 Key Informant Interviews	17
3.6.4 Methodological Triangulation.....	18
3.7 Analytical Framework	18
3.7.1 Food security status of Participating Households	19
3.7.2 Gender Roles, Resource Access, and Decision-Making	19
3.7.3 Contribution of Female-Led Nutrition Gardens to Household Food Security	20
3.7.4 Sustainability and Resilience of Female-Led Nutrition Gardens	20
3.7.5 Integration of Quantitative and Qualitative Findings	21
3.7.6 Coding of Data	22
3.8 Processing of Data	22
3.9 Validity and Reliability.....	23
3.10 Ethical Considerations.....	24
CHAPTER 4	25
FINDINGS	25
4.1 Food security status before joining nutrition gardens	25
4.1.1 Food Access	25
4.1.2 Food Utilization.....	26
4.3 Food Availability	26
4.2. Contribution of the nutrition gardens to the food availability of the household.	27
4.2.1. Number of meals per day: Pre and Post Joining VBU	27
4.2.2 All-year Garden production and diet diversification	29
4.3 Household Food Accessibility	29
4.4 Perceived Sustainability of the nutrition garden as a food security tool	32
Chapter 5	35
Discussion	35
5.1 Food security situation.....	35
5.1.1 The Female Majority and Gendered Agricultural Labor	35
5.1.2 Education, Income, and Structural Vulnerability	36
5.2 Food Availability: Interpreting the Meal Frequency Gains.....	36
5.2.1 Magnitude and Significance of the Meal Frequency Increase	36
5.3 Food Accessibility.....	37
5.3.1 Gardens as Dual Instruments of Food and Income Access	37
5.3.2 The Labour-Income Control Paradox.....	38

5.4 Sustainability: Enablers, Barriers, and the Transition from Aid Dependency	39
5.4.1 Water Security and Climate Resilience	39
5.4.2 Financial Sustainability	39
5.4.3 Donor Independence.....	40
5.5 Theoretical Implications.....	41
5.6 Implications for Policy and Programs.....	41
5.7 Limitations of the Study	42
Conclusion	44
REFERENCES.....	46
APPENDICES.....	Error! Bookmark not defined.
QUESTIONNAIRE.....	51
FOCUS GROUP DISCUSSION	54
KEY INFORMANT INTERVIEWS	55

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Food insecurity remains a pressing challenge in Africa and worldwide. In 2023, approximately 733 million people faced hunger, with sub-Saharan Africa bearing the greatest burden (FAO, IFAD, UNICEF, WFP, & WHO, 2023). Women and children are disproportionately affected by this issue. Furthermore, over 2.3 billion people worldwide have experienced moderate to severe food insecurity, characterised by uncertainty in accessing food regularly (FAO et al., 2024). Climate change, poverty, and weak food systems continue to undermine food availability and access.

To curb food insecurity, community nutrition gardens were introduced globally to improve household food and nutrition security. Nutrition gardens contribute to all four pillars of food security. They improve availability by increasing local food production, especially vegetables. They enhance access through income earned from selling surplus produce. They support utilization by improving dietary diversity and nutritional quality. Irrigated gardens also improve stability by enabling year-round production, despite climate shocks (FAO, 2015; Murendo et al., 2018). These gardens increase access to vegetables and improve dietary diversity and household income. Evidence from Kenya, Malawi, and Zambia shows that households with nutrition gardens consume more vegetables and achieve better dietary diversity than non-participating households (World Bank, 2021; Murendo et al., 2018). However, these benefits are not equally distributed between men and women.

Women are often the primary participants in nutrition gardens due to their traditional roles in food preparation and child nutrition. Studies from India and Bangladesh have demonstrated that women-managed gardens improve household diet quality and child micronutrient intake, with some reporting up to a 30% increase in vegetable consumption (FAO, 2015; Ruel et al., 2018).

Yet, many global studies emphasise participation and nutrition outcomes without adequately examining control over production, income, or resources. Gender is frequently conceptualised as women's involvement rather than shared management between men and women, leaving a gap in understanding how gender relations shape long-term sustainability and food security outcomes. However, studies also show that benefits are not equal between men and women.

Gender dynamics are central to the concept of nutritional gardens. Women typically provide most of the labour and manage household nutrition, while men often control land, irrigation equipment, finances, and marketing decisions (FAO, 2020). Women may contribute more labour but reap fewer benefits. Existing studies rarely analyse the outcomes of joint management between men and women, resulting in a gap in knowledge about how gender relations influence food security.

In Zimbabwe, food insecurity is high, especially in semi-arid areas. According to the Zimbabwe Livelihoods Assessment Committee (ZIMLAC), about 49% of rural households were food insecure, with the highest vulnerability recorded in Agro-ecological Regions IV and V (ZIMSTAT, 2022; ZIMLAC, 2023). Buhera District falls in Region V, which receives less than 650 mm of rainfall per year. Rainfall is erratic, and droughts are frequent in the region. Climate change has worsened this situation, with temperatures often exceeding 38°C.

To mitigate these challenges, the Government of Zimbabwe and development partners introduced nutrition gardens, which were later upgraded into Village Business Units (VBUs). VBUs are community-managed gardens equipped with irrigation, fencing, and market linkages designed to transition from subsistence gardening to small-scale business enterprises. By 2025, more than 1,100 VBUs had been established nationwide, supported by thousands of boreholes for irrigation. In the Buhera District alone, 52 VBUs have been established through government and Non-Governmental Organisation (NGO) collaboration. VBUs are reported to enhance food availability, income, and resilience, particularly among women and youth (IFAD, 2025).

ZIMLAC reports indicate that communities with functioning nutrition gardens and irrigation schemes show improved food availability, increased vegetable consumption, and reduced

dependence on food aid, particularly during lean seasons (ZIMLAC, 2023). Despite the expansion of nutrition gardens and VBUs, most existing studies and reports focus on production outputs and income generation, with limited attention to how gender dynamics influence household food security outcomes. In particular, there is a lack of evidence on how female-led nutrition gardens contribute to the four pillars of food security in semi-arid districts such as Buhera.

Therefore, this study seeks to examine the role of female-led nutrition gardens in improving household food security, while also analysing the challenges and gender-related constraints that affect their effectiveness. By focusing on Buhera District, the study aims to provide context-specific insights that can inform interventions aimed at strengthening nutrition gardens as sustainable and inclusive food security strategies.

1.2 Statement of the Problem

Despite increased investment in Nutrition Gardens and Village Business Units (VBUs), many rural households in Zimbabwe remain food insecure.

In response to these challenges, nutrition gardens have been widely promoted as a strategy for improving household food security and nutrition. In many rural communities, these gardens are female-led, with women playing a central role in food production, preparation, and household nutrition management (FAO, 2015; World Bank, 2021). Existing studies show that female-led nutrition gardens contribute to improved dietary diversity, increased vegetable consumption and enhanced household food availability (FAO, 2013; Ruel *et al.*, 2018). Women's involvement in these gardens has also been associated with improved child nutrition and better allocation of resources towards food, health, and education (FAO, 2020).

However, despite these positive contributions, there are important gaps in the existing literature. Most studies focus on the benefits and participation of women in nutrition gardens, with limited attention to the challenges and constraints they face in managing these gardens. Issues such as limited access to land, water, credit, and agricultural inputs, as well as heavy labour burdens and

climate variability, are often not analysed (Gukurume, 2019; Mapfumo & Dube, 2022). Furthermore, there is insufficient evidence on the sustainability of female-led gardens and how these constraints affect their long-term contributions to household food security.

In addition, while female-led gardens are widely promoted, there is limited understanding of how effectively they contribute to food security. Therefore, this study seeks to examine the contribution of female-led nutrition gardens to household food security, while also analysing the key challenges and limitations that affect their effectiveness. By focusing on Buhera District, the study aims to generate context-specific evidence that can inform policies and interventions aimed at strengthening nutrition gardens as sustainable food security strategies.

1.3 Objectives of the Study

1.3.1 Main Objective

To analyse the relationship between female-led nutrition gardens and food security of participating households.

1.3.2 Specific Objectives

- a) To understand the food security status of households prior to joining female-led nutrition garden projects.
- b) To examine the contribution of female-led nutrition gardens to household food availability and accessibility.
- c) To analyse the perceived sustainability of female-led nutrition gardens as a means to improve household food security.

1.4 Research Questions

- a) What was the food security status of households prior to joining female-led nutrition gardens in Buhera District?
- b) How do female-led nutrition gardens contribute to household food availability and accessibility in Buhera District?

- c) How sustainable are female-led nutrition gardens as a strategy for improving household food security in Buhera District?

1.5 Hypotheses

Village Business Units (VBUs) with higher levels of meaningful female participation and gender-inclusive governance yield better household food security outcomes than VBUs without these features.

1.6 Significance of the Study / Justification

This study will provide evidence of how female-led nutrition gardens influence food availability, access, and dietary diversity through nutrition gardens. The findings will help Zimbabwean scholars and development practitioners understand gender dynamics in nutrition gardens and offer lessons for similar semi-arid areas.

Practically, the research will guide government agencies and ministries, NGOs, and development partners to design gender-sensitive programs, strengthen market linkages, and provide better institutional support to VBUs. Combining surveys and interviews will allow this study to identify actionable steps to improve household food security. The evidence generated can inform national and local policies on agricultural development, nutrition programs, and gender inclusion, helping to ensure that interventions are equitable, effective, and sustainable.

1.7 Scope, Delimitations, and Limitations of the Study

This study will focus on Buhera District in Manicaland Province, specifically targeting households and community members engaged in nutrition gardens (VBUs.) This study focuses on gender participation and its influence on food security at the household level.

Delimitations: This research will not cover all livelihood initiatives but will be limited to nutrition gardens (VBU). This study will focus on adult men and women, excluding children and youth, as primary participants.

Limitations: Potential limitations include time and financial constraints, possible reluctance of participants to share information on gender-related issues, and limited generalizability of findings to other districts with different socioeconomic contexts.

CHAPTER 2

LITERATURE REVIEW

2.1 Food Security and Nutrition Gardens

Food insecurity is a major global challenge. According to the Food and Agriculture Organization (FAO, 2023), approximately 735 million people worldwide experienced hunger in 2022, with Sub-Saharan Africa having the highest levels of undernourishment. Women and children are the most affected because of poverty, gender inequality, and limited access to productive resources. Nutrition-sensitive agricultural interventions, such as home and community gardens, are widely promoted as sustainable ways to improve household food security (FAO, 2013).

Nutrition gardens contribute significantly to household food availability and dietary quality. Studies from Asia, Latin America, and sub-Saharan Africa have demonstrated that households participating in home or community gardens have higher dietary diversity scores and improved access to fresh vegetables than non-participating households (FAO, 2015; World Bank, 2021). FAO (2015) reports that, in low-income settings, home and community gardens can contribute up to 60 % of household vegetable consumption, reducing reliance on purchased foods and enhancing micronutrient intake.

In Vietnam, a nutrition garden programme supported by FAO increased household food availability by 82% and reduced child malnutrition by 12.8% within two years (FAO, 2013). Studies in South Africa also show that households practising gardening are approximately 50% more food secure than non-gardening households (Musotsi, Mugambiwa and Ngcobo, 2020). These findings indicate that small-scale gardens play an important role in improving food access and nutrition outcomes globally.

Evidence from Bangladesh, Nepal, and Cambodia shows that nutrition gardens improve vitamin A, iron, and zinc intake, particularly among women and children, leading to better nutritional outcomes (Ruel et al., 2018). These findings highlight the importance of gardens in strengthening

the availability and utilization pillars of food security. However, global literature tends to emphasise nutritional outcomes rather than the governance and management structures underpinning garden productivity and income use.

2.2 Nutrition Gardens and Village Business Units in Zimbabwe

In Zimbabwe, food insecurity remains a concern due to drought, economic challenges, and climate change. The Zimbabwe Vulnerability Assessment Committee (ZimVAC, 2023) reported that approximately 3.8 million rural people were projected to be food insecure during the 2023 lean season. Poor rainfall patterns and high food prices continue to affect rural households, including those in districts such as Buhera. To address these challenges, the government and development partners have promoted nutrition gardens and Village Business Units (VBUs) to improve household food security.

Nutrition gardens in Zimbabwe began as small-scale community or household gardens focused on producing leafy vegetables, legumes, and other nutrient-rich foods to improve diets, especially among vulnerable rural families. Initially, these gardens were promoted by civil society organisations, development partners, and government extension services as part of nutrition-sensitive agricultural programmes to combat persistent malnutrition and chronic food shortages in rural areas (FAO, 2013). Over time, the concept evolved from home gardens to larger, more structured community and business models, particularly with the introduction of Village Business Units (VBUs) under national development strategies.

The VBU programme was formally launched in 2021 by the Government of Zimbabwe under the Presidential Rural Development Programme to transform rural agriculture from subsistence to commercial and climate-resilient production (Zimbabwe National Water Authority, 2023). By October 2023, 11 School Business Units and 78 Village Business Units had been established nationwide as part of the government's efforts to improve rural livelihoods. VBUs consist of one-hectare irrigated plots equipped with solar-powered boreholes, fishponds, greenhouses, and sometimes livestock facilities run as community-owned businesses (FNC report, 2025).

Women are central to both the nutrition gardens and the VBU model. In many VBUs, women constitute a large share of beneficiaries, helping with the cultivation, marketing, and management of garden produce (DevelopZim, 2025). For example, the Baza VBU in Ndali, Chiredzi has 46 women and only four men among its core beneficiaries, growing vegetables that generate substantial income for households (DevelopZim, 2025). In Hwange and Lupane districts, VBUs established under the Smallholder Agriculture Cluster Project (SACP) have empowered women to grow crops that improve diets and strengthen incomes (SACP report, 2025).

According to World Vision Zimbabwe (2021), community nutrition gardens managed mainly by women improved vegetable consumption and income for over 700 households in rural Zimbabwe. Women involved in these projects reported improved confidence, decision-making power, and financial independence levels. VBUs have increasingly been framed not only as subsistence food sources but also as community-based agribusiness models aimed at strengthening resilience, market participation, and rural development in line with national development priorities (Government of Zimbabwe, 2020, 2021).

2.3 Nutrition Gardens and Gender Dynamics in Africa

Gender studies in Africa show that women provide most of the labour in gardens, often 60–70 % of production work (Njaya, 2019; World Bank, 2021). However, men often control land, irrigation infrastructure, and decisions regarding the sale of produce. In Malawi and Zambia, when men dominate marketing decisions, income is less likely to be spent on household food, reducing potential nutritional benefits (FAO, 2020). However, when women have greater control over income and decision-making, expenditures on food, healthcare, and education tend to increase.

While these studies highlight gender inequalities, they largely focus on individual roles and access to resources rather than on joint decision-making processes within households. There is limited evidence on how cooperation or negotiation between men and women in managing

garden activities influences food-security outcomes. This suggests the need to analyse the extend in which the female-led nutritional gardens contribute to food security and sustainability.

2.4 Nutrition Gardens, Food Security and Its Pillars

Food security exists when all people, at all times, have social, physical, and economic access to safe, sufficient and nutritious food that meets their dietary needs for a healthy and active life (FAO, 2015). Food security is built on four interrelated pillars: availability, access, utilization, and stability.

Food availability refers to the presence of physical food through production, distribution, and food exchange. Food access concerns the ability of households to acquire food through purchase and self-production. Food utilization relates to the proper biological use of food, including dietary diversity and nutritional quality. Stability refers to the consistency of food access over time, especially during shocks, such as droughts or economic crises (FAO, 2015).

In sub-Saharan Africa, food insecurity is often driven by low agricultural productivity, climate variability, poverty, and limited access to productive resources (FAO et al., 2023). In semi-arid areas such as Buhera District, unstable rainfall patterns reduce food availability and increase vulnerability to hunger (Matsa & Muringayi, 2020). Therefore, agricultural interventions, such as nutrition gardens, are promoted as strategies to simultaneously strengthen all four pillars.

2.5 Policy Context and Empirical Gaps in Zimbabwe

ZIMSTAT (2022) reports that nearly half of rural households remain food insecure, with higher vulnerability in Agro-Ecological Regions IV and V, including Buhera District. Women dominate daily garden activities, such as planting, watering, weeding, and harvesting (Gukurume, 2019; Mapfumo & Dube, 2022). However, men usually control land ownership, irrigation access, and income from produce sales. The National Development Strategy 1 (NDS1) emphasises food and nutrition security, women's empowerment, and climate-resilient agriculture as pillars of national development (Government of Zimbabwe, 2020). The NDS2 builds on this by promoting

inclusive growth, agribusiness development, and gender mainstreaming, aligning closely with the VBU model (Government of Zimbabwe, 2021).

While several studies highlight the positive contributions of female-led gardens, they tend to focus mainly on participation and outcomes, such as increased food production and improved dietary diversity. However, limited attention has been given to the constraints and challenges women face in managing these gardens.

These challenges include limited access to land and water, lack of financial resources, inadequate extension support, climate variability, and heavy labour burdens. In addition, the issue of control over income remains unclear in many cases, as women may not have full decision-making power over the use of proceeds from garden produce.

Furthermore, there is limited empirical evidence on the sustainability and scalability of female-led gardens as long-term food security interventions, particularly in semi-arid districts such as Buhera, Zimbabwe. Most studies do not comprehensively analyse how these constraints interact with the four pillars of food security.

Therefore, this study seeks to fill this gap by examining how female-led nutrition gardens contribute to household food security, while also analysing the limitations and challenges that affect their effectiveness in Buhera District.

2.6 Theoretical Framework

This study is guided by the Sustainable Livelihoods Framework (SLF) and supported by Gender and Development (GAD) theory. The Sustainable Livelihoods Framework explains how households use different livelihood assets, including human, social, natural, physical, and financial capital, to improve their food security (DFID, 1999). In Nutrition Gardens (Village Business Units), men and women contribute differently to these assets through labour, skills, access to land and water, decision-making, and control of income. The framework also

recognizes the influence of policies, institutions, and social norms in shaping how Nutrition Gardens function and their contribution to household food security.

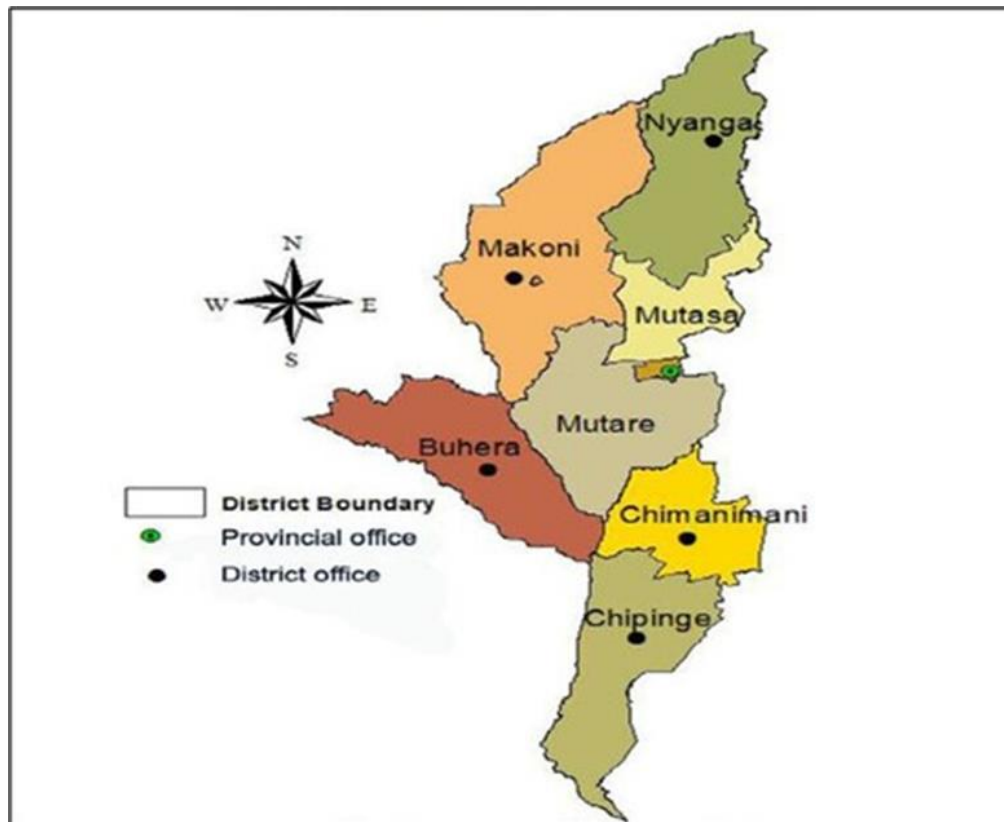
Gender and Development theory complements the SLF by focusing on social relations and power dynamics between men and women (Rathgeber, 1990). This helps explain how gender roles, decision-making authority, and control over resources affect participation in Nutrition Gardens and the distribution of benefits. The conceptual framework therefore assumes that gender-responsive management of Nutrition Gardens influences food availability, access, utilisation, and stability at the household level. When both men and women participate fairly in managing and benefiting from Nutrition Gardens, household food security outcomes are expected to improve.

CHAPTER 3

METHODOLOGY

3.1 Study Area

Buhera District is located in eastern Zimbabwe in Manicaland Province. It is located approximately 170 km southwest of Mutare and southeast of Harare. The district is bordered by Makoni and Mutare to the east, Wedza and Chikomba to the north, and Gutu in Masvingo Province to the south and west. Buhera is situated at approximately 19°19' south latitude and 31°26' east longitude, with an average altitude of about 1,100–1,200 m above sea level (Zimbabwe National Statistics Agency (ZIMSTAT), 2022; Food and Nutrition Council (FNC), 2023). The terrain is generally flat to gently undulating, with some isolated hills and river valleys.



Buhera falls within Zimbabwe's Agro-ecological Regions III, IV and V, which are characterised by low and erratic rainfall. The district receives an average annual rainfall ranging between 400 mm and 800 mm; rainfall is often poorly distributed and unreliable (FNC, 2023). Droughts are common and have become more frequent due to climate change, making crop production risky and contributing to recurring food insecurity. Temperatures are generally high during summer, often exceeding 34°C, while winters are relatively cool, especially at night (Meteorological Services Department, 2022).

The natural vegetation in Buhera is mainly dry savanna woodland and grassland. The soils in Buhera are sandy loam, which are generally low in fertility and have limited water-holding capacity (FNC, 2023). In some areas, soils are shallow and prone to erosion, especially where vegetation cover has been removed. As a result, agricultural productivity is often low unless soil fertility management practices, such as manure application, fertilizer use and conservation agriculture, are adopted.

The district has received support from government and NGOs in promoting community gardens and VBUs. These initiatives are expected to mitigate food insecurity, promote income diversification, and enhance resilience. However, gender norms and inequalities continue to influence participation and outcomes in these interventions.

3.2 Research Design

This study adopted a mixed-methods cross-sectional design, integrating both quantitative and qualitative approaches. The cross-sectional survey collected quantitative data on household characteristics, participation in female-led nutrition gardens, and food security status at a single point in time. This design was appropriate because it allows for the analysis of relationships between variables across a defined population without requiring long-term follow-up (Kothari, 2004).

Qualitative methods, including FGDs and KIIs, will provide in-depth insights into gender roles, intra-household decision-making, and community perceptions regarding nutrition gardens and

VBUs. These methods are particularly useful in capturing lived experiences and social dynamics that cannot be fully explained through quantitative data alone.

The use of mixed methods is justified by the need for complementarity and triangulation, where quantitative data provide measurable trends while qualitative data explain underlying processes and meanings (Creswell & Plano Clark, 2018). This approach is suitable for examining both the measurable contributions and contextual challenges of female-led nutrition gardens to household food security.

3.3 Target Population

The target population comprised households participating in female-led nutrition gardens and VBUs in Buhera District. These households are actively engaged in food production and income-generating activities supported by government and non-governmental organisations.

Both female-headed and male-headed households were included to allow for comparative gender analysis, with particular emphasis on households where women play a leading role in garden management.

Key stakeholders, including AGRITEX extension officers, NGO personnel, and community leaders, were included in the qualitative component to provide expert insights into programme implementation, gender dynamics, and sustainability (Kothari, 2004).

3.4 Sample Selection

The study employed stratified random sampling methods to ensure representation across different groups. Wards will be stratified based on the presence of nutrition gardens and VBUs, focusing on Wards 19, 21, and 22 in Buhera District.

A sampling frame of participating households was obtained from AGRITEX, Buhera Rural District Council, and local NGOs. Households were randomly selected within each ward to minimise bias.

Stratification also considered gender to ensure inclusion of female-led households. This approach improved representativeness and allowed for meaningful comparisons in analysing food security outcomes (Bryman, 2016).

3.5 Sample Size Determination

A total of 53 households were selected for the quantitative survey. This sample size is appropriate for a small-scale academic study, allowing for manageable data collection while still generating meaningful and reliable insights (Kothari, 2004).

Additionally, smaller samples are acceptable in mixed-methods studies where qualitative data complements quantitative findings (Creswell & Plano Clark, 2018).

Six FGDs (three female and three male groups) and at least 10 KIIs were conducted to enrich and validate survey results through triangulation.

3.6 Data Collection Methods and Justification

This research used several data collection methods for the purpose of obtaining reliable and in-depth evidence on the effect of nutrition gardens led by women in the household food security context. Both quantitative and qualitative methods were adopted in order to triangulate the methods, ensuring validity, credibility, and depth of data (Creswell & Plano Clark, 2018).

3.6.1 Household questionnaire survey

The researcher administered a household questionnaire to gather quantitative data from the female respondents on their socio-economic characteristics, their level of involvement in the

activities of the nutrition gardens, agricultural production outcomes, and household food security. Such questionnaire was utilised to collect standardised data that could be compared across respondents' households and to analyse statistically the association between the women's participation in nutrition gardens and food security in the household context.

Food security at the household level was measured using standard international indicators. The household's experiences with food access constraints and with food insecurity was measured by adapting the Household Food Insecurity Access Scale (HFIAS) (Coates et al., 2007). The Household Dietary Diversity Score (HDDS) was used as a proxy indicator of food access and food security since it reflects the quality and diversity of the household's diet. Moreover, the Months of Adequate Household Food Provisioning (MAHFP) indicator was used to describe the level of adequacy and the ability of households to access sufficient food throughout the year. Conjoint use of these indicators informs about multidimensional aspects of food security. The Food security of the community was examined through

3.6.2 Focus Group discussions.

Focus group discussions with nutrition garden participants to the programme were used to gain a more in-depth understanding of their experience. The issues discussed were not entirely captured by quantitative methods. The focus groups focused on the gendered aspects of nutrition garden implementation and impact. For example, labour allocation and decision making were discussed, as were barriers and incentives for women in the programme. The use of FGDs was considered appropriate, since the method allows participants to interact with one another and discuss their common experience, which is especially useful to (re)construct knowledge on social norms or community life, as well as issues such as gender roles and stratification (Krueger & Casey, 2015). The use of FGDs allowed for collection of contextual information that supplements the results of the household survey.

3.6.3 Key Informant Interviews

Key informant interviews were conducted with selected stakeholders (i.e. AGRITEX, all NGOs and the NGO project managers, local community leaders, government and local authorities, and the circulation of the nutrition garden committee members) to gain a deeper understanding of the

experience on the nutrition garden programme. The interviewees were purposively selected based on their knowledge on the implementation of the nutrition garden programme. The KIIs provided detailed insights on the programme implementation, institutional support and programme extension activities. The KIIs also focused on gender, policy and sustainability issues concerning the nutrition garden programme. The KIIs contributed to better understanding and explanation of the patterns that emerged from the household survey and focus group discussions. The study used a secondary data review to collect contextual information for the study. Documents used in the review were government representative policy documents, reports from the field of agriculture and food security, programme reports from NGOs, project monitoring and evaluation reports and previous research articles. The review was useful in contextualizing food security issues and interventions such as nutrition gardens in the study area. Additionally, the review was a method of validation, whereby information obtained in the primary data could be corroborated and even challenging.

3.6.4 Methodological Triangulation

The use of household surveys, key informant interviews and focus group discussions along with the document review enabled methodological triangulation. Triangulation helped the researcher to corroborate information obtained from one source with that of another source, improving reliability, validity and comprehensiveness. Additionally, it was also useful in observing how the quantitative outcomes align with the qualitative processes within which female nutrition gardens are effective.

3.7 Analytical Framework

This study seeks to understand how female-led nutrition gardens contribute to household food security in Buhera District. The analysis is guided by the study objectives and adopts a mixed-methods approach, combining qualitative and quantitative data to provide a comprehensive understanding of participants' experiences and outcomes. The framework is based on the understanding that food security extends beyond food production to include access to food, the proper utilisation of available food resources, and the ability of households to sustain food security over time.

3.7.1 Food security status of Participating Households

The first stage of analysis focuses on understanding the food security status of households participating in female-led nutrition gardens. Variables such as food access, availability and utilisation, stability were analysed using descriptive statistics, including frequencies, percentages, means, and standard deviations. This provides a clear picture of food security status before participation in nutrition gardening.

In addition, vegetable production levels, sources and adequacy of irrigation water and land ownership were analysed quantitatively while qualitative responses relating to participants' reasons for joining nutrition gardens are analyzed thematically to identify common motivations. These may include the need to improve household food supplies, generate income, enhance family nutrition, or cope with economic hardships. The analysis also examines indicators of women's empowerment, such as control over garden income, ownership of productive assets, and participation in household decision-making, to better understand the role of nutrition gardens in strengthening women's socio-economic position.

3.7.2 Gender Roles, Resource Access, and Decision-Making

Since the study focuses on female-led nutrition gardens, it is important to understand how responsibilities and resources are distributed within households and garden projects. This section examines who performs various gardening activities, including land preparation, planting, watering, weeding, harvesting, and marketing produce. It also assesses who has access to key resources such as land, water, farming inputs, and gardening tools.

The analysis further explores household decision-making processes, particularly regarding crop selection, the use of garden produce, the management of income generated from sales, and investment decisions. Cross-tabulations and comparative analyses are used to identify patterns and relationships between resource access and household food security outcomes.

Qualitative data from focus group discussions and key informant interviews are used to gain deeper insights into gender relations, the challenges faced by women in accessing productive

resources, and the extent to which nutrition gardens contribute to women's empowerment and influence within the household.

3.7.3 Contribution of Female-Led Nutrition Gardens to Household Food Security

The third stage of analysis examines the extent to which female-led nutrition gardens contribute to household food security. The analysis is organized around the key dimensions of food security, namely food availability, food accessibility, food utilization, and food stability.

Food availability is assessed by examining crop diversity, production levels, frequency of harvests, and the number of months during which households rely on produce from the gardens. Participants' perceptions of changes in food availability since joining the gardens are also explored.

Food accessibility focuses on the ability of households to obtain sufficient food. This includes examining the proportion of produce consumed at home versus sold, income generated from garden activities, and how that income is used. Particular attention is given to whether garden income enables households to purchase additional food and meet other essential household needs.

Food utilization considers how garden produce contributes to household nutrition. Indicators such as dietary diversity, frequency of vegetable consumption, and perceived improvements in family nutrition are analyzed to determine whether nutrition gardens are improving the quality of household diets.

Food stability is examined by assessing the consistency of food availability and access throughout the year, particularly during periods of drought, economic hardship, or other shocks. This helps determine whether nutrition gardens provide a reliable source of food over time.

3.7.4 Sustainability and Resilience of Female-Led Nutrition Gardens

The fourth component of the analysis focuses on the sustainability of female-led nutrition gardens as a long-term strategy for improving household food security. The analysis examines

environmental, social, institutional, and financial factors that influence the continued success of the gardens.

Environmental sustainability is assessed through the adoption of climate-smart agricultural practices such as mulching, composting, water conservation, crop rotation, and the use of organic fertilizers. Institutional sustainability is explored by examining participants' access to agricultural extension services, training opportunities, and support from government departments and development organizations.

Financial sustainability is assessed through indicators such as income generation, savings practices, participation in savings groups, and the ability of households to reinvest resources into garden activities. Social sustainability is examined through community participation, knowledge sharing, cooperation among members, and local ownership of garden initiatives.

To provide a broader understanding of resilience, participants' views on whether the gardens can continue operating without external assistance are analyzed thematically. This helps identify strengths, opportunities, and challenges that may affect the long-term viability of nutrition gardens in the district.

3.7.5 Integration of Quantitative and Qualitative Findings

The final stage of analysis brings together findings from both quantitative and qualitative data sources. Survey data provide measurable evidence of the contribution of female-led nutrition gardens to household food security, while focus group discussions and key informant interviews provide context and deeper explanations for the observed outcomes.

By triangulating findings from different sources, the study develops a more complete understanding of how female-led nutrition gardens influence food security, women's empowerment, and household resilience. This integrated approach strengthens the validity of the findings and allows for a nuanced assessment of the role of nutrition gardens in improving the livelihoods of participating households in Buhera District.

3.7.6 Coding of Data

Quantitative data were coded numerically and entered into Excel for analysis. Each variable was assigned a code to ensure consistency and facilitate statistical analysis (Kothari, 2004).

Qualitative data from FGDs and KIIs were transcribed and analysed using thematic coding, where recurring themes related to gender participation, food security, and constraints were identified and categorised (Braun & Clarke, 2006).

3.8 Processing of Data

Data analysis was carried out with the help of descriptive statistics using Microsoft Excel. To assess the level of community participation in nutrition garden implementation and to examine the changes in household food diversity and food security status. The Household Dietary Diversity Score (HDDS) and the Household Food Insecurity Access Scale (HFIAS) were used to assess household food diversity and food security status respectively. The data was coded and entered into the computer with the help of a data coding sheet. The data was edited and analysed through the use of comparative and descriptive statistical methods. Using descriptive statistics, frequencies, percentages and tables were generated for variables like household dietary diversity scores of the respondents, food security, and participation of women in nutrition garden activities were prepared. This method of summarising and analysing household data further assisted the researcher in establishing a conclusion for the study.

Focus group discussions (FGDs) and key informant interviews (KIIs) were conducted with women nutrition-garden participants and nonparticipants, respectively. For the qualitative data, a thematic analysis was undertaken. Quantitative and qualitative data were analysed separately and then triangulated during the interpretation of results. The study adopted a convergent mixed-methods approach in which quantitative and qualitative findings were analysed separately and subsequently integrated during interpretation. The integration of data from multiple sources facilitated triangulation and enabled a more comprehensive understanding of the research problem. Quantitative findings provided measurable evidence of trends and relationships, while qualitative findings offered contextual explanations and deeper insights into the observed

outcomes. This complementary approach enhanced the validity and richness of the study findings (Creswell & Plano Clark, 2018). Qualitative data generated through Focus Group Discussions (FGDs), Key Informant Interviews (KIIs), and document reviews were transcribed verbatim and organised for analysis. Thematic analysis was employed to examine the qualitative data, following a systematic process of familiarisation with the data, coding, categorisation, and theme development. Emerging themes and sub-themes were identified based on recurring patterns, perceptions, experiences, and viewpoints expressed by participants. This approach enabled an in-depth understanding of the contextual factors influencing women's participation in nutrition gardens and their contribution to household food security.

3.9 Validity and Reliability

This study employed the use of various tested and standardised methods to enhance the validity and reliability of the study. The content and construct validity of the study were achieved through the utilisation of standardised and internationally accepted instruments for the measurement of food security; Household Dietary Diversity Score (HDDS) and Household Food Insecurity Access Scale (HFIAS), both of which are widely used and have been tested and validated in a number of studies on the topic (Coates et al., 2007). The use of these tools facilitated the accurate measurement of the dimensions of household food security. Furthermore, the questionnaire was pre-tested for validity in a community that was similar to the study area to identify and modify ambiguous, non-consistent and poorly structured questions before value data collection. The pre-test feedback informed the research instrument re-naming to improve its reliability.

In this study, several data collection methods such as household surveys, focus group discussion (FGDs) and Key informant interviews (KIIs) and document review were used. This use of multiple methods of data collection in support of each other was known as the methodological triangulation approach which assisted in cross-checking of results as well as provided a broader and richer understanding of the issue under investigation. It improves the credibility and trustworthiness of the study outcomes by ensuring not to depend on only one data source or a single method (Bryman, 2016). Standardised procedures were adhered to across respondents to

assure reliability. Structured questionnaire with explicit or detailed questions and response options, for example, avoided the risk of misinterpretation. Oversight of data collection procedures was maintained by writing field notes, recording the interviews and discussions verbatim which provided an audit trail. These measures facilitated correlating the findings from different sources with each other. The goal was to overcome the challenge that commonly arises with research methods which is ensuring the dependability of the results.

Additionally, internal consistency was preserved through consistent administration of the research measures to every individual in the target population. All data were evaluated, coded, and cleaned in detail before they were subject to analysis in order to minimise mistakes and increase the accuracy and uniformity of the dataset. In sum, these methods improved the overall validity, reliability and sturdiness of the results.

3.10 Ethical Considerations

This research was conducted on the basis of ethical guidelines for social science research. Informed consent to participate in the study was secured from the individuals after clearance about the purpose of the research, the research procedures, the benefits of the study, as well as clear information about the rights they had as respondents. Participation was entirely voluntary and respondents were advised of their rights to withdraw from the study at any stage without any negative repercussions.

To protect the respondents' privacy and uphold confidentiality, information collected was anonymised and personal information was removed. Information secured from respondents was kept confidential and was used only for academic purposes. Information was securely stored and only the researcher had access to the data.

In addition, permission for carrying out the study was secured among relevant authorities, namely the Buhera Rural District Council, and local community leadership structures. Ensuring compliance with these ethical considerations was necessary for the protection of respondents' rights, for ensuring that a good relationship between the researcher and respondents was established, for ensuring that the findings of the study were credible, and for ensuring the integrity of the research (Kothari, 2004).

CHAPTER 4

FINDINGS

This chapter presents the results derived from a mixed-methods approach, examining the outcomes of a structured household survey (n = 53) among the four Village Business Units (VBUs) (i.e., Mutungagore, Evergreen, Usavi and Bangure) of Buhera District and a series of focus group discussions (FGDs) and key informant interviews (KIIs). The KIIs included women from the nutrition gardens, AGRITEX officers and NGO staff. Findings have been grouped under four major sections, i.e., (1) Food security status of the households; (2) Household food availability; (3) Household food accessibility; and (4) Perceived sustainability of the nutrition gardens as a provider of food security.

4.1 Food security status before joining nutrition gardens

4.1.1 Food Access

Prior to joining the community nutrition garden programme, the majority of the 53 participating households reported severely constrained economic access to food. Assessment using the Household Food Insecurity Access Scale (HFIAS) revealed that 73.6% of households (n = 39) were classified as food insecure, with 45.3% (n = 24) falling within the severely food-insecure category. The primary driver of limited access was low and irregular household income: a mean monthly household income of USD 42.30 (range: USD 8.00–110.00) left most households unable to purchase adequate food beyond subsistence-level staples. The Coping Strategies Index (CSI) reinforced these findings, with a mean score of 21.4 (SD = 7.1), indicating frequent reliance on severe coping behaviours such as reducing meal portions, skipping meals entirely, and purchasing food on credit. Only 18.9% of households (n = 10) reported having any

consistent surplus income available for food purchases beyond maize meal and cooking oil. These baseline conditions confirm that the sample population entered the programme from a position of significant economic vulnerability, with limited capacity to independently secure dietary adequacy through market channels alone.

4.1.2 Food Utilization

Baseline dietary diversity, assessed through the Household Dietary Diversity Score (HDDS), painted a picture of markedly poor nutritional quality prior to garden participation. The mean HDDS across the 53 households was 3.2 (SD = 1.1) out of a possible 12 food groups, placing the sample squarely within the low dietary diversity band as defined by the FAO classification framework (scores ≤ 3). Consumption was heavily concentrated in only three food groups—cereals (98.1%), fats and oils (79.2%), and vegetables (37.7%)—with near-absent consumption of animal-source foods, pulses, and fruits. The Food Consumption Score (FCS) corroborated this finding: the mean FCS was 23.4 (SD = 8.6), with 60.4% of households (n = 32) falling within the “poor” food consumption category (FCS < 28) and a further 24.5% (n = 13) in the “borderline” band. These scores indicate that the majority of respondents were subsisting on nutritionally monotonous diets dominated by starchy staples, with insufficient intake of micronutrient-dense foods. The data establish a clear and measurable baseline of nutritional deprivation against which the impact of garden participation can be evaluated.

4.3 Food Availability

Before participating in the nutrition gardens, household food availability was characterized by chronic shortfalls and pronounced seasonal vulnerability. The Months of Adequate Household Food Provisioning (MAHFP) score, which captures how many months per year a household has sufficient food, yielded a mean of only 5.1 months (SD = 2.0) across the 53 respondents indicating that households experienced food inadequacy for an average of nearly seven months annually. The lean season, spanning approximately October to March, was identified by 83.0% of respondents (n = 44) as the period of greatest food stress, during which household food stocks were consistently depleted and purchasing power insufficient to compensate. Production capacity

at baseline was negligible: 88.7% of households (n = 47) had no active food garden and relied entirely on purchased or transferred food. The remaining 11.3% maintained small informal plots but reported yields too erratic and insufficient to meaningfully reduce household food gaps. Community-level food system fragility was further reflected in the finding that 56.6% of respondents had received food assistance at least once in the twelve months preceding the study, signaling widespread structural inadequacy of local food supply. These baseline availability conditions underscore the significance of the nutrition garden intervention as a structural response to persistent, seasonally patterned food supply failure.

4.2. Contribution of the nutrition gardens to the food availability of the household.

The contribution that the female respondents' nutrition gardens made toward the food security of the household was assessed via a paired statistical analysis of daily meal frequency pre and post-VBU, a perception survey to ascertain the improvement in food availability, and qualitative data on food variety, dietary changes, and the seasonal impact of the gardens.

4.2.1. Number of meals per day: Pre and Post Joining VBU

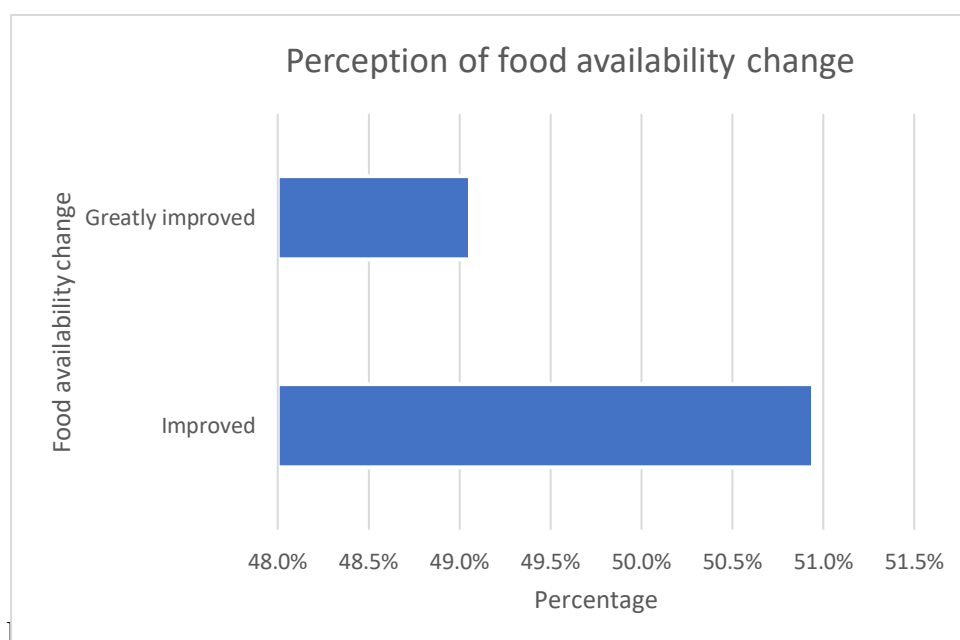
Of particular note is the significant increase from one meal per day to nearly three and a half meals per day among respondents' membership. Table 1 illustrates the progression in the number of meals consumed per day from a mere 1.75 (SD = 0.48) before joining the VBU program to a more substantive average of 3.45 (SD= 0.50). This was a notable increase of nearly two meals.

Table 1 Comparison of daily meal frequency before and after joining the nutrition garden

Metric	Before Garden	After Joining	Change	p-value
Mean meals/day	1.75	3.45	+1.70	<0.001

Metric	Before Garden	After Joining	Change	p-value
Median meals/day	2	3	+1	<0.001
1 meal/day (n)	14 (26.4%)	0 (0.0%)	—	—
2 meals/day (n)	38 (71.7%)	0 (0.0%)	—	—
3 meals/day (n)	1 (1.9%)	29 (54.7%)	—	—
>3 meals/day (n)	0 (0.0%)	24 (45.3%)	—	—
Skipped meals (30 days)	n/a	0 (0.0%)	—	—

The results were statistically supported by a paired t-test with $t=20.36$ and $p<0.001$ suggesting a highly significant difference. Majority of the households (98.1%) prior to joining the VBU program consumed only 1-2 meals per day; none consumed more than three meals. On the other hand, post-VBU membership, all (100%) respondents were able to eat more than 3 meals a day and 45.3% of the sample consumed more than 3 meals per day. All respondents (100%) skipped no meals in the past 30 days (compared to before, when no data was available to suggest whether



meals were being skipped), this is a great improvement. Every respondent (100%) claimed that their food availability has 'Improved' (50.9%)

or 'Greatly improved' (49.1%) since joining the VBU. The top reason given for the improvement in food availability was income gained from the garden (69.8%), followed by direct food availability (28.3%). One respondent said women's empowerment (1.9%) which acknowledges the impact of gender role changes in their households.

4.2.2 All-year Garden production and diet diversification

Across all of the sites, there was universal agreement about year-round production of gardens; 98.1% of all respondents indicated that their garden provided all year-round food because they use boreholes, river or dam water to irrigate their gardens. Over 2/3rds of the respondents reported that their gardens supplied 4-6 months of household needs (66.0%), about a third of them supplied food for 7-9 months (32.1%), and less than 2% supplied food for 10-12 months (1.9%). Though garden supplies still do not meet the needs of most households on an entire year basis, these figures reveal a dramatic reduction in the lean months for hunger.

With regard to dietary changes noted qualitatively, people reported a shift from monotonous maize-based diets to diets that included a wider variety of leafy covo, tomatoes, onions, legumes, butternuts, and cabbage. The qualitative implications of this for adequate micro nutrient intake for under five children were enormous. Qualitative evidence indicates that when women garden, they focus on household consumption, and this is directly linked to improved child nutrition. Similar findings have been reported in Bangladesh and Cambodia (Ruel et al. 2018).

For all four VBUs, food availability improved universally, though what was grown differs by VBU; for example, cabbage, beans, tomatoes, and other vegetables were common in Mutungagore (borehole irrigation) whilst beans, vegetables, butternuts, and maize were commonly grown in Usavi, Evergreen, and Bangure (river/dam irrigation).

4.3 Household Food Accessibility

The measure for food accessibility, how and whether households are able to, and can afford to, obtain their food based on market participation, income generation, and expenditure patterns, and

how expenditure decisions are made within households, revealed the following as the major results.

53 out of 53 households reported selling at least some of their garden produce, confirming that the gardens are not only for subsistence, but a form of income generation. Table 2 illustrates that, for the most part, the majority of households kept the largest proportion for household consumption: 47.2% kept 75% or more of what they produced, and 41.5% kept between 50% and 75% of the garden yield for household consumption, with only 11.3% reporting keeping less than half their produce (as opposed to selling more than half). This suggests that the allocation decision in most households prioritised food consumption needs.

Table 2 Food accessibility indicators for nutrition garden households (n=53)

Indicator	n	%	Notes
All households sell produce	53	100	Universal market participation
Proportion sold: <25%	25	47.2	Majority retain food for HH
Proportion sold: 25–50%	22	41.5	
Proportion sold: 51–75%	6	11.3	
Income improved food access	53	100	Universal confirmation
Income use: Medical	15	28.3	Top use category
Income use: Savings	14	26.4	

Indicator	n	%	Notes
Income use: School fees	11	20.8	
Income use: Food purchases	11	20.8	Combined food categories
Joint income-use decision	28	52.8	
Wife decides income use	16	30.2	
Husband decides income use	9	17.0	

Though relatively small proportions were sold, this had a significant impact on the household in terms of income generation to enable further food security needs; 53 out of 53 households, reported that they were able to achieve access to other foods more easily through earnings from their gardens. The biggest investment uses for the money generated from the gardens included medical care (28.3%), savings (26.4%), school fees (20.8%) and food purchases (20.8%); food purchase included only food purchases and combinations that included food purchases and others (including cash that had been spent on food). This result points to a broader understanding of food security: savings allow households to overcome the tension between competing spending pressures for cash on non-food items (e.g., school fees and medical expenses).

Women had 52.8% of control over expenditure decisions in the household, but husbands had control in 17.0% and joint control by husbands and wives accounted for the remaining 30.2% of the household expenditure decisions. Although this result indicates improvement in gender control over cash, it still indicates a gap with regard to the level of female control over the proceeds. Conversations during KIIs and FGDs showed that one consistent conflict experienced was women controlling 'petty cash' for the household, whereas the main proceeds from sales tended to be controlled by male household heads. This can be seen to constitute a structural

barrier to the fullest utilization of the returns of investment in these gardens; women contribute the labour, and the profit goes to men.

4.4 Perceived Sustainability of the nutrition garden as a food security tool

Perceived sustainability of VBUs was evaluated through a merged sustainability index (maximum score of 10), which took into consideration: water availability year-round, the use of climate-smart agriculture techniques, savings behaviour, membership in savings groups, and perceived donor independence. The primary indicators for sustainability are shown in Table 3.

Table 3 Nutrition garden household sustainability indicators

Category	Count (n = 53)	Sustainability Indicator n %
Adequate water access year-round	53	100.0
Water resilience (Conservation Agriculture practice)	32	60.4
Climate resilience (Crop rotation/mulching)	21	39.6
Climate resilience (Save income from the garden)	49	92.5
Financial sustainability (Member of savings group)	16	30.2
Financial sustainability (Can continue without donor support)	32	60.4
Donor independence: Dual extension support (AGRITEX + NGO)	53	100.0

The average household sustainability score was 7.36 out of 10. Over three quarters of households had medium sustainability (6-7 scores) and about one quarter had high sustainability (8-9 scores). None of the households achieved a score below 6, illustrating that a resilient base is

being constructed. For 39 (73.6%), the average score was 7; this indicates that most households are a little above the medium sustainability line, failing to reach high sustainability scores.

Water availability is the strongest pillar, where all 53 (100%) households confirmed availability of water on a year-round basis. Households drew their water from a number of sources: rivers (45.3%), boreholes (34.0%) and dams (20.8%). Each of these sources has different sustainability risks. Households in boreholes (Mutungagore site mostly) are least dependent on the weather; however, they rely heavily on maintenance of the solar pumping systems, whilst those who rely on river and dam households are more vulnerable to climate fluctuations. 39.6% used mulching, crop rotation, or both. Climate smart agriculture practices were used by 60.4% of respondents. It is important to note that each respondent used at least one climate smart agricultural technique as a result of the effective communication messages delivered by the dual extension agents; 100% of respondents indicated that they had access to both the AGRITEX and NGO extension agents.

A more contrasting situation was noted on the financial sustainability front. 92.5% of respondents saved money from their gardens, but only 30.2% of them were members of an official savings group. It seems that an under-utilised opportunity for individual saving groups has arisen; respondents who were members of savings groups and also save on an individual basis (n=12) showed higher resilience through having a collective cash resource readily available for any eventualities (e.g., Repair costs of equipment etc.). 60.4% of households were sure they could manage their garden without external support; 39.6% were unsure and no household felt they could not manage. The factors which caused uncertainty (Figure 5) include climate change and shocks (36%), lack of market access and linkages (32%), lack of technical knowledge (18%) and internal conflicts and inadequate leadership (14%). The high cost of upkeep on a solar powered irrigation system could be a particularly significant risk factor towards autonomous continuance as upkeep costs are more than community liquid assets available, according to KII respondents.

Table 4 indicates an across-the-board positive trend for the four VBUs with regards to food security improvement and is testament that impact is not VBU specific. While perceptions on continued donor independence varied slightly (from 57% to 64%), rates of women's involvement

did not appear to follow any particular trend (from 57.1% in Usavi to 72.2% in Mutungagore), suggesting that even while market and financial issues vary somewhat, factors for sustainability are present at all four locations.

Table 4 Cross-VBU comparative Dashboard

Indicator	Mutungagore (n=18)	Evergreen (n=10)	Usavi (n=14)	Bangure (n=11)	Overall (n=53)
Female participation (%)	72.2	70.0	57.1	63.6	66.0
Food avail. improved/greatly improved (%)	100	100	100	100	100
Water source	Borehole	River	River	Dam	Mixed
Initiator	Govt./Community	NGO	NGO/Govt.	NGO	–
% Can continue w/out donor	~61%	~60%	~57%	~64%	60.4

Chapter 5

Discussion

This chapter interprets the main conclusions from Chapter 4 based on current research, theories, and policy talks about sustainability, gender-responsive agriculture, and food security. The discussion follows the study's specific goals: (1) understanding food security status households prior to joining nutrition gardens, (2) contributions to food availability and access, and (3) how nutrition gardens are viewed in terms of sustainability for food security. Key findings are highlighted when they support, expand, or challenge previous evidence.

5.1 Food security situation

5.1.1 The Female Majority and Gendered Agricultural Labor

The finding that women made up 66.0% of VBU participants aligns with a global trend. While women own less than 20% of agricultural land in sub-Saharan Africa, the FAO (2020) and World Bank (2021) estimate that they provide 60% to 70% of agricultural labor in the region. This structural inequality in Buhera is confirmed by the study: two-thirds of the participants were female, but only 31.4% of female respondents owned land privately, compared to 83.3% of male participants. The VBU model intentionally targets women based on their roles as household food managers to improve nutritional outcomes, which explains the high female participation—it is not just a demographic coincidence (Government of Zimbabwe, 2021).

The participant profile is largely middle-aged and older; 71.7% are 36 years or older. This matches findings from similar nutrition garden programs in Malawi and Zambia, where older women show consistent participation due to limited off-farm work opportunities and a strong commitment to household feeding responsibilities (Njaya, 2019; FAO, 2020). The fact that 18.9% of participants are widowed reveals an important issue of equity: widowhood often correlates with poverty and social exclusion in rural Zimbabwe (ZIMLAC, 2023). The gardens appear to provide a safety net for this group.

5.1.2 Education, Income, and Structural Vulnerability

The program design reflects participants' low educational levels, with 52.8% having only completed primary school or less. Research by Quisumbing et al. (2015) and Doss (2014) shows that women's education strongly predicts how well households manage income and turn agricultural productivity into lasting nutrition gains. Focused training in literacy, numeracy, and business skills must be a priority for sustainability in areas with low educational levels.

VBU participants face structural challenges, as indicated by the fact that 47.2% rely on casual labor for income. Income from casual labor is often unstable, physically demanding, and lacks protection, which positions the gardens as tools for risk diversification rather than simply agricultural production sites. This supports Kairiza and Kembo's (2019) claim that nutrition gardens work best in Zimbabwe's semi-arid regions when seen as part of broader strategies for reducing vulnerability.

The influence of the Marange Apostolic Church adds a unique socio-religious angle not commonly discussed in the existing VBU research. Sources indicate that the church's ban on women attending meetings with outsiders is an overlooked barrier to their access to new information, leadership roles, and market opportunities. This highlights the importance of local gender analysis over general approaches.

5.2 Food Availability: Interpreting the Meal Frequency Gains

5.2.1 Magnitude and Significance of the Meal Frequency Increase

The average number of meals per day rose by 1.70, increasing from 1.75 to 3.45. This significant boost is noteworthy compared to findings from similar studies in Africa. For context, the FAO (2013) reported an 82% increase in household food availability from a nutrition garden in Vietnam. In South Africa, Musotsi, Mugambiwa, and Ngcobo (2020) found that families with gardens were about 50% more food secure than those without. This study corroborates earlier

findings but goes further, likely due to VBU gardens using irrigation, allowing them to produce year-round instead of only during the rainy season like most other projects.

It's not just about eating more, either. After the intervention, everyone in the study reported having at least three meals a day, with no one sticking to just one or two. This finding is not only impressive; it is backed by solid statistics (paired t-test: $t = 20.36$, $p < 0.001$). The method reinforces the results since the sample size is small and the meal data is ordinal. Importantly, 100% of these households reported not skipping a single meal in the previous month, a consistency that indicates stability in food security (FAO, 2015).

However, the data relies on participants' own reports comparing their situations before and after. This raises the possibility of recall bias or the desire to present improvements. Still, when all indicators point to a clear increase, and the statistics are strong—and when focus group discussions reflect a shift from "one pot of sadza at night" to "three meals including vegetables"—it's difficult to question the impact.

5.3 Food Accessibility

5.3.1 Gardens as Dual Instruments of Food and Income Access

All 53 households took part in selling produce. Everyone agreed that the extra income helped them buy more food. So, VBUs provide families with more to eat from their gardens and also put more money in their pockets, allowing them to purchase additional food when needed. FAO discussed this dual benefit back in 2015, and others have observed the same in Kenya, Malawi, and Zambia. Research there indicates that families with nutrition gardens eat a wider variety of foods and have better access than those who don't participate.

Most of the money earned from selling produce didn't go directly to buying more food. The largest portions went to medical expenses (28.3%), savings (26.4%), and school fees (20.8%). At first, that seems odd if you only consider food. However, it makes sense. Households know that staying healthy prevents income loss due to illness, and paying school fees. Additionally, saving money helps them prepare for future challenges. This broader view of food security shows it's

not just about what's on the table tonight, but also about health and investing in the future. Studies across sub-Saharan Africa support this: when women have a say in how income is used, they focus on health, education, and nutrition.

5.3.2 The Labour-Income Control Paradox

When examining who controls the income in these garden projects, a significant disconnect appears. Men and women work together in all tasks, whether preparing the land, planting, watering, or selling produce. But when it comes to deciding how to use the money, the situation changes. Husbands make decisions about garden income in about 36% of households. In another third, couples decide together, and only around 30% of households let women control it alone.

This gap is not new. Researchers like Njaya (2019), FAO (2021), and Quisumbing (2015) have highlighted the same “labor-income paradox” across Malawi, Zambia, and much of sub-Saharan Africa. Men often manage marketing for large harvests and the money that follows. Consequently, less of that income improves nutrition for the family as a whole.

Some respondents in this study brought this issue into sharper focus. People said that when there's a big sale, men, especially those connected to Apostolic religious groups, make the key decisions. Religion adds another layer to this widespread pattern: men, influenced by culture and belief, often control the finances.

These findings bring in a common assumption: simply involving women in these projects is not enough to improve diets. Doss (2014) has already pointed out this flaw, and it is clear that for real progress, women need more than participation; they need genuine control over income decisions. This could mean rules in the garden's constitution that guarantee women a say or changing leadership roles to prevent power from staying in the same hands.

The VBU model helps somewhat. Since these are Village Business Units based on collective decision-making, it's harder for one person, usually a man, to dominate. Focus group discussions revealed that when women collaborate in VBUs or Self-Help Groups, they gain more bargaining

power and feel more confident in their decision-making. This aligns with findings from World Vision Zimbabwe (2021), when women work together, their confidence and influence increase.

Group governance is not a perfect solution. Household and community norms, particularly those influenced by religion and tradition, often favour men in major financial decisions. That is the real challenge, changing deeper social patterns, not just garden routines.

5.4 Sustainability: Enablers, Barriers, and the Transition from Aid Dependency

5.4.1 Water Security and Climate Resilience

All respondents in the study had enough water. They all confirmed this, making it the most reliable and sustainable aspect. Water is essential for keeping community gardens alive, especially in dry areas (FAO, 2015; Murendo et al., 2018). The gardens relied on a mix of rivers, boreholes, and dams. However, each water source has its own issues, boreholes can break down, and rivers and dams can run low during dry spells.

Respondents acknowledged their understanding of climate-smart farming. Most practiced Conservation Agriculture (60.4%), and many used only crop rotation and mulching (39.6%). This shows that the extension messages made an impact, and they grasped how climate change affects their gardens. These methods also align with Zimbabwe's national strategies for climate-resilient and inclusive farming (Government of Zimbabwe, 2012).

However, Interviews showed that maintaining solar-powered irrigation systems costs more than most communities can afford. So, even with good agronomic practices, this technological barrier leaves them vulnerable in ways their farming methods cannot resolve.

5.4.2 Financial Sustainability

Almost all respondents reported that they save their income (92.5%), but only about a third (30.2%) belong to formal savings groups. This is a huge missed opportunity. Studies across

Africa consistently show that group savings, especially Internal Savings and Lending Associations (ISALs), are much more effective. They help people pool resources for buying inputs, repairing equipment, and experimenting with new crops. That leads to real financial stability (Quisumbing et al., 2015).

Only 12 out of 53 households engage in both individual saving and joining a savings group. This highlights a clear path forward: if more people join these groups, financial sustainability will improve across the board.

Another positive note is that some VBU committees are speaking with insurance companies about underwriting pump replacements. The KII data supports this, and it represents real progress. Instead of waiting for donors or the government to intervene, they are turning to insurance, similar to business practices. This shift toward market-based thinking is what experts refer to when they discuss true VBU sustainability (Government of Zimbabwe, 2021; IFAD, 2025).

5.4.3 Donor Independence

When discussing the vulnerability of gardens, people mention climate shocks, difficulty selling their produce, lack of technical knowledge, and group conflicts. These issues reflect the main barriers researchers have identified in other VBU studies. Zimbabwe's Vision 2030 and the latest Multisectoral Food and Nutrition Security Strategy emphasize building stronger market connections and value chains. These steps are crucial for making gardens financially independent (Government of Zimbabwe, 2023).

Value addition, currently, is a significant opportunity being overlooked. Processing excess produce for better prices is not happening enough. If people invested more in this area, struggling gardens could find buyers much more easily.

All 53 respondents who received support from both AGRITEX and NGOs highlighted the importance of dual extension services. In fact, those with this combined support consistently

scored higher on sustainability. This supports findings by ZIMLAC (2023) and FAO (2013): when government extension and NGO capacity building work together, the long-term results are much better than relying on just one source. However, there is a risk. People may become dependent on outside help if support continues without enough emphasis on fostering true independence. This is why training in Community-Led Monitoring and business management is crucial; they equip people with skills for self-sufficiency. As the program evolves, these trainings must remain a priority.

5.5 Theoretical Implications

These results provide important insights into nutrition-sensitive agriculture and food security on a broader scale. Examining the four pillars of food security (FAO, 2015), the VBU model clearly enhances availability. People are eating more frequently and having a greater variety of foods. It also improves access, as families earn more and spend less on food. Stability rises too due to year-round irrigation and practices that address climate risks. Regarding the utilization pillar, which concerns the quality of food and how well people can absorb it, the model enhances dietary diversity. However, we could learn even more if future studies dig deeper using detailed food frequency and dietary diversity tools.

Additionally, the findings challenge the simple link between women's participation and improved nutrition outcomes. They call for an analytical framework that distinguishes between labour participation and resource control. In the Buhera context, this distinction is confirmed, as theorized by Doss (2014) and Quisumbing et al. (2015). While female labor participation is widespread, income control is still often contested along patriarchal lines. Therefore, policy frameworks must move beyond counting participation to include institutional designs that embed gender equity in governance structures.

5.6 Implications for Policy and Programs

The evidence from this study has several practical implications for program designers, and development practitioners. Regarding food availability, focus should be on maintaining and

upgrading irrigation infrastructure, which is vital for year-round production. Food security is guaranteed when investments at community-level are paired with technical capacity for operating and maintaining irrigation systems, particularly in solar pump maintenance and water management. Partnerships with insurance providers for equipment replacement, as demonstrated in this study, should be standardised across the projects.

For food accessibility, it is important to prioritize market access development and training in value addition to complement production gains. Currently, under 25% of produce is sold below market prices, limiting income potential. Connecting with urban wholesalers, setting up collection hubs, and offering training in basic food processing (drying, packaging) will significantly improve income relative to production.

Garden constitutions and VBU governance structures must clearly affirm women's rights to income control and include provisions for rotating financial management roles to ensure gender equity in income control. Local religious and traditional leaders, including those from the Apostolic Church, are crucial for negotiating culturally embedded restrictions on women's economic agency, such as prohibitions on attending outside meetings. This recommendation aligns with suggestions from Quisumbing et al. (2015) and the Zimbabwe CAPF 2012–2032 (Government of Zimbabwe, 2012).

In terms of sustainability, increasing formal savings group membership should be a policy priority. The evidence indicates that households comprising both savings group members and individual savers are the most resilient. This suggests that support for production should go hand in hand with incentives for forming ISALs. Regular training in Community-Led Monitoring, business management, and conflict resolution should be ongoing and not treated as a one-time intervention.

5.7 Limitations of the Study

There are a few things you have to keep in mind when looking at these results. First, due to the absence of a control group of households not participating in the VBU, it is not possible to

confirm if the changes in food security happened because of the program itself. Households outside the program might have seen changes too, and there is no method for measuring that. Second, participants had to remember what their meal frequency was at the start, so their answers might reflect what they think is expected, or they just might not remember accurately. Third, with only 53 respondents, the sample we used was on par with earlier VBU evaluations, but it wasn't big enough for strong subgroup analyses. Fourth, this study is cross-sectional. That means we looked at a snapshot in time, so we can't track how food security changed for these households in the long run. Finally, we only included VBUs that were active and functioning. This introduces selection bias, likely making the program look more effective than it really is, since struggling or inactive VBUs were not included.

Conclusion

This dissertation confirms that female-run nutrition gardens, which are implemented in Buhera District as Village Business Units (VBUs), significantly improve household food security by increasing the availability of food and access to food through increased income and partial resilience, though they still exist within contexts of persistent gender inequalities. Profiling showed that those involved in the gardens are primarily middle-aged women with poor formal education and no/limited ownership of land, thus situating garden activity within specific contexts and constraints.

The key findings confirm that participation in the garden significantly increases meal frequency and dietary diversity, and especially consumption of vegetables and legumes. Increased income from garden products is used not only to purchase food but also for a range of essential non-food household needs, thereby confirming the gardens function as both a food and income generating initiative. However, the study also confirms that female control over garden income is not enhanced by the intervention, demonstrating that the gendered paradox of input versus outcome for women persists.

A sustainability analysis found moderate to high resilience of environmental factors and support systems; however, vulnerabilities lie within financial systems, marketing linkages and affordable access to irrigation-implying a continued reliance on donor assistance.

In terms of contributions, the empirical contribution is that of context-specific evidence that female-led, irrigated nutrition gardens can improve season food insecurity and diet in agroecological region V of Zimbabwe. The theoretical contribution adds to livelihood and gender analysis by further discriminating between input and outcome at the household level and providing evidence of the importance of analysing the control and appropriation of benefits, especially through negotiation, intra-household politics and intra-household decision-making processes. The policy implications focus on the synergy between agricultural investments,

gendered reforms of governance and market access, and financial inclusion so that the gains for both livelihoods and food security can be maximized and sustained.

In achieving the research aims of the dissertation, participation was profiled and the context was explored and then the effect of the garden in contributing to food security was demonstrated, and a sustainability analysis was performed, pointing to some key areas of vulnerability.

There are several limitations in the study including, that a non-participating control group was not included in the study design, the study relied solely on self-reported data, the study size was relatively small, and it only focused on the VBUs that were actively engaged in garden activity and thereby it is impossible to causally attribute changes to the VBUs.

Future research would benefit greatly by adopting longitudinal and quasi-experimental study designs that incorporate matched controls so as to investigate causal impacts and changes over time. Samples would also benefit from being larger and stratified to explore heterogeneities of households and their governance structures. There is a clear need for in-depth analysis of intra-household dynamics and a direct testing of governance interventions that can help women achieve control over income. More investigation is also warranted into market-oriented initiatives such as value addition and affordable, sustainable access to water that will ensure that the interventions are commercially viable over the long term and not dependent on donor assistance.

Overall, this dissertation confirms that the female-run, irrigated nutrition garden has the potential to significantly impact on food security in contexts of high vulnerability; however, this intervention cannot be seen as entirely transformative for achieving gender equity within the household.

REFERENCES

- Action Contre la Faim. (2019). *Low input gardens improve nutrition and empower women in rural areas*.
- Chamber of Mines of Zimbabwe. (2021). *Annual mining industry report*. Harare: Chamber of Mines of Zimbabwe.
- Chitongo, L. (2021). *Food insecurity in rural Zimbabwe: Coping strategies and challenges*.
- Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.
- Department for International Development (DFID). (1999). *Sustainable livelihoods guidance sheets*. DFID.
- DevelopZim (2025) 'Women-led Village Business Units transforming rural livelihoods in Zimbabwe.' DevelopZim Online. Available at: <https://developzim.com> [Accessed 25 May 2026].
- DevelopZim. (2025). Village business units revolutionise Zimbabwe's horticulture sector. <https://developzim.co.zw/news/innovation/village-business-units-revolutionise-zimbabwes-horticulture-sector/2945/>
- Doss, C. (2014) 'If women hold up half the sky, how much of the world's food do they produce?', *Gender, Place and Culture*, 21(3), pp. 1–19.
- Doss, C. (2014). If women hold up half the sky, how much of the world's food do they produce? *Global Food Security*, 2(1), 24–31.
- FAO (2013) *The State of Food and Agriculture 2010–11: Women in Agriculture – Closing the Gender Gap for Development*. Rome: Food and Agriculture Organization of the United Nations.
- FAO (2015) *The State of Food Insecurity in the World 2015: Meeting the 2015 International Hunger Targets: Taking Stock of Uneven Progress*. Rome: Food and Agriculture Organization of the United Nations.

FAO (2020) Gendered Innovations in Agricultural and Food Systems: New Evidence from the Field. Rome: Food and Agriculture Organization of the United Nations.

FAO, IFAD, UNICEF, WFP and WHO (2023) The State of Food Security and Nutrition in the World 2023. Rome: FAO.

FAO, IFAD, UNICEF, WFP and WHO (2024) The State of Food Security and Nutrition in the World 2024. Rome: FAO.

FNC (2025) Female-led Nutrition Gardens and VBU Programme Report. Harare: Food and Nutrition Council.

Food and Agriculture Organization (FAO). (2011). *The state of food and agriculture 2010–2011: Women in agriculture – Closing the gender gap for development*. FAO.

Food and Agriculture Organization (FAO). (2015). *The state of food insecurity in the world*. FAO.

Food and Agriculture Organization (FAO). (2023). *The state of food security and nutrition in the world 2023*. FAO.

Food and Nutrition Council (FNC). (2023). *Buhera district food and nutrition security profile*. Harare: FNC.

Food and Nutrition Council (FNC). (2025). *Optimising rural livelihoods in Zimbabwe: Technical report*. Harare: FNC.

Government of Zimbabwe (2012) Zimbabwe Comprehensive Agricultural Policy Framework (CAPF) 2012–2032. Harare: Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement.

Government of Zimbabwe (2021) Presidential Rural Development Programme: Village Business Units Operational Guidelines. Harare: Office of the President and Cabinet.

Government of Zimbabwe (2023) Multisectoral Food and Nutrition Security Strategy 2023–2025. Harare: Food and Nutrition Council.

Government of Zimbabwe. (2012). *Comprehensive agricultural policy framework 2012–2032*. Ministry of Agriculture and Lands. <https://inms.international/lex-faoc068640>

Government of Zimbabwe. (2021). *Zimbabwe national development strategy 1 (NDS1) 2021–2025*.

Government of Zimbabwe. (2023). *Multisectoral food and nutrition security strategy 2023–2025*. <https://www.fnc.org.zw/documents>

- Government of Zimbabwe. (2023). *Village business units programme implementation framework*. Harare: Government of Zimbabwe.
- Gukurume, S. (2019). Gender, power and food security in Zimbabwean rural households. *African Journal of Gender Studies*, 11(1), 45–62.
- IFAD (2025) Smallholder Agriculture Cluster Project (SACP) Annual Report 2024. Rome: International Fund for Agricultural Development.
- Institute of Sustainable Development Studies (ISDS). (2019). *Community gardens and resilience in Gweru district*.
- International Fund for Agricultural Development (IFAD). (2025). *Supervision mission report on Smallholder Agricultural Cluster Project*. IFAD.
- Kairiza, T. and Kembo, G. (2019) 'Household food insecurity in Zimbabwe: the role of smallholder farmers' market participation', *African Journal of Agricultural and Resource Economics*, 14(3), pp. 213–225.
- Kairiza, T., & Kembo, G. (2019). Coping with food and nutrition insecurity in Zimbabwe: Does household head gender matter? *Agricultural and Food Economics*, 7(24), 1–17.
- Magwegwe, T. (2024). Gender and agricultural interventions in rural Zimbabwe: Emerging patterns. *Zimbabwe Journal of Development Studies*, 19(1), 77–96.
- Mapfumo, J., & Dube, T. (2022). Gender roles in food security interventions in Zimbabwe. *Journal of Development and Sustainability*, 8(3), 122–138.
- Matsa, M., & Muringayi, C. (2020). Climate variability and rural livelihoods in Zimbabwe. *Southern African Journal of Environmental Studies*, 27(1), 88–101.
- Matsa, T., & Muringayi, V. (2020). Climate variability and agricultural livelihoods in agro-ecological region V: Implications for food security in Zimbabwe. *Zimbabwe Journal of Environmental Studies*, 12(2), 45–62.
- Meteorological Services Department. (2022). *Climate data report for Manicaland Province*. Government of Zimbabwe.
- Moyo, S. (2019). The role of community gardens in food security in Zimbabwe. *Journal of Agriculture and Food Systems*, 7(2), 59–71.
- Murendo, C., Mazvimavi, K., & Nhau, B. (2023). Linking production diversity and household dietary diversity in rural Zimbabwe. *Food Policy*, 117.

- Murendo, C., Nhau, B., & Mazvimavi, K. (2018). Nutrition education and farm production diversity: Evidence from Zimbabwe. *Food Security*, 10(6), 1435–1450.
- Murendo, C., Wollni, M., De Brauw, A. and Mugabi, N. (2018) 'Social network effects on mobile money adoption in Uganda', *Journal of Development Studies*, 54(2), pp. 327–342.
- Musotsi, P., Mugambiwa, S.S. and Ngcobo, N. (2020) 'Community food gardens and food security in South Africa: evidence from Limpopo Province', *Jàmbá: Journal of Disaster Risk Studies*, 12(1), pp. 1–9.
- Mutambara, J., Chikerema, S., & Nyoni, P. (2021). Community nutrition gardens and household resilience: Evidence from rural Zimbabwe. *Journal of Rural Development and Agriculture*, 9(1), 77–96.
- Njaya, F. (2019). *Gender and garden labour in Africa*.
- Njaya, T. (2019) 'Gender and labour dynamics in smallholder horticulture: evidence from Mutoko and Goromonzi districts of Zimbabwe', *African Journal of Agricultural Research*, 14(28), pp. 1170–1181.
- Quisumbing, A. R., Meinzen-Dick, R., Raney, T., Croppenstedt, A., Behrman, J. A., & Peterman, A. (2015). *Gender in agriculture and food systems*. Springer.
- Quisumbing, A.R., Meinzen-Dick, R., Raney, T.L., Croppenstedt, A., Behrman, J.A. and Peterman, A. (eds.) (2015) *Gender in Agriculture: Closing the Knowledge Gap*. Dordrecht: Springer.
- Ruel, M.T., Quisumbing, A.R. and Balagamwala, M. (2018) 'Nutrition-sensitive agriculture: what have we learned so far?', *Global Food Security*, 17, pp. 128–153.
- SACP (2025) *Smallholder Agriculture Cluster Project Progress Report: Gender and Nutrition Outcomes*. Harare: Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement.
- Southern African Cluster Project (SACP). (2025). Village business units – bringing hope for improved nutrition and increased incomes. <https://sacp.co.zw/village-business-units-bringing-hope-for-improved-nutrition-and-increased-incomes/>
- Timberlake, J., & Chidumayo, E. (2011). *Miombo ecoregion: Vegetation and ecology of the miombo woodlands*. Southern African Botanical Diversity Network.
- Vincent, V., & Thomas, R. G. (1960). *An agricultural survey of Southern Rhodesia: Part I – Agro-ecological survey*. Government Printer.

- World Bank (2021) *Agriculture and Food: Gender in Agriculture Sourcebook*. Washington, DC: World Bank Group.
- World Bank. (2021). *World development report on food security*. World Bank.
- World Vision Zimbabwe (2021) *Community Nutrition Garden Programme Evaluation Report*. Harare: World Vision International.
- World Vision Zimbabwe. (2021). *Women fight hunger through community gardens in Zimbabwe*. Harare: World Vision.
- Zimbabwe Coalition on Debt and Development (ZIMCodd). (2021). *NDS1 gender and social justice analysis*. <https://zimcodd.org/wp-content/uploads/2021/01/NDS1-Analysis-Gender-and-Social-Justice-Perspective.pdf>
- Zimbabwe Livelihoods Assessment Committee (ZIMLAC). (2023). *Zimbabwe rural livelihoods assessment report*. Harare: ZIMLAC.
- Zimbabwe National Development Strategy 1 (NDS1) (2021–2025) (2021) *Official government strategy*.
- Zimbabwe National Statistics Agency (ZIMSTAT). (2022). *Zimbabwe national household food and nutrition survey*.
- Zimbabwe National Water Authority (2023) *Village Business Units Irrigation Programme Report*
- ZIMCodd (2021) *NDS1 Gender and Social Justice Analysis*. [Online] Available at: <https://zimcodd.org/wp-content/uploads/2021/01/NDS1-Analysis-Gender-and-Social-Justice-Perspectives.pdf?utm>
- ZIMLAC (2023) *Zimbabwe Livelihoods Assessment Committee Report 2023: Food Security and Livelihood Analysis*. Harare: Ministry of Public Service, Labour and Social Welfare.
- ZIMSTAT (2022) *Zimbabwe National Household Food and Nutrition Survey*.
- ZIMSTAT (2022) *Zimbabwe National Statistics Agency Report on Agricultural and Rural Households 2022*. Harare: Zimbabwe National Statistics Agency.

APPENDIX

QUESTIONNAIRE

Title: Assessing how Female-led Nutrition Gardens (Village Business Units) improve household food security: A gendered analysis of Buhera District.

Introduction:

My name is Chipu Tokotore, and I am conducting a study on how female-led nutrition gardens (Village Business Units) improve household food security in Buhera District. Your participation is voluntary, and all information provided will be treated with strict confidentiality and used for academic purposes only.

QUESTIONS (Tick where appropriate)

Demographic Information

1. Age of respondent: _____ years
2. Marital Status:
☐ Single ☐ Married ☐ Widowed ☐ Divorced ☐ Separated
3. Highest level of education:
☐ No formal education ☐ Primary ☐ Secondary ☐ Tertiary
4. Household size: _____ persons
5. Number of children under 5 years: _____
6. Main household income source:
☐ Farming ☐ Casual labour ☐ Remittances ☐ Small business ☐ Other _____
7. Do you personally own land?
☐ Yes ☐ No

8. Who controls income from the garden?
☐ Self ☐ Husband ☐ Joint decision ☐ Other _____

Garden Participation Characteristics

1. Duration of participation:
☐ Less than 1 year ☐ 1–3 years ☐ 4–6 years ☐ More than 6 years
2. Who initiated your participation?
☐ NGO ☐ Government ☐ Self ☐ Community leader
3. Who owns the garden land?
☐ Community ☐ Joint ☐ Other _____
4. Who decides what crops to grow?
☐ Men ☐ Women ☐ Joint ☐ Group decision

1. Who performs the following tasks?

Task	Women	Men	Both	Other specify
Land preparation				
Planting				
Watering				
Post-Harvest Activities				
Selling				

2. Who has access to the following resources?

Resource	Women	Men	Community	Group	Other specify
Land					
Water					
Inputs					
Garden tools					

Food Availability

1. What crops are commonly grown in the nutrition garden?
2. Do you harvest vegetables throughout the year?
☐ Yes ☐ No ☐ Seasonal

3. Garden contribution to food (months per year):
☐ 1–3 ☐ 4–6 ☐ 7–9 ☐ 10–12
4. Compared to before joining:
☐ Greatly improved ☐ Improved ☐ No change ☐ Worsened
5. If there is any change, what exactly has changed _____

6. Current meals per day:
☐ One ☐ Two ☐ Three ☐ More than three
7. How many meals per day did you have before joining the garden:
8. ☐ One ☐ Two ☐ Three ☐ More than three
9. If there is a difference in the number of meals per day why is it like that _____

10. In the past 30 days, did your household skip meals?
☐ Yes ☐ No

Food Accessibility

1. Do you sell produce?
☐ Yes ☐ No
2. If yes, what proportion is sold:
☐ <25% ☐ 25–50% ☐ 51–75% ☐ >75%
3. Use of income:
☐ Food ☐ School fees ☐ Medical ☐ Savings ☐ Other _____
4. Has income improved food access?
☐ Yes ☐ No

5. Who decides how income is used?

☐ Self ☐ Husband ☐ Joint ☐

Other _____

Sustainability

1. Main water source:

☐ Borehole ☐ River ☐ Dam ☐ Well

2. How reliable is your water source?

3. Which months of the year do you use water from each source for irrigation?

4. What is the irrigation method used?

5. Is water from your source adequate to support production?

6. If not, what methods are you using to sustain production?

7. Which climate-smart agriculture practices are you using?

8. Do you save income?

☐ Yes ☐ No

9. Member of savings group?

☐ Yes ☐ No

10. Can the garden continue without donor support?

☐ Yes ☐ No ☐ Not sure

11. Why do you think so?

FOCUS GROUP DISCUSSION

Study Title: Assessing how Female-led Nutrition Gardens (Village Business Units) improve household food security: A gendered analysis of Buhera District

Introduction by Moderator

Good day and thank you for agreeing to participate in this discussion.

The purpose of this discussion is to gather information on how female-led nutrition gardens contribute to household food availability and food access in Buhera District. Your participation is voluntary, and all information provided will be treated with strict confidentiality and used for academic purposes only.

1. How do female-led nutrition gardens contribute to household food availability and accessibility?
2. What are the major challenges affecting your nutrition garden?
3. What should be done to ensure the gardens continue in the future?
4. What recommendations would you give to improve nutrition gardens?
5. Is there anything else you would like to share about nutrition gardens and household food - availability and access?

KEY INFORMANT INTERVIEWS

For AGRITEX officers, NGO staff, and community leaders

1. What is the role of female-led nutrition gardens in improving food security in Buhera?.....
2. How do gender power relations influence nutrition garden outcomes in Buhera?.....
.....
.....
3. Have the gardens improved food Availability and Accessibility.....
.....

4. Are there cultural norms limiting women's control over income?.....
.....
5. How sustainable are these gardens without external support?.....
.....