Assessing the Role of Urban Agricultural Backyard Enterprises on Household Food Security and Income: A case of Rimuka Gamepark suburb, Kadoma District

A dissertation submitted in partial fulfilment of the requirements for the Bachelor of Science Honours in Agricultural Economics and Management.

Bindura University of Science Education

Faculty of Agriculture and Environmental Science

Department of Agricultural Economics, Education and Extension

Lorraine Tanatswa Jere

B202160B

Academic Advisor/Supervisor: Dr A.C Mujeyi

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Name of Candidate: LORRAINE TANATSWA JERE

Reg Number: B202160B

Degree: Bachelor of Science Honours in Agricultural Economics and Management.

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Name of supervisor: Dr. Angeline C Mujeyi

Signature: 

Date: 31/5/24

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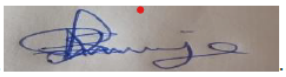
The undersigned certify that they have read this research project and have approved its submission for marking in relation to the department's guideline and regulations.

Student..LORRAINE T JERE.....

Signature..  .....
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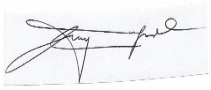

DECLARATION

l hereby declare that the research project entitled "**Assessing the Role of Urban Agricultural Backyard Enterprises on Household Food Security and Income: A case of Rimuka Gamepark suburb, Kadoma 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 Dr. Angeline C. Mujeyi. This work is submitted in partial fulfilment of the requirements for the award of a Bachelor of Science Honours in Agricultural Economics and Management. The results embodied in this thesis have not been submitted to any University or Institute for the award of any degree of diploma.

Author: LORRAINE TANATSWA JERE
Reg Number: B202160B
Signature: *Ljere*
Date: 31 MAY 2024

DEDICATION

l dedicates this project to my loving and caring mother, friends, supportive supervisor and relatives. Special thanks to the almighty God who led me through the whole process of my project without any health problems; l could not have done it without you.

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Firstly, l would like to thank God for enabling me to do my project, giving me the understanding and wisdom to work on this project and make it a success. l would like also like to thank my mother Tarisai Mangozho for her care, emotional and financial support and my friend Christine Banda for her continuous support throughout the project. My thanks also go to my supervisor Dr A Mujeyi and all lecturers in the Department of Agricultural Economics, education and Extension for their great work, advice and intellectual support on this project.

In conclusion, l expresses my appreciation to agricultural backyard entrepreneurs in Gamepark Rimuka, Kadoma for their conveyed viewpoints and willingness during data collection.

ABSTRACT

Agricultural backyard enterprises are essential in promoting food security and household income. Crop and livestock diversification have shown to considerably boost revenue and standards of living for the people. Although it has great potential to be a solution for food security, backyard farming faces challenges, including less intensive cultivation and a lack of specialized technologies. Therefore, the purpose of this research is to evaluate the role of agricultural backyard enterprises in contributing to household income and food security in Rimuka Game Park, Kadoma District. This study aims to shed light on the potential of backyard agricultural businesses to improve food security and reduce poverty at the household level by looking at the experiences of these households and analysing the variables that affect their performance. The collected information from 82 respondents made use of self-administered questionnaires and interviews. Frequency analysis were used to identify the types of agricultural backyard enterprises in Gamepark Rimuka, Kadoma and gross margin analysis was used to assess the profitability of these enterprises. Poisson regression analysis assessed the impact of agricultural backyard enterprises on food security. Multiple linear regression analysis assessed the contribution of agricultural backyard enterprises to household income and SWOT analysis identified challenges faced by agricultural backyard enterprises in Rimuka Game Park. The results revealed agricultural backyard enterprises were statistically significant in contributing to household food security and the types of agricultural enterprises includes, vegetables, poultry, fruit orchard, dried grains, rabbit and dog breeding. Agricultural backyard incomes were significant at a 5% level of significance in contribution to household income and dog-breeding being the most profitable enterprise with return per dollar invested of $4, vegetables with $3.85 return per dollar invested, fruit orchard with $3 dollar per dollar invested, dried grains is the least paying enterprise with return per dollar invested of $ 1.60. Agricultural backyard enterprises face multiple challenges including, shortage of finance, limited space and unavailability of machinery. Therefore, from results drawn, implementation of policies to foster education of backyard farmers on precision agriculture and extension services is crucial because knowledge through education is power. The implementation of policies such as free input subsidies and programs that support the availability and affordability of diverse, nutrient-rich food in Kadoma is also helpful.

Keywords: Agricultural backyard enterprises, food security, household income, SWOT Analysis, multiple linear regression, Poisson regression.

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LIST OF ABBREVATIONS

ANOVA	**ANALYSIS OF VARIANCE**
HDDS	**HOUSEHOLD DIETARY DIVERSITY SCORE**
SWOT	**STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS**
TVC	**TOTAL VARIABLE COST**

CHAPTER ONE: 1.0 INTRODUCTION

1.1 Background of the study

Agricultural backyard enterprises are critical to promoting dietary diversity and household income. Crop and livestock diversification has considerably boosted farm revenue and food security (Achonga B.O;Akuja T.E;Kimatu J.N, 2015). Agricultural backyard enterprises are expanding rapidly worldwide, particularly in underdeveloped countries. Backyard gardening in Nigeria is economical and helps to improve food security and alleviate poverty (Oke, 2024). In China, rural firms have been significant drivers of economic growth, with post-Mao times seeing a quadrupling of enterprises and an increase in employment. In India, the horticulture sector, including backyard businesses, has made considerable contributions to GDP and exports (Lather, 2021).

Dietary diversity in Zimbabwe has been found be positively impacted by backyard agricultural businesses, such as the production of crops and cattle (Conrad Murendo,Dowsen Sango,Claudious Hakuna, 2023). Improved nutrition among smallholder farmers depends on these businesses, especially the production of fruits, vegetables, and pulses (Conrad Murendo,Brighton Nhau,Kitizo Mazvimovi, 2018). Nevertheless, there is not always a statistically significant correlation between nutritional variety and agricultural diversification (Chewe Nkonde,Pamela Marinda, 2021). Interventions like nutrition education and market access should be encouragedto improve the influence of these businesses on dietary variety (Murendo, 2018). Backyard agricultural businesses such as market involvement, agricultural diversification, and sustainable intensification techniques, favourably affect food variety in several African nations. Adoption of sustainable intensification techniques such as crop rotation, minimum tillage, and intercropping enhanced crop diversity and productivity in Zambia and Zimbabwe, which has resulted in a greater diversity of diets (Hambulo Ngoma,Esau Simutowe,Mark Manyanga, 2023). Similarly, increased household dietary diversity in rural regions links to agricultural diversification, especially the production of a range of crops and livestock (Nkonde, 2021). Market participation, especially in output markets, increases dietary diversity; over time, this effect becomes greater (Mulenga, 2021).

Backyard farming, which includes home gardens and non-farm businesses, considerably increases household income and food security (Ovharhe, 2020). Backyard farming is popular among women in Nigeria and it links to high levels of output and food security satisfaction (Ovharhe, 2020).

Participating in non-farm businesses increases agricultural income and consumption expenditures in rural India (Zeeshan Ali,Mahummad Kamran, 2019). However, food security and food sovereignty may suffer because of family gardens, which are commercialized in Indonesia (Abdoellah, 2020). Despite this, home garden farming is sustainable and generates revenue for households in Yogyakarta City, Indonesia (I. Irham,M Johari, 2021). In Southern Africa, backyard agricultural businesses have a major impact on household income. Key determinants of backyard farming income generation includes the gender of the household head, formal employment, farm ownership, farming experience, and annual income from animals (Mokone, 2018). Demonstrated small-scale agribusinesses and household income-generating ventures produce income and jobs, with agro-processing companies exhibiting greater mean gross margins (Lucy Maliwichi, L Sifumba, 2010).

Backyard agricultural enterprises encounter several obstacles and constraints. These consist of financial limitations, psychological and technological obstacles, and restricted resource access (Md Mubeena.T Lakshmi, 2021). Financial, water, and market access issues impede commercial farming, especially on a small scale (M Muzekenyi,J Zuwarimwe, 2023). Nevertheless, innovative approaches have been effective in overcoming these constraints and empowering smallholder farmers, as demonstrated by the Science and Technology Backyard platform (Zhang,Y Jacobs, 2016). Although it has the potential to be a solution for food security, backyard farming has drawbacks, including less intensive cultivation and a lack of specialized technologies (Yani, 2012).

Therefore, the purpose of this research is to assess the role of agricultural backyard enterprises in contributing to household income and food security in Rimuka Game Park, Kadoma District. This study aims to shed light on the potential of backyard agricultural businesses to improve food security and reduce poverty at the household level by looking at the experiences of these households and analysing the variables that affect their performance.

1.2 Problem statement

Food security is a critical concern for many households and communities, particularly in Gamepark Rimuka, Kadoma district where access to nutritious and affordable food is limited due

to poverty and high unemployment rates. Agricultural backyard enterprises, which involve small-scale agricultural activities carried out within the area, promoted as a potential solution to address food security and source of income challenges. However, the specific impact of these enterprises on food security and household income remains unclear. Despite the increasing popularity of urban backyard enterprises as a means of improving food security, little information is clear about their actual contribution to food security and household income in Gamepark Rimuka, Kadoma district, Zimbabwe. In order to develop effective policies and interventions that promote agricultural backyard enterprises and improve food security, it is crucial to have a better understanding of the role these enterprises play and their statistical importance in providing food and income for local communities. Therefore, this research aims to assess the contribution of urban backyard enterprises to food security in the Kadoma district, Zimbabwe.

Research questions

1) What are the types of urban backyard enterprises in Rimuka Gamepark and what cost and profitability are associated with them?

2) What is the impact of agricultural backyard enterprises on household food security?

3) What is the contribution of agricultural backyard enterprises to household income in Rimuka Game Park?

4) What are the challenges faced by urban backyard enterprises in Rimuka Game Park?

1.4 MAIN OBJECTIVE

1): To Assess the Role of Urban Agricultural Backyard Enterprises on Household Food Security and Income: A case of RimukaGameparksuburb, Kadoma District

1.4.1 Objectives of the study

2) To identify the types of agricultural backyard enterprises in Rimuka Game Park and evaluate the cost and profitability associated with them.

3) To assess the contribution of agricultural backyard enterprises to household food security.

4) To assess the contribution of agricultural backyard enterprises to household income in Rimuka Game Park.

5) To identify challenges faced by agricultural backyard enterprises in Rimuka Game Park.

1.5 Justification

Food security is a pressing global issue, with people facing hunger and malnutrition. Exploring the role of agricultural backyard enterprises offers solutions toaddress food security challenges at the local level and understanding their impact can inform strategies for improving food availability and access. In addition, examining their role in household income can provide insights to policymakers about poverty alleviation and formulate policies that promote these agricultural backyard enterprises. Exploring the role of these enterprises also sheds light on the challenges they face and identifies strategies to support their effort. The lack of information on these agricultural enterprises hinders the design and implementation of effective policies and programs to promote their growth. This study aims to fill an important knowledge gap and provides an opportunity to generate evidence-based insights that can guide future interventions and policies.

1.6 Delimitations and limitations of the study

Geographic Scope: The study focuses specifically on Rimuka Game Park, Kadoma that may limit the generalizability of the findings to other regions or districts. The unique characteristics, socio-economic conditions, and geographical factors of Rimuka Game Park, Kadoma may not be representative of other areas, potentially affecting the transferability of the results.

Time constraints: It will take a lot of time to conduct an extensive study on the relationship between dietary diversity, household income, and agricultural backyard operations. Time constraints may make it more difficult to gather enough information and carry out in-depth analysis.

Respondent bias: The student may run into possible prejudice in the answers that study participants provide. The accuracy of the results may have been influenced by respondents' overstatement or understatement of their involvement in backyard agricultural businesses, dietary diversification habits, or household income.

Resource constraints: Insufficient funds may prevent students from carrying out extended fieldwork, buying essential equipment, or employing additional research assistance.

Limitations on sample size: It could be challenging to get a representative sample of the homes in the study area operating backyard farms which could have an impact on how broadly applicable the results are.

1.7 Organization of chapters

Chapter 1

This chapter will outline the study's background and research problem, which focuses on the role of backyard agricultural enterprises on household income and dietary diversity in the Kadoma district's Rimuka Game Park. The chapter will also address the objectives, statement of problem, study limitations, study delimitation, organization of the chapter, and summary.

Chapter 2

The objectives, questions, and theories/ conceptual framework of the study will guide how the literature review addresses the topic. This chapter describes a literature review and examines the research conducted by past scholars on the role of backyard agriculture enterprises on household income and dietary diversity.

Chapter 3

This chapter will discuss the research methodology, research design, target population, sample size, sampling strategy, research tools, data collection methods, and ethical considerations. There will also be a full justification and explanation of the research methodologies.

Chapter 4

Data collection, analysis, presentation, and interpretation are represented in this chapter. In this chapter, the research objectives and questions are answered and evaluated.

Chapter 5

This chapter will complete the discussion after Chapter 4's analysis by presenting the study's conclusions and observations in detail, as well as assessing the role of agricultural backyard enterprises on dietary diversity and household income in Rimuka Game Park, Kadoma district.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

2.1 Definition and characteristics of agricultural backyard enterprises

According to (Galvan, 2019), backyard agricultural businesses are small-scale production systems that support regional economies and food security. These businesses frequently produce a range of animals and crops with an eye toward local commerce and self-consumption (K González-Felix,V Manuel-Peinado Guevara, 2021). As demonstrated by the Science and Technology Backyard concept in China (Jiao, 2019), they may also act as centres for information sharing and technological innovation. Agricultural backyard businesses are distinguished by their capacity to strengthen regional economies, augment food security, and encourage agriculture's sustainable intensification.

2.2 Importance of Food security for sustainable Development

Food security is an essential component of sustainable development, with direct implications for health and economic prosperity (Iortyom, 2023). It is both inherently and instrumentally significant since it is a fundamental human right and a crucial driver of economic progress, environmental preservation, and poverty alleviation (Barrett 2020). The agricultural industry is critical to guaranteeing food supply, especially in emerging nations where infrastructure and extension services require significant investment (Pawlak, 2020). To address food security issues, India is using sustainable agriculture methods such as non-chemical fertilizers and water-efficient irrigation systems (Bhattacharya, 2019).

2.3 Contribution of agricultural backyard enterprises to food security

Backyard agricultural businesses are essential to food security, especially in low-income nations (Ovharhe, 2020).By facilitating easy access to a variety of reasonably priced, nutrient-dense products, these businesses support food security(R Kortright, S Wakefield, 2011). Agro-ecologically effective farming methods are frequently used in these businesses, improving food security while preserving resources (Altieri, 2012). Moreover, including agro-biodiversity in these systems can aid in mitigating the effects of climate change, water shortages, and the loss of arable land (F Orsini, Remi Kahane, 2013). Researchers have shown that Backyard gardening, including rooftop agriculture, considerably improves food security in a variety of regions (Lawrence, 2022). In Nigeria, women dominate backyard farming is connected with high levels of satisfaction with farm productivity and food security (Ovharhe, 2020). Rooftop agriculture in South Africa

improves food security, affordability, and employment prospects (Lawrence 2022). However, the exclusion of the very poor and marginalized limits inclusive agribusiness's capacity to address food and nutrition security in Kenyan smallholder communities (Wangu, 2020). Policymakers and development actors should investigate alternate livelihood supports for these people (Wangu, 2020).

2.4 Conceptual framework

A contextual framework offers an organized method for comprehending and evaluating a certain subject in its larger context. It entails taking into account a range of elements, parameters, and dimensions that either impact or are influenced by the subject of study (Grande, 2021).A contextual framework aids in the organization and interpretation of data, the identification of important components and connections, and the development of a thorough comprehension of the subject matter by academics and practitioners (Schulz, 2023).

2.4.1 Sustainable Livelihood Framework

The notion known as the Sustainable Livelihoods Framework (SLF) emphasizes people's well-being and the institutions that influence their lives (Krishna, 2020). It can be defined as the activities, resources, and capacities needed to support a way of life that can withstand shocks and strains, recover from them, and preserve or improve its resources and capacities without compromising the basis of natural resources (Karki, 2021).The SLF multidisciplinary and multilevel development contacts, people-centred development and responsiveness and participation (Karki, 2021).

2.4.2 Livelihood assets

According to (Kuang, 2020), these are the resources and capabilities that individuals and households use to pursue their livelihood strategies. They are categorized into five types: human, social, natural, physical, and financial. The framework emphasizes the importance of these assets in achieving sustainable livelihoods, with a particular focus on the role of diversification in

enhancing livelihood security and improving living standards (Kandjinga Elias,Msipah Nothando, 2021).

2.4.3 Human capital

Sustainability is greatly aided by human capital, which is the knowledge, skills, and capacities of individuals (Molino, 2019).Long-term sustainability thus requires the development of human capital, and education is a crucial tool in this process (Slaus, 2011). Notwithstanding, there exist obstacles to the sustainability of human capital, including the effects of demographic shifts on the labour market and the growing involvement of youth in education. Notwithstanding these obstacles, human capital investment is essential for promoting green and sustainable development, especially in the fields of environmental protection, health care, and education (A Beisembina,Alla Gizzatova, 2023).

2.4.4 Social capital

According to (Trent A. Engbers, M Thompson, 2017), social capital is a crucial component of sustainability; it is characterized by a community's reciprocity, shared vision, and trust. It is an essential resource for corporate sustainability since it creates revenue and grants access to other resources (Orekhova, 2020).Through influencing knowledge, attitudes, and competence, social capital also affects ecologically sustainable consumer behaviour (Castaneda, 2015). Social capital is related to carrying capacity and social capacity in the context of environmental sustainability, potentially contributing to research and policy (Mauerhofer, 2013).

2.4.5 Natural assets

Natural resources and ecological systems that sustain human livelihoods and enhance societal well-being, they referred to as natural assets or natural capital. Land, water resources, forests, biodiversity, marine and coastal ecosystems, minerals and energy resources, air quality, and climate are a few examples of natural assets. Land is necessary for housing, infrastructural development, agricultural production, and conservation initiatives.

2.4.6 Physical assets

The infrastructure, tools, equipment, and technology that people have access to and employ in their daily lives are physical assets. Physical assets are necessary to support different economic activities and increase productivity in the framework of the SLF. In the perspective of sustainable livelihood, the notion of physical assets is central to a number of researches. In the context of rangeland management, (LaFlamme, 2011) cites landscape, biodiversity, flexibility, skill, information, and networks as essential assets. (Sandu, 2023) underscores the significance of physical asset management in attaining sustainable growth and a competitive edge. The significance of tangible assets, such as machinery and infrastructure, is emphasized by both (Chen, 2013)in relation to rural livelihoods and sustainable forest governance. When taken as a whole, these studies highlight the importance of physical assets within the framework of sustainable livelihood, especially when it comes to rural development and natural resource management.

2.4.7 Financial assets

Financial assets are resources, whether material or immaterial, that has a monetary value and it is collateral or a claim to future profits. Usually, these assets owned by organizations, companies, or private persons to support transactions, provide revenue, or offer financial stability. In the scope of sustainable livelihood, financial assets are essential, especially when it comes to environmental livelihood security (Biggs, 2015). Financial markets have a critical role in supplying the required money, which makes them indispensable for financing sustainable development goals (Ali, 2022). In support of sustainable development, the application of financial technology can further improve the management of financial issues, such as revenue and spending (Dyukova, 2021). In order to facilitate a sustainably prosperous future, the banking industry must change, prioritizing value creation above profit extraction (Jones, 2022).

2.5 Analytical tool used to measure household food security.

2.5.1 Household dietary diversity score (HDDS)

The variety of foods consumed in a home is measured by the Household Dietary Diversity Score (HDDS), which is a crucial indication of nutritional sufficiency and dietary quality (Odo, 2021). Food insecurity, household fuel consumption, socioeconomic level, and dietary diversity are some of the elements that influence it (Odo, 2021). The factors that determine how much food people with low incomes consume are many and intricately linked. These factors include household resources, accessibility, financial restrictions, health and biology, knowledge, attitudes, and socio-cultural influences (Gassara, 2021). The HDDS indicates how these variables may affect the variety and calibre of food consumed in a household.

When food categories based on nutritional function are added, it is very sensitive in detecting households experiencing food insecurity (Baliwati, 2015). Higher HDDS in Ethiopia is linked to higher consumption of foods derived from animals and is impacted by family size, literacy level, and socioeconomic class, among other things (Workicho, 2016). One instrument for measuring the variety of foods consumed at the family level is the family Dietary Diversity Score (HDDS).

2.5.2 Advantages and limitations of HDDS

The inability of the Household Dietary Diversity Score (HDDS) to measure the range of foods consumed by a household makes it a valuable tool for evaluating food security. According to (Sibrian, 2017), adjusting the score according to nutrient content and utilization coefficients can improve it even further. In particular, in industrial settings, (Baliwati, 2015)supports the HDDS as a technique for identifying food-poor households and suggests a change based on nutritional function. These studies demonstrate the benefits of utilizing HDDS to evaluate food security, especially its capacity to account for dietary variability and its potential for future improvement.

Furthermore, the Household Dietary Diversity Score (HDDS) is an important instrument for measuring food security since it captures both the quantity and quality components of food access (Leroy, 2015). When paired with additional variables like the Household Food Insecurity Access Scale (HFIAS) and the Coping Strategies Index (CSI), it gives a complete and more nuanced picture of food insecurity (Ike, 2017). This multidimensional technique is especially effective in

low- and lower-middle-income countries, where it is used with nationally representative data sets from household consumption and expenditure surveys (Russell, 2018).

However, (Vellema, 2016)discovered that the HDDS does not satisfy all of the requirements for accurate assessment of household food access. (Becquey, 2010) noted that, while the HDDS can approximate diet adequacy and offer information on food security, it may not be sufficient for household targeting and may fail to capture the complexities of food security. These studies collectively imply that while the HDDS can give some insights into food security, it should be utilized with caution and in combination.

2.6 Agricultural backyard enterprises and household income

Numerous studies have demonstrated how backyard agriculture businesses increase household income. According to (Acheampong, 2015) home gardens in Burkina Faso made a substantial financial contribution to rural households. In a similar vein, (Zeeshan, 2019)showed how non-farm businesses, including backyard gardens, raised farm revenue and consumption spending in rural India. (Taboka, 2016)Provided more evidence in support of these conclusions, demonstrating how backyard gardens increased household earnings and consumer expenditures in Botswana. (Meena, 2017)Emphasized the potential of backyard poultry farming to improve food and nutrition security, lessen vulnerability, and advance gender equity while focusing explicitly on the importance of this practice in bolstering rural livelihoods. When taken as a whole, these studies highlight the important role backyard farms play in enhancing household income and well-being.

2.7 Types of agricultural backyard enterprises

Small-scale agricultural operations carried out in homes or backyards are agricultural backyard enterprises. These businesses usually entail the smaller-scale manufacture of agricultural goods for local markets or personal use, as well as the growing of crops and rearing of livestock. Backyard agricultural businesses might involve pursuits like aquaculture, beekeeping, poultry husbandry, and vegetable gardening. These businesses give people and households the chance to produce agricultural products and earn extra money while making use of scarce resources and space.

2.7.1 Vegetable gardening

Backyard vegetable gardening refers to the practice of cultivating various types of vegetables in a small-scale setting, typically within the confines of one's own backyard. It involves growing vegetables for personal consumption, as well as potentially sharing or selling the surplus produce locally. Backyard vegetable gardening is an accessible and sustainable way for individuals to enhance their food security and engage in the production of fresh, nutritious food.

Backyard vegetable gardening contributes significantly to improving household livelihoods and food security in Southern Africa, especially in South Africa (Thomas, 2021). Backyard food gardening is impacted by a number of variables, including the size of the farmland, the land tenure structure, the residence's location, and the accessibility of training and support connected to agriculture(David, 2022).

2.7.2 Backyard poultry husbandry

Raising and caring to poultry in a household setting such as chickens Duck, Turkey Quail, Guinea Fowl or Pigeon is a type of backyard poultry husbandry. As more people look for direct access to organic meat, fresh eggs, and the health advantages of spending time with these animals, it is growing in popularity.

The pastime of raising chickens in backyards is a broad and developing industry with a variety of management techniques and opportunities for financial gain. According to (Houghton-Wallace, 2012), stress the value of good husbandry and veterinary care for backyard poultry. Backyard chickens have the potential to generate sustainable incomes, especially for women and tribal farmers (Ali, 2019).

2.7.3 Backyard beekeeping

The practice of keeping beehives in a household setting is backyard beekeeping. As more people become aware of how crucial bees are to pollination and honey production, its popularity has grown. Maintaining a beehive in your garden can benefit nearby ecosystems and be a fun and instructive experience. Pollination services and local food production are two advantages of

backyard beekeeping, which is becoming more and more popular in suburban and urban regions (Salkin, 2012).

2.8 Challenges faced by agricultural backyard enterprises

Agricultural backyard businesses confront a variety of difficulties, especially in small towns. For example, Indian rural youth, the main obstacles are financial limits, technological limitations, psychological hurdles and social and extension-related problems (Mubeena, 2021). According to (Yamaguchi, 2020), youthful rural entrepreneurs in Brazil see poor selling prices, a shortage of skilled labour and economic challenges as the main obstacles to investing in family farms. These results demonstrate the complexity of the problems encountered by backyard farmers and the demand for all-encompassing fixes.

2.8.1 Financial limits

Backyard agricultural businesses frequently encounter difficulties because of a lack of funding, restricted growth potential, distribution and marketing plans, working capital and cash flow, and unanticipated risks and occurrences (Ahuja, 2017). Investment in vital resources like infrastructure, crops, and fertilizers is hindered by a lack of funds. If a company wants to expand, it could need more land, labour and resources, which it might not have. During crucial times, operational costs and resource investments is impeded by inadequate working capital and cash flow (Muzekenyi, 2023).

2.8.2Limited space

A Significant obstacle to agricultural backyard businesses include restricted crop variety, lower potential output, difficulties scaling up, limitations on growing animals, storage and processing limitations, and zoning and regulatory restrictions all these came as a result of space limitations especially at the periphery of cities (Viskovic, 2011). These restrictions may restrict the amount and diversity of crops grown, make it more difficult to adopt large-scale agricultural techniques, and reduce the enterprise's potential for expansion.

2.8.3 Soil quality and contamination

For backyard farmers, soil quality and pollution present serious obstacles. Crop yields can be lowered and plant development impeded by infertile soil. Reduced water-holding capacity and increased nutrient discharge can result from soil erosion. Pollutant contamination, such as that caused by industrial chemicals, pesticides, herbicides, or heavy metals, can hinder plant development and reduce market potential (Tang, 2010). Insufficient availability of fertile land may restrict farming and raise expenses. Remediation may be expensive and time-consuming, requiring a large investment of capital as well as specialized knowledge. Furthermore, problems with contamination and soil quality might restrict crop choices, which lower the variety of goods and possible markets for backyard businesses. (Kibblewhite, 2018) noted that Soil quality and contamination pose significant challenges to agricultural backyard enterprises, particularly in urban and peri-urban areas. The emerging e-waste recycling industry in China has further exacerbated this issue, with high levels of inorganic and organic pollutants in agricultural soils near recycling workshops (Tang, 2010). These findings underscore the urgent need for effective mitigation strategies to protect soil quality and ensure the safety of food production in these areas.

2.8.4 Pest and disease management

For backyard agricultural businesses, managing pests and diseases is a major concern, especially in tropical climates due to lack of monitoring and early detection, the use of organic techniques and a lack of integrated pest management (IPM), backyard businesses have considerable difficulties in managing diseases and pests (Ratnadass, 2012). Although it has drawbacks, using plant variety in agro ecosystems can aid in the management of pests and diseases (Ratnadass, 2011). While integrated pest management (IPM) holds great potential, it requires a more comprehensive approach that takes the surrounding ecosystem into account (Coll, 2017).

2.9 Chapter Summary

The literature reviewed indicates that backyard farmers contribute significantly to increased household income and food security. Many studies demonstrate how backyard gardening increases food output and diversifies food sources, which benefits food accessibility and availability.

Additionally, backyard business owners show promise in raising nutritional quality and lowering susceptibility to outside food shocks. Furthermore, research indicates that backyard agricultural businesses have the ability to generate revenue and can aid in rural development and poverty reduction. Nevertheless, to realize the potential advantages, the literature also points out obstacles, including restricted access to resources, market limitations, and legislative impediments. The body of research generally lends validity to the concept that backyard agriculture may significantly increase household income and food security.

CHAPTER 3: METHODOLOGY

3.0 Introduction

The methodical strategy and procedures utilized in doing research is research methodology. It describes the whole approach, methods, and tools used to gather, examine, and evaluate data in order to find answers to research questions or validate hypotheses. The framework that researches methodology offers for the entire process guides researchers' attempts to yield reliable and valid results. In order to address research questions and accomplish study objectives, the researcher will organize, gather, and present data from Rimuka, Kadoma district, Zimbabwe. This chapter provides an overview of the research design, instruments, data collection strategies, research participants, and data analysis and presentation.

3.1 Research Design

Research design is a crucial aspect of any research, providing a systematic plan to study a scientific problem. It can be qualitative or quantitative, with the latter further divided into experimental and non-experimental designs (Indu, 2020). A mixed-method design is utilized in this research; the design will enable the researcher to collect both numerical data (e.g., Dietary Diversity Scores) and contextual information (e.g., Market Access and Availability, socioeconomic aspects). Integrating multiple methodologies can lead to a more complete understanding of the role of agricultural backyard enterprises on dietary diversity and household income.

3.2 Brief description of the study area

Rimuka is a high-density residential suburb located in the city of Kadoma, Zimbabwe. Kadoma is a city in the Mashonaland West Province of the country with a population of around 77,000 people, (Zim-States, 2012). Rimuka is one of the oldest and largest suburbs in Kadoma, characterized by

a mix of residential, commercial, and industrial areas. Rimuka is known for its dense population and diverse community. The suburb consists of various types of housing, including formal houses, semi-detached houses, and informal settlements. Closely built houses and narrow streets often characterize the residential area. The residents of Rimuka engage in various economic activities, including agriculture, informal trading, and small-scale manufacturing. The suburb also faces challenges common to high-density areas, such as limited access to basic services, inadequate infrastructure, and issues related to waste management and sanitation.

Figure 1RimukaKadoma map. SOURCE: ***Google Maps.***

3.3 Sampling

Sampling in research is the process of selecting a subset of the population for data collection (Turner, 2020). In this researcher, the researcher utilized purposive sampling to select the subset of a population, to make data collection more practical and cost effective.

3.3.1 Purposive sampling method

Purposive sampling, a non-probability sampling method, is particularly effective in ethno botanical research, where knowledgeable experts are needed (Indu, 2019).Purposive sampling allows researchers to focus on specific individuals or groups who possess the relevant knowledge and experiences related to the research objectives. It ensures the inclusion of participants who can

provide valuable insights into the role of agricultural backyard enterprises on dietary diversity and household income in Game Park Rimuka, Kadoma.

3.4 Sample size

Sample size is a critical aspect of research design, influencing the validity and clinical relevance of study findings (Burmeister, 2012). It is the number of participants or units needed to answer a research question (Noordzij, 2011).Calculating the sample size is crucial, as a small sample may not detect an effect, while a large one can be wasteful (Noordzij, 2011).The sample size was calculated using 95% confidence level, using the formula for estimating proportions:

n = (N * n0) / (N + n0 - 1) 3503

Where:

n = Sample size of the subgroup

N = Total population size

n0 = Sample size for the entire population

Name of location	**Number of households**	**Sample size**	**Percentage**
Mbada	30	**28**	**29%**
Tsoko	27	**22**	**23%**
Shumba	25	**21**	**22%**
Nzou	31	**25**	**26%**
Totals	**113**	**96**	**100%**

Table 1Sample size

3.5 Data collection Methods

3.5.1 Questionnaires

Questionnaire is a structured tool used to gather information from a group of individuals, often referred to as respondents (Roopa, 2012).The design of a questionnaire is crucial, with key steps including defining the required information, identifying the survey type and question types, writing questions, and pre-testing the questionnaire (Taherdoost, 2022).The questionnaire was chosen because of its multiple advantages, which will be discussed further below, which supports why the researcher chose it as a data collection tool.

Advantages of questionnaires

The questionnaires are capable of addressing a variety of problems and analyses of concern, with a high possibility of a high response rate. The questionnaires were distributed to various staff around the council, with several questions that needed to be answered. Questionnaires allow respondents to ponder their replies thoroughly without interruption since the researcher will simply leave the workers to fill out the questionnaires and return to collect them when they are finished. They are cheap, and they will almost certainly make surveys available to a large number of individuals at the same time. There is consistency. Each respondent was asked the same set of questions. The questionnaires for all respondents were all the same and asked the same questions, promoting consistency in data collection.

Disadvantages

There is no way to know how honest a response is since any council employee might write whatever they wanted, which may distort the facts that the research sought. The target demographic may become hesitant to answer questions and commonly 'doesn't have time' to complete the questionnaire. Individuals may understand each question differently and hence respond based on their own perception of the question. Some residents lacked the necessary skills to complete the questionnaire.

3.5.2 Interviews

According to (Hussey, 2015),an interview is a data collection approach in which selected participants are given questions to learn what they do, think, or feel about a certain topic. The research will use unstructured interviews or open-ended questions to allow the interviewee to give their own responses in the manner of his or her choice, and they will allow respondents to have control over their responses, ensuring that respondents will give their own answers rather than agreeing to the structured interview answers.

3.6 Ethical Considerations

Research ethics is a complex and multifaceted concept, encompassing both individual and collective responsibilities. (Comstock, 2013), emphasizes the importance of philosophical decision-making in research, highlighting the role of egoism and moral rights. (Resnik, 2011), defines ethics as norms for conduct, distinguishing between acceptable and unacceptable behaviour. The following research values were prioritized in this study: recognizing members' right to secrecy; voluntary involvement; avoiding damage to participants; privacy and confidentiality; equity and fairness, informed approval; and achieving entrance. As a result, before beginning this investigation, the researcher obtained permission and consent from all the respondents from Game Park suburb in Rimuka, Kadoma.

3.7 Data Analysis and analytical frameworks

Data analysis encompasses a range of mathematical and graphical operations, including data collection, organization, reduction, and computational processing (Badiru, 2020).It is crucial for query processing, producing data summary information, and enabling semantic query optimization (Robinsons, 2020).

3.7.1 Frequency analysis

Frequency analysis analysed data from objective one (to identify the types of agricultural backyard enterprises in Gamepark, Rimuka Kadoma. Frequency analysis is a statistical technique used to determine the frequency and distribution of different values or categories within a dataset. A descriptive analysis method provides a summary of how often each value or category occurs in the

data. The analysis results presentation made use of tables and bar graphs. This analysis helps in understanding the distribution and patterns of a variable or set of variables (Zheng, 2017). Gross margin analysis evaluated the cost and profitability associated with these agricultural backyard enterprises.

3.7.1.2 Gross margin analysis

Gross margin analysis evaluated agricultural enterprises production in Rimuka, Gamepark as well provide information about profitability. According to (Makombe, 2021)gross margin is a simple model that is used to measure the financial performance of an enterprise and also used in comparing performance of different projects that have similar input requirements. Gross margin is a useful tool used for planning, budgeting, farm management and estimating returns of broiler production. This analytic framework is one of the common methods to determine profitability through estimating profit of a firm. From each enterprise, l selected one enterprise to perform gross margin analysis. This is because of enterprise limited data as some respondents did not fill information about production costs and profits random to perform gross margin analysis on it.

Formula for calculating Gross Margin expressed as follows

Gross margin $=Ps \times Q-\sum PqXq$

P is a unit price of single quantity for example 1 mango.

Q is the quantity sold

$\sum PqXq$ is the total variable cost (TVC)

TVC includes for example in broiler production, cost of buying day old chicks, feed, vaccines, medical, labour, marketing and cost of fuel. If the gross margin is negative, it indicates that the enterprise is not generating any profit rather the project is not viable. If it is positive, it shows that the broiler production is profitable and viable.

3.7.2 Poisson regression analysis

Poisson regression analysis assessed the contribution of agricultural backyard enterprises to household food security. Poisson regression is a type of regression analysis used to model count data, where the dependent variable is a count of the number of occurrences of an event. It is particularly useful when the dependent variable follows a Poisson distribution, which is a discrete probability distribution that expresses the probability of a given number of events occurring in a fixed interval of time or space, given the average number of events that occur in that interval. In this case household dietary diversity score was the count variable used. Household Dietary Diversity (HDD) is a measure of household food security that provides information about a household's access to a variety of foods. It is a widely used indicator in food security assessments and nutrition studies.

The Household Dietary Diversity Score (HDDS) is calculated by summing the number of unique food groups consumed by a household over a given reference period, typically the previous 24 hours or 7 days and in this study 7 days was the reference time. The basic concept behind HDD is that a greater variety of foods consumed is generally associated with better nutrient adequacy of the diet. A more diverse diet is more likely to provide adequate essential nutrients. Seven food groups used in this study and they include roots and tubers, vegetables, fruits, meat, eggs, legumes and milk. For each food group, which was consumed by the household during the reference period (7 days), a point was assigned. The maximum possible score is seven, indicating that the household consumed foods from all seven food groups. A higher HDDS indicates a more diverse diet and is generally associated with better micronutrient intake and improved food security. The HDDS compares dietary diversity across different households, communities, or times.

By using Poisson regression, the researcher was able to model the relationship between the independent variables and the HDDS, which represents the count or number of different food groups consumed by the household. The regression coefficients will indicate the expected change in the HDDS for a one-unit change in the corresponding independent variable, while holding all other variables constant. The results provide insights into the factors that influence household food security and the potential role of backyard food production in improving food security.

Poisson regression model denotes as follows:

$$\text{Log } (y)=\beta 0+\beta 1\times 1+\beta 2\times 2+\beta 3\times 3+\beta 4\times 4+\beta 5\times 5+\beta 6\times 6+\ldots+\beta k*xk$$

y=dietary diversity score which is the dependent variable.

β0= intercept

X represents independent explanatory variables

β1, β2…. βk=independent variable and these are vegetables, poultry, fruit orchard, dried grains, dogbreeding, household size, household income, level of education.

3.7.3 Multiple linear regression analysis

Multiple linear regression analysis analysed the contribution of agricultural backyard enterprises on household income in Gamepark Rimuka. The framework is the best model to determine the relationship between variables. It is useful in determining relationships between two or more independent variables for example enterprise income, level of education, income and marital status.

Multiple linear regression models denote as follows:

$Yi=\beta0+\beta1X1+\beta2X2+\beta3X3+\beta4X4+\beta5X5+\beta6X6\times E$

Yi represents household income, which is the dependent variable

β0 represents the constraint of the equation, which is household income

β1 represents depicts coefficient of variables

X represents independent explanatory variables

β2: backyard incomes

β3: level of education

β4: age

β5: household size

β6: food expenses

3.7.4 SWOT Analysis

Objectives 3, "challenges faced by agricultural backyard enterprises" SWOT analysis was used. SWOT analysis identified and analysed constraints and opportunities in doing agricultural backyard enterprises. SWOT analysis assessed the internal strengths and weaknesses, as well as external opportunities and threats that influence an enterprise performance. Strengths are internal positive factors that are advantageous to the enterprise for example skilled labour, availability of capital and availability of water. Weaknesses are internal negative factors that may hinder enterprise performance of agricultural backyard enterprises for example, shortage of land, shortage of water and lack of knowledge. Opportunities are external factors that could be leveraged by agricultural backyard enterprises improve their production for example, increase in agricultural produce prices, increase in demand and free inputs. Threats refer to external factors that could pose risks to agricultural backyard enterprises for example droughts, pests and diseases and inflation.

Therefore, combining SWOT Analysis, the farm can gain knowledge on the factors that influence enterprise production. This can help the farm to identify areas for improvement for instance exploring new market opportunities and growing drought tolerance crop varieties.

SPSS and Excel were tools used to analyse data in this research.

Chapter Summary

This chapter emphasises the researcher's research methods in conducting her study. The researcher employed the study design. Respondents were chosen using a purposive sampling. The major methods of data collection were questionnaires and interviews. Procedures for data gathering and ethical considerations, the chapter also emphasised the value of research techniques, specifically data gathering methods, in ensuring the validity and trustworthiness of the study. The next chapter discusses data presentation, analysis, and conclusions.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

4.0 Introduction

The data gathered from the study and its analysis is presented in this chapter. Mixed-method design highlights patterns and trends in the data, and an analysis of the implications of the results was conducted with a primary focus on tying the data to the study's goals. The results obtained from the various instruments utilized in this investigation are presented in the first section. The findings are analysed and their implications are discussed in the second section**.**

4.1 Questionnaire response rate

Table 2 Respondent rate and percentage

Division/ Location	Headcount – Target Group(s)	Target Sample (n)	Actual Sample (n)	Actual Sample (%)
Kadoma, Gamepark	113	96	82	82%

The researcher facilitated the interviews and administration of questionnaires with the assistance of other school colleagues. Facilitation of the two based on availability and in cognizance that this was to have minimal effects on residents 'normal day to day errands. Data were collected from 5-9April 2024. The duration of each interview was about 5 minutes and questionnaires took just about 10 minutes to complete. Both completed at convenient times to the research subjects. This was mostly to ensure each participant had a reasonable opportunity for participating in the research.

4.1.2Demographic Structure of Respondents

Out of the total of 96 questionnaires distributed to the male and females, the response rate for females 90% and that for male's was76% and the overall response rate was 85%. Table 2 below shows the overall response rate for both management and non-management employees.

Category	**Questionnaires**	**Responses**	**Response Rate**
Females	62	56	90%
Males	34	26	76%
Overall	96	82	85%

Table 3 Demographic structure of respondents

The researcher made concerted efforts to follow up the outstanding questionnaires but to no avail

and had to contend with what was at hand to interpret the data and draw meanings from the data.

4.1.3 Gender of participants

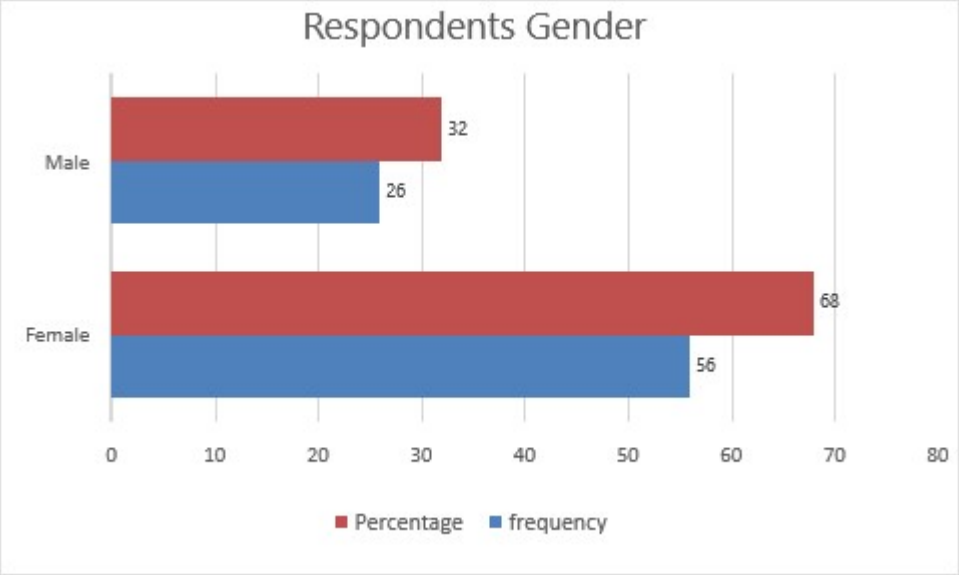

Figure 2 Gender of participants

4.1.4Age range of participants

The height of each bar represents the percentage of respondents, either male or female, who provided a particular response to each question.

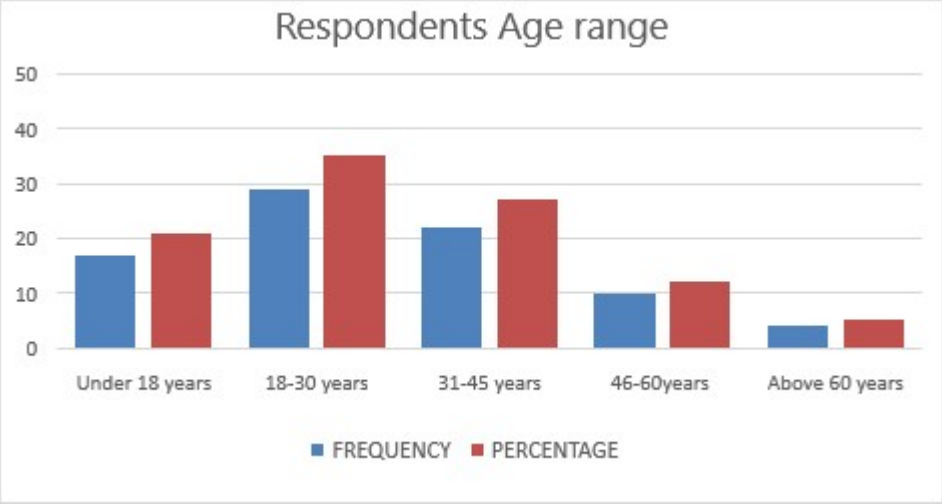

Figure 3 Age of participants

The graph divided into three sections, each reflecting a specific age range. These sections are designated "Under 18 years,""18-35 years," and "Above 50 years," denoting the age ranges being studied. The inclusion of unambiguous labels facilitates understanding of the age groups depicted

4.1.5Education level of participants

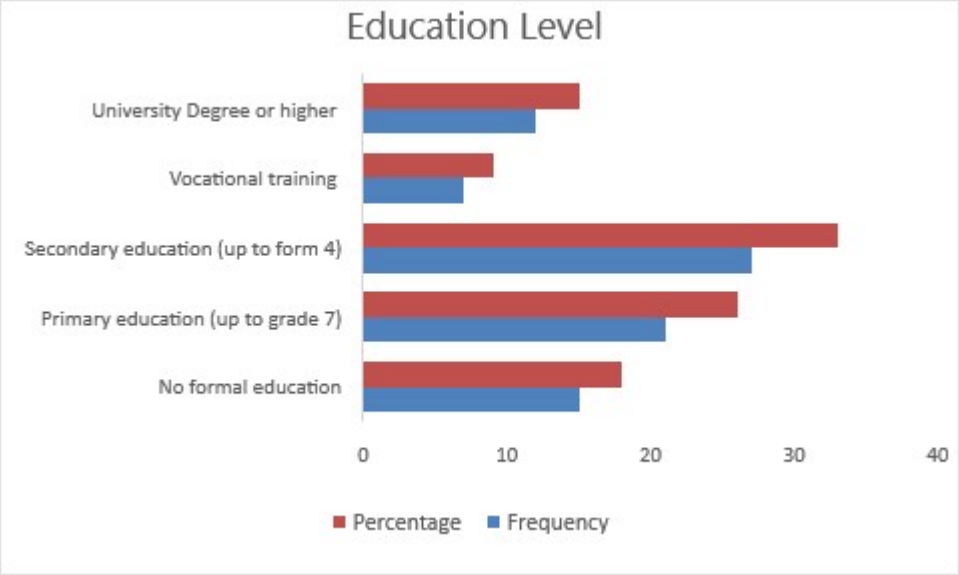

Figure 4 Education levels of participants

The graph depicts the educational disparity between respondents. It provides for a fast comparison of educational attainment levels, showing any discrepancies or similarities across groups.

4.2 Types of agricultural backyard enterprises in Rimuka Gamepark, Kadoma and the cost and profitability assorciated with them.

Frequency data analysis helps in analysing the distribution of data and occurances of different values or categories whithin a dataset, a table and bar graph was used to show the types of backyard enterprises in Gamepark Rimuka, Kadoma.

Table 4 Frequency of enterprises

Enterprise	FREQUENCY	Percentage	Rank
Vegetable gardening	**33**	40	1
Poultry farming	**21**	26	2
Rabbit	**6**	7	5
Dried grains	**2**	2	6
Fruit Orchards	**8**	10	4
Dog Breeding	**12**	15	3

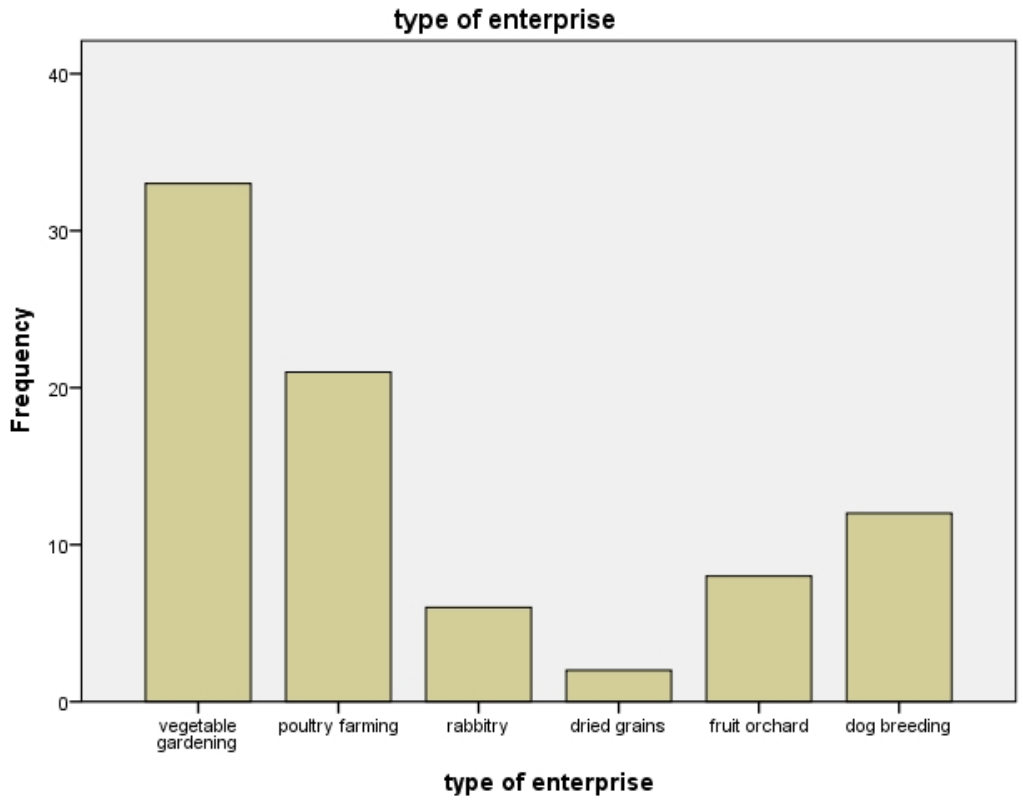

Figure 5 Frequency of agricultural enterprises

4.2.1 Vegetable Gardening

Forty percentages of the respondents noted that they were into vegetable gardening enterprise. A vegetable gardening in a backyard can be a profitable and sustainable enterprise. Some popular crops include tomatoes, covo vegetables, tsunga, lettuce and herbs. One of the successful vegetable farmers highlighted that.

"Tomatoes require full sun and support for their vines, while cucumbers can be grown vertically or on the ground. Lettuce is a cool-season crop that needs consistent moisture, and peppers thrive in sunny locations. Strawberries are perennial fruits that prefer well-drained soil and regular watering. Growing herbs like basil, mint, and rosemary can also be profitable. Factors like soil preparation, pest management, watering, and harvesting techniques are crucial for success."

4.2.2Poultry farming

Twenty-one percent of the respondents reported that they were into poultry farming, the researcher divided the poultry business into 3 segments namely broiler, layers and roadrunner business. The respondents fill their respective segment.

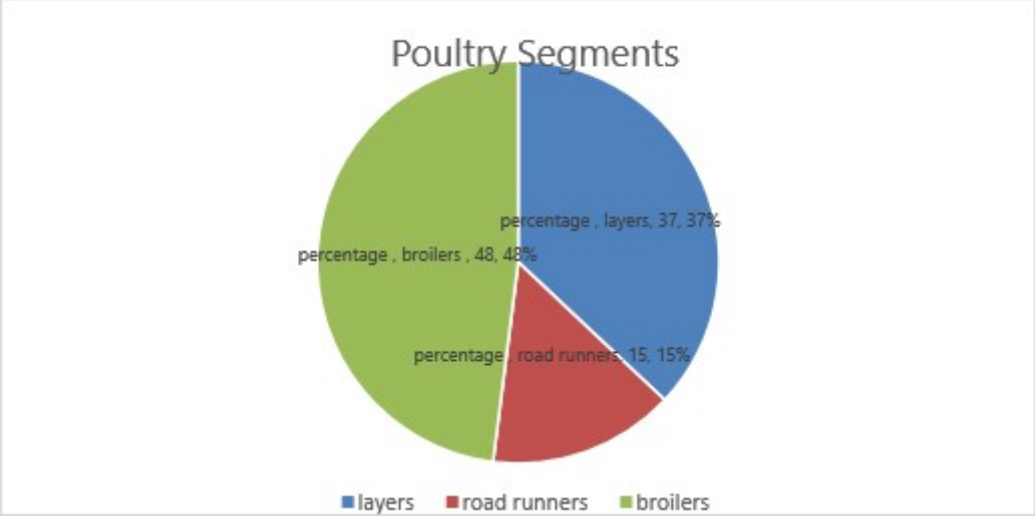

Figure 6 Poultry farming

The majority of the respondents they were into Broiler farming business constituting 48% followed by the layer's business 37% (8/21 of the total respondents in the poultry business). Only three respondents in this research were into roadrunner farming. Layers are chickens specifically bred

for egg production. They have the ability to lay a large number of eggs throughout their productive life. In this research, eight out 21 poultry farmers were into layers farming and one of the famers concluded that:

"I decided to start layer farming due to the continual demand for eggs in our local market. Eggs are a staple food item, and demand is consistent throughout the year. This steadiness offers me with a consistent market and cash stream. Layer farming also appealed to me because of the long-term returns it provides. While broilers have a shorter production cycle, layers begin laying eggs after a few months and continue to do so for a long time. This implies I can earn more money from egg sales over time, resulting in a more sustainable business model."

4.2.3 Rabbit

Seven percent of the respondents noted that they were into rabbit meat production. Rabbits are for meat production due to their high reproductive rate and efficient feed conversion. They have a short reproduction cycle, with a gestation period of about 31 days noted one of the respondents. Rabbits raised for their meat, which is lean, low in cholesterol, and considered a healthy protein source. Proper housing, feeding and management practices are essential for meat production.

4.2.4 Dog breeding

Fifteen percent of respondents reported that they were doing dog breeding as a backyard enterprise, which involves selecting healthy, genetically sound dogs with desirable traits. One of the successful breeders said that.

"It is important to research different breeds, understand their specific needs and characteristics, and choose breeding pairs that complement each other in terms of temperament, health, and conformation. Breeders should prioritize the overall well-being of the dogs and aim to improve the breed with each generation. Prioritize the health of the breeding dogs by conducting appropriate health tests to screen for genetic disorders or inheritable diseases that are common in the breed."

4.2.5 Dried grains/Vegetable business

Two percent of respondents (2 out of 82 participants) reported that they were into selling of dried grain business. Drying is a crucial step in the processing chain, reducing moisture content to ensure long-term storage stability. They buy grains such as maize from nearby farms in large quantities and then resell at a higher price.

"Packaging and branding were essential for preserving the quality and integrity of the products. Good storage facility or sacks were also necessary to ensure the grains meet desired standards, including moisture content, cleanliness, size, and overall product quality."

4.2.6 Gross margin analysis for agricultural backyard enterprises in Gamepark Rimuka.

4.2.6: Gross margin for broiler production.

ITEMS	UNITS	QUANTITY	PRICE PER	TOTAL
Day old	Birds	200	$0.90	$180
Starter	50kg	2	$34	$68
Grower	50kg	2	$32	$64
Finisher	50kg	4	$36	$144
Stress pack	1kg	2	$4	$8
Labour Cost	42days	1	$1 per day	$42
Electricity	$			$3
Bedding cost	50kg	15	$1	$15
Total variables costs				$524
Gross income/live birds		190	$7	$1,330
Return per $ invested				$2.50
Gross margin				$806
Mortality	Birds	10		5%

Table 5 Gross margin analysis for broiler production

As shown by the table above, positive gross margin indicates that the broiler production is profitable. The enterprise is able to cover its total cost and achieve profits from broiler sales. The profitability highlighted by gross margin ratio, which is $ 2.50 for every $1 invested in broiler production. The initial placement of broilers was 200 birds but 190 birds sold at the end of the production cycle, mortality rate accounted for and it was at 5% (10 birds). Raising broilers in a backyard setting is more profitable because it requires minimal infrastructure compared to commercial operations for example from the survey some were doing broiler production in unused rooms of their houses hence low start- up cost . Broiler production is also a quick turnaround

business. They reach market weight in 6-8 weeks, allowing for multiple production cycles per year. This fast growth and short production period enables quicker returns on investment.

4.2.7: Gross margin for layers.

Table 6 Gross margin for layers

Number of birds	Layers	50	$10 at point of lay	$500
Feed	50kg	100	$18	$1,800
Transport	$			$100
Utilities				
Point of lay	12 months			
Total variable costs				$2,400
Eggs produced/12 months		14600	$5 each crate/30 eggs	$2,433
Layers sold after egg production cycle		40	$5 each crate/30 eggs	$200
Total gross income				$2,633
Return per $ invested				$1
Gross margin				$233

As shown above layers have a positive gross margin meaning it is a viable business and the return per each dollar invested is $1. The assumption is that 80% of the layers will produce eggs hence the figures above. Layers are very proactive and can produce for 12-18 months with each layer producing one egg per day. The business is more viable because eggs are high-value agricultural product, with consistent demand from consumers and industrial users for example one of the layer producers noted that he secured a market at Kadoma OK Supermarket were they use eggs for baking. However, layers reach peak production, where the less eggs are produced, it takes time for the operation to reach full revenue potential, and there 20% probability that some layers might not produce eggs is accounted for in the gross margin analysi4.2.8 Gross margin for rabbits.

Table 7 Gross margin for rabbits

ITEMS	UNITS	QUANTITY	PRICE PER UNIT	TOTAL BALANCE

Rabbits	8 does and 1 buck		9	$8.00	$72
Feed	vegetables			$	$200
	Hay	60kg		$1/bag	$60
Labour		1		$20/month	$240
Others					$30
Total variable costs					$602
Breeding	6 cycles in a year	6 rabbits /cycle for each doe		$5 each rabbit	$1350(Gross income)
Return per dollar invested					$2.20
Gross margin					$748.00

Rabbit production is very profitable with positive gross margin and return per dollar invested is $ 4 after accounting for 6% mortality and changes in breeding patterns, hence instead of having 288 rabbits annually we now have 270 to sell. Profitability realized because of low space requirements. Rabbits can be raised in small cages, requiring less land and housing space compared to other livestock like pigs and this reduces capital invested needed to set up a rabbit operation. Rabbits can feed on a variety of low cost feed sources including grasses, vegetable scraps and even agricultural by products for example one of the rabbit backyard entrepreneurs grow a covo vegetable garden to feed rabbits and flexibility in feed sourcing helps control ongoing feed costs. They also have a short gestation period of 30 days and can breed year round with litter size of 5-8.

4.2.9 Gross margin for vegetables.

ITEMS	UNITS	QUANTITY	PRICES PER UNIT	TOTAL BALANCE
Vegetable seedlings(rape)	Seedlings	300 plants	$0.10	$30
Manure	50kg	4	$4	$16
Pesticides	$			$3
Labour	$			$25
Packaging	$			$5
Other	$			$12
Bundles sold per month(growing &harvesting cycle)	Bundles	700	$0.50	$350
Total variable costs				$91
Return per $ invested				$3.85
Gross margin				$259

Table 8 Gross margin for vegetable production

As shown above rape vegetables are showing positive gross margin and return per dollar is $3.85. Rape was said by respondents that it is fast growing, high-yielding vegetable crop that can produce multiple harvest per growing and harvesting cycle of 1 month from the same planting. This allows growers to maximize the productivity and revenue potential of their limited land area. The vegetables is a low input cost enterprise and some of the respondents noted that they do purely organic vegetable garden were they use manure from broiler bedding (very cheap).

4.2.10 Gross margin for dried grains.

ITEM	UNITS	QUANTITY	PRICE PER UNIT	TOTAL BALANCE
Dried grains	Maize	1 tone	$0.32 per kg	$320
Labour	$			$50
Packaging				$5
Total variable cost				$375
Gross income/$0.60 per Kg				$600
Return per dollar invested				$1.60
Gross margin				$225

Table 9 Gross margin for dried grains

The gross margin for dried grains is showing profitability with a positive gross margin and return per dollar invested is $1.60. Dried maize is profitable because it is the staple for food hence easy to sell and it has long shell life.

4.2.11: Gross margin for dog breeding.

ITEMS	UNITS	QUANTITY	PRICE PER UNIT	TOTAL BALANCE
Litter size of Rottweiler		6 puppies on average	$250.00	1500(Gross income)
Weaning age to sell	6 weeks			
Feed				$200
Labour				$30
Others				$35
Veterinary care				$100
Total variable costs				$365
Return per$ invested				$4
Gross margin				$1,135.00

Table 10 Gross margin for dog breeding

Dog breeding enterprise has a positive gross margin meaning it is viable and return per $1 invested is $ 4. Purebred Rottweiler puppies often command high prices and ranges from $250-$450 per puppy depending with the market. Respondents noted that the market for dogs is niche and extends to places like Harare; examples of their markets are private security companies and local gold dealers. The variable costs for dog breeding are relatively low compared to the high puppy sale prices.

4.2.12: Gross margin for mango fruit orchard.

ITEMS	UNITS	QUANTITY	PRICE PER UNIT	TOTAL BALANCE
Mango orchard	3 trees		$0.10 each	
Pesticides				$20
Others and labour				$45
Total variable cost				$65
Gross income/2000 mangos				$200
Return per dollar invested				$3
Gross margin				$135

Table 11 Goss margin for fruit orchard

Fruit orchard is a low input costs enterprise with high revenue. The return per $1 invested is $3, the gross margin is positive due extended harvest season (3-5 months), and this helps maximize revenue. Mango fruit orchard entrepreneurs noted that mango trees were already established when Gamepark location was formulated and those allocated to stands with mango tress benefited (no establishment cost required).

4.2.12: Agricultural backyard enterprise profitability and ranking.

ENTERPRISE	RETURN PER $1 INVESTED	RANK
Dog breeding	$4	1
Vegetables	$3.85	2
Fruit orchard	$3	3
Poultry	$2.50	4
Rabbit	$2.00	5
Dried grains	$1.60	6

Table 12 Enterprise profitability ranking

As shown above dog, breeding is the most profitable enterprise with return per $1 of four. The market for dogs is niche and very demanding. The second profitable is vegetables with return per $1 invested of $3.85and the third profitable is fruit orchard return per dollar of $3. One of the respondent noted that dog-breedingbusiness is more profitable because of low input cost and high demand in Kadoma and the market extends to places like Gweru and Kwekwe. Demand is high because most people use dogs as valuable pets and for security reasons.

4.3 Agricultural Backyard Enterprises and Food Security

Parameter Estimates

Parameter	**Std Error**	**B**	**Chi-square**	Sig	**Exp(B)**
(Intercept)	.3984	-.248	.386	.534	.781
Poultry	.1476	.418	8.008	.005**	1.518
Vegetables	.1525	.422	7.650	.006**	1.531
Fruit orchard	.1426	.371	6.769	.009**	1.449
Dried Grains	.2446	**.**373	2.322	.128	1.452
Dog breeding	.1427	.346	5.867	.015**	1.413
Rabbit	.1579	.406	6.597	.010**	1.500
Household size	.0487	.017	.128	.720	1.018
Levelof education	.1429	**.**032	.049	.825	1.032
Household income	.0004	-6.741E-005	.036	.849	1.000

Table 13 Poisson parameter estimates

Indicates 5% statistical significance level at 5% (P< 0.05). **SOURCE: Survey Data

The equation below is set to address objective two of the study where y dependent represents HDDS;

Log(y) =β0+0.418poultry+0.422vegetables+0.371fruit orchard+0.346dog breeding+0.406rabbit+0.017household size+0.032level of education-6.741-005E household income**.**

4.3.2 Estimation of significant variables

Poultry production has a positive constant with a significant value of .005, which was as expected by the researcher. This lies in the same direction as from the study done by (Ali, 2019), in which backyard chickens, have potential to improve household food security and generate sustainable income, especially for women and tribal farmers. The Exp (B) of 1.518 means for every unit increase in poultry variable, the expected count of the HDDS increases by a factor of 1.518 or 52% holding other variables constant. Households with poultry can directly consume eggs and meat, which contributes to the diversity of their diet. Selling poultry products, such as eggs and live birds can provide households with additional income and this income is used to purchase a wider variety of food items, increasing the overall dietary diversity. Briefly, households with a higher level of poultry-related agricultural backyard enterprises are more likely to have a higher diversity, which is an important indicator of household food security.

Vegetable gardening is another variable that is statistically at the value of .006 and a constant of .422. This again lies in the same direction from a study done by (Lawrence, 2022), in which backyard gardening improve food security in a variety of regions. As shown by the results, for every increase in vegetable variable, the expected count of the HDDS increases by a factor of 1.525 or 53%. Households with vegetable gardens can directly consume a variety of fresh vegetables such as covo, tsunga, tomatoes, onions and lettuce and this contributes to the diversity of their diet.

Fruit orchard is significant at the level of .009 and it has a positive relationship with the dependent variable. For every unit increase in the fruit orchard variable, the expected count of the HDDS increases by a factor of 1.449% or 45% holding other variables constant. Fruit orchard based agricultural backyard enterprises can serve as a household asset that is be drawn upon during times of need, providing a buffer against food insecurity and allowing for the purchase of diverse food items from money generated from selling fruits. Households with fruit orchards directly consume a variety of fresh fruits such as mangoes, oranges and papaya.

Dog breeding is significant at the level of 1.6% and for every increase in dog breeding variable, the expected increase of HDDS is by a factor of 1.413 or 41.3%, holding all other variables constant. Dog breeding is one of the most paying agricultural backyard enterprise and households generate a lot of income from it. These incomes purchases a diverse of food contributing to the household food security.

Rabbit business is significant at the level of 0.1% and for every unit increase in the rabbit variable, the expected count of the HDDS increases by a factor of 1.500% or 50%. Households can directly consume rabbit meat, which contributes to the diversity of their diet. Household income is also increased by selling rabbit meat or live animals.

According to the results, dried grains are contributing HDDS but the relationship is not statistically significant. This might be due to differences in household priorities and preferences. Households may prioritize the production or acquisition of other agricultural products such as fruits, vegetables and livestock they perceive as more important for improving dietary diversity and food security.

Household size is contributing little to food security and the relationship is not statistically. This is because larger households may have more dependents requiring food but fewer income earners. In the survey, most of the households composed with high dependent age groups and few independent income earners.

4.3.3 Omnibus test

Omnibus test

Likelihood Ratio Chi-square	Sig.
35.533	**.000**

Table 14 Omnibus test

The omnibus test above show that the full model, with all the independent variables related to agricultural enterprises fits the data significantly. This model is statistically significant at level of 5% (.000). The agricultural backyard enterprises contribute significantly to the explanation of the variability in the HDDS.

4.3.4 Goodness to fit

The goodness of fit in regression analysis refers to the extent to which the regression model accurately describes of fits the observed data.

	Value	Df	Value/df
Scaled deviance	3.450	72	.048
Scaled Pearson Chi-square	2.581	72	0.36

Table 15 Goodness to fit

From the results above the deviance value of 0.48, suggest that the deviance is less than 1, which is a good indication that the model fits data well. The Pearson chi-square value/df of 0.36 is also less than 1, indicating that the model is fitting the data well.

4.4 Contribution of agricultural backyard enterprises to household income.

4.4.1 Variable test of significance

Coefficients

Model	B	Std Error	Beta(standardized coefficient)	Sig.
(Constant)	34.702	110.993		.755
Household size	10.013	9.920	.066	.316
Backyard incomes	2.056	.165	.810	.000***
Food expenses	.028	.064	.028	.664
Level of education	4.914	19.973	.018	.806
Age	-.723	1.818	-.029	.692

Table 16 Regression Parameter Estimates

Indicates 5% statistical significance level at 5% (P< 0.05): **SOURCE: Survey Data

Reading from the results the equation of the model is as follows whereby dependent Yi represents household income;

Yi=β^0+10.013 household size+2.056 backyard income+0.038 food expences+4.419 level of education-.723 age.

The left hand side of the equation represents dependent variable in the equation and the right hand side represents independent variable. The values on the right hand side on each variable are the coefficients of the variables, whilst the signs before the coefficients reflect the relationship between the independent variable and dependent variable. Although some relationships are statistically significant, all independent variables are showing positive relationship with the dependent variable.

From the results above backyard income is a significant positive predictor of household income (β= 2.056, p = .000 indicating 5% level of significance). This indicates that one unit increase income is associated with a 2.056 unit increase in household income when holding other variables constant. Backyard agricultural activities such as poultry and dogbreeding can provide households with additional income beyond primary employment. In addition, households that engage in agricultural backyard are able to reduce their expenses on certain food items by producing them at home for example meat from broiler. This can lead to cost saving that effectively increases the household's disposable income and overall financial well-being.

Other variables are showing a positive relationship with the independent variables but are not statistically significant and age is showing negative relationship. The type of education or skills required for successful backyard agricultural enterprises may not be directly correlated with the formal education levels of the household members. Practical, hands-on experience and knowledge about farming, livestock rearing or gardening may be more relevant than academic qualifications in determining the success and income contribution of these activities.

As people age, they may experience physical limitations or declining health, which can affect their ability to engage in the more physical demanding tasks associated with backyard agricultural activities.

4.4.2 Model Summary

Model summary provides a comprehensive overview of the statistical properties and performance of the regression model.

Model summary

Model	R	R Square	Adjusted R square	Sig. F Change	Durbin-Watson
1	.833[a]	.694	.673	.000	1.730

Table 17 Regression model summary

The results above shows that the model can determine results at 83% from the coefficient of R=0.833.This indicates a good level of prediction and strong relationship between household income and independent variables. The coefficients of determination, R2 0.673=70% and adjusted

R2=67% represents a moderately strong model. This means that the independent variables in the model explain 67% variance in the dependent variable after adjusting for the number of independent variables.

4.4.4 ANOVA

ANOVAis a statistical technique used in linear regression analysis to assess the significance of the overall model and individual predictors. It also provides information about the relative importance of each independent variable in regression model.

Model	Sum of Squares	Df	Mean squares	F	Sig.
Regression	**2667705.093**	**5**	**533541.018**	**34.394**	**.000[b]**
Residual	**1178943.688**	**76**	**15512417**		
Total	**3846648.780**	**81**			

Table 18 ANOVA

The p-value .000 indicate statistical significant of the regression model ($p \leq 0.005$) and explains a significant proportion of the variations in the outcome variable. The F value of 21.770 suggests that there is a significant relationship between the independent variables in the regression model and the dependent variable. The model is able to explain a significant amount of variation in the dependent variable.

The extremely low significance level of .000 further strengthens this interpretation. It indicates that the likelihood of obtaining the observed F value purely by chance is very low. Overall, these results provide evidence that the regression model is statistically significant and that it provides a meaningful explanation for the variation in the dependent variable.

4.5 SWOT analysis agricultural backyard enterprises.

SWOT analysis provides a structured framework to analyze agricultural backyard enterprises internal strengths and weaknesses as well as external opportunities and threats. This view helps identify the key factors influencing the organization performance.

Table 19 SWOT analysis

STREGNTH	WEAKNESS
▪ High-quality organic produce ▪ Direct control over production processes ▪ Close proximity to target market	▪ Limited land space for expansion ▪ Lack of specialized farming equipment ▪ Seasonal production limitations
OPPORTUNITIES	**THREATS**
1) Growing demand for locally sourced food 2) Increasing interest in organic farming 3) Collaboration with local restaurants and markets	▪ Competition from larger-scale farms ▪ Fluctuating market prices ▪ Regulatory challenges

This SWOT analysis looks at the problems that an agricultural backyard enterprise faces. The goal is to identify internal strengths and weaknesses, as well as external opportunities and risks to the company's development.

4.5.1 Strengths

The research highlights that agricultural backyard enterprise has various advantages. It generates high-quality organic produce, which is a competitive advantage in the market for example vegetables such as rape, covo, carrots and Pease are sold at Musikawevarimi in Rimuka. A study by (Ovharhe, 2020) also indicated that backyard agriculture ensures the provision of a variety of organic produce such as fruits and vegetables. Agricultural backyard entrepreneurs have direct control over its production operations; they decide what to sell andamount to use for personal consumption. Furthermore, its proximity to the target market such as Machipisa, Musikawevarimi,

Gameparksuburbsand Rumwe enables efficient delivery and timely reaction to client demands and at the same time reduce transport cost. Most of the broiler and rabbit producers noted that they sell their produce to Machipisa shopping centre where there are many butcheries and canteens.

4.5.2 Weakness:

The research highlights that there are several vulnerabilities in the business. Limited land space presents obstacles for expanding and scaling up activities. Stand in Rimuka Gamepark ranges from 350-400m^2 and after building houses most backyard only have 50-150m^2 according to the research study. The municipal policy and planning through land distribution affects urban farming in Vancouver, Canada (Valley, 2019). Vegetable gardening requires more land for it to be more profitable and viable because different types of vegetables require specific plant spacing for plants to grow in a productive manner for example onion spacing when standard bulbs are required is 30-45cm between rows, for onions to be grown more space is required. A lack of specialized farming equipment may reduce productivity and efficiency for example drip irrigation for sustainable agriculture. Seasonal production constraints limit the year-round availability of certain crops for example maize is more productive starting October-February and supply of dried maize is scarce in some seasons.

4.5.3 Opportunities

According to the study, there are numerous options for the agricultural backyard business. The increased demand for locally sourced food creates an opportunity to increase market share for example eggs are soldat local supermarkets such as Zapalala and Harare Pfacha. The growing interest in organic farming complements the enterprise's capabilities are used to attract new clients for example demand for rabbits is high due to cultural reasons. Collaboration with local eateries and marketplaces can result in more distribution channels and better visibility for example broilers are sold at nearby canteens and butcheries at Machipisa shopping centre.

4.5.4 Threats

The SWOT analysis from the research alluded that enterprise faces a variety of dangers. Competition from larger farms with more resources and economies of scale is a problem for example cheaper Irvine’s chicken portions and eggsare sold in nearby markets and it the substitute for live broilers and eggs from backyard agriculture. Agricultural market prices are volatile due to season variations and supply is subject to change as well, this affects profitability. Regulatory challenges, such as meeting food safety standards and environmental rules, necessitate careful management for example Kadoma city council of allows only 20 chickens to be reared per household. Food and nutrition act states that all agricultural food must be processed before selling for example livestock at abattoirs.

4.5.5 Summary and Prioritization

According to the SWOT analysis, the enterprise's advantages include its ability to manufacture high-quality organic produce and its proximity to the target market. The restricted land space for expansion and the scarcity of specialized farming equipment appear as significant disadvantages. The increased demand for locally sourced food and organic farming presents potential, while competition from larger farms and regulatory hurdles pose concerns.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

Introduction

The main objective of the study was to assess the impact of agricultural backyard enterprises on food security, to identify the various types of agricultural backyard enterprises, to identify the challenges that agricultural backyard enterprises face, and to assess the contribution of agricultural backyard enterprises to household income in Rimuka Game Park. Data gathered with the cooperation of school colleagues, using two instruments: semi-structured interviews and a self-administered questionnaire. Various analytical tools utilized to interpret and analyse findings, resulting in conclusions. The following are summaries of the research's main findings, recommendations, and conclusions.

5.1 Summary of major findings

5.1.1 Types of Agricultural Backyard Enterprises in Rimuka Gameparkand their Profitability.

The study reveals a variety of agricultural backyard enterprises in Rimuka Game Park, including vegetable gardening, chicken farming, rabbit meat production, dog breeding, dried grains/vegetable business, fruit orchards, and dog breeding. Vegetable gardening is the most profitable and sustainable business, with 33 of 82 respondents participating. Popular crops include tomatoes, tsunga, lettuce, peppers, grapes, basil, and mint.

According to the study,poultry farming classified into three types: broiler, layer, and roadrunner farming. Broiler farming is the most popular, accounting for 48% of responses, followed by layer farming (37%). Layer farming is a popular choice due to the steady need for eggs in the local market and the long-term profits it brings. Rabbit meat production is a profitable industry, with 6 out of 82 respondents raising rabbits for their lean, low-cholesterol, and nutritious protein source.

Dog breeding is another profitable backyard enterprise, with 15% of responders doing so. The research highlighted that breeders should examine different breeds, understand their unique requirements, and select breeding partners that complement one another in terms of temperament, health, and conformation. Dog breeding has a significant profit potential because there is a steady need for well-bred and healthy dogs, notably purebred German Shepherds, Rottweiler’s, and

designer breeds. The high selling price of puppies ranged between USD150 and USD450 depending on the breed, boosts to earnings. The research also highlighted that some residents are also active in the dried grain and vegetable enterprises. The agricultural backyard enterprise is profitable as well especially to those selling value added dried products.

The study also revealed that dog breeding is the most profitable enterprise with return per $ of $4. The market for dog breeding is niche and very demanding. The second profitable is vegetables with return per $1 invested of $3.85 and the third profitable is fruit orchard return per dollar of $3. One of the respondent noted that dog-breeding business is more profitable because of low input cost and high demand in Kadoma and the market extends to places like Gweru and Kwekwe .Demand is high because most people use dogs as valuable pets and for security reasons.

5.1.2 The Contribution of Agricultural Backyard Enterprises to Household Dietary Diversity.

Poultry production has a positive constant with a significant value of .005, whichwas as expected by the researcher. The Exp (B) of 1.520 means for every unit increase in poultry variable, the expected count of the HDDS increases by a factor of 1.520 or 52% holding other variables constant. Households with poultry can directly consume eggs and meat, which contributes to the diversity of their diet.

Vegetable gardening is another variable that is statistically at the value of .005 and a constant of .426. As shown by the results, for every increase in vegetable variable, the expected count of the HDDS increases by a factor of 1.531 or 53%. Households with vegetable gardens can directly consume a variety of fresh vegetables such as covo, tsunga, tomatoes, onions and lettuce and this contributes to the diversity of their diet.

Fruit orchard is significant at the level of 1.2% and it has a positive relationship with the dependent variable. For every unit increase in the fruit orchard variable, the expected count of the HDDS increases by a factor of 1.435% or 43% holding other variables constant. Fruit orchard based agricultural backyard enterprises can serve as a household asset that is drawn upon during times of need, providing a buffer against food insecurity and allowing for the purchase of diverse food items from money generated from selling fruits. Households with fruit orchards directly consume a variety of fresh fruits such as mangoes, oranges and papaya.

Dog breeding is significant at the level of 1.6% and for every increase in dog breeding variable, the expected increase of HDDS is by a factor of 1.413 or 41.3%, holding all other variables constant. Dog breeding is one of the most paying agricultural backyard enterprise and households generate a lot of income from it. These incomes purchase a diverse of food contributing to the household food security.

Rabbit business is significant at the level of 0.9% and for every unit increase in the rabbit variable, the expected count of the HDDS increases by a factor of 1.521% or 52%. Households can directly consume rabbit meat, which contributes to the diversity of their diet. Household income increases by selling rabbit meat or live animals.

5.1.3 The Contribution of Agricultural Backyard Enterprises to Household Income

From the results above backyard income is a significant positive predictor of household income (β= 2.056, p = .000 indicating 5% level of significance). This indicates that one unit increase income is associated with a 2.056 unit increase in household income when holding other variables constant. Backyard agricultural activities such as poultry and dogbreeding can provide households with additional income beyond primary employment. In addition, households that engage in agricultural backyard are able to reduce their expenses on certain food items by producing them at home for example meat from broiler. This can lead to cost saving that effectively increases the household's disposable income and overall financial well-being.

According to the study, 87% of respondents, including 71 participants, believe that selling agricultural produce, such as vegetables, fruits, and livestock provides money for households. This not only covers the costs of running the backyard farm, but it also generates revenue for the family. 92% of respondents said that growing their own food could lower grocery prices and free up household income for other purposes or savings. Value-added items, such as preparing preserves or generating homemade products like honey, sauces, or pickles, can also provide money for backyard businesses. 45% of respondents said that agro-tourism activities or farm experiences could help them diversify their revenue by attracting tourists and highlighting the uniqueness of their backyard business.

Secondly, 86% of participants stated that those who specialize in plant propagation, such as producing and selling seedlings or attractive plants, or livestock breeding, could produce revenue through the sale of propagated or bred products. For example, one participant focuses on cultivating and selling high-quality vegetable seedlings, notably spinach, as well as raising and selling German shepherd puppies. Finally, the study emphasizes the relevance of backyard enterprises in creating income, lowering food costs, and delivering value-added products. By focusing on these areas, backyard businesses can diversify their income streams while also contributing to the larger economy.

5.1.4 Challenges Faced By Agricultural Backyard Enterprise (SWOT Analysis)

The study SWOT analysis of an agricultural backyard enterprise identifies strengths such as high-quality organic food, direct control over production processes, and proximity to the target market. Weaknesses include insufficient land space for development, a need of specialized farming equipment, and seasonal production constraints. Opportunities include rising demand for locally sourced food, renewed interest in organic farming, and engagement with local restaurants and marketplaces. Threats include competition from larger farms, shifting market prices, and regulatory issues.

The SWOT analysis identifies strengths such as the ability to create high-quality organic produce and have direct control over manufacturing operations. However, drawbacks include limited field space, a lack of specialized farming equipment, and seasonal output constraints. Opportunities include gaining market share through increased demand for locally sourced food and growing interest inorganic farming, as well as partnerships with local restaurants and markets.

5.2 Conclusion

The research of agricultural backyard enterprises in Rimuka Game Park indicates a wide range of operations, such as vegetable gardening, chicken farming, rabbit meat production, dog breeding, dry grains/vegetable business, fruit orchards, and plant propagation. Dog breeding ranked as the most profitable and sustainable enterprise. Poultry farming, particularly broiler farming, and

vegetable production is a profitable enterprises that supply nutritional protein. Rabbit had a high profit potential, and breeders instructed to carefully choose breeding partners based on temperament, health, and conformation. The research also indicated that agricultural backyard enterprises have a great contribution to food security.

The report emphasizes the significant impact of agricultural backyard enterprises to household income. Selling agricultural produce, such as vegetables, fruits, and poultry, not only covers the costs of running backyard farms, but it also provides income for families. Growing one's own food reduces grocery prices, freeing up household income for other uses or savings. Value-added items, such as preserves, honey, sauces, and pickles, offer extra revenue prospects. Furthermore, agro-tourism activities and farm experiences is a way to diversify revenue sources and attract tourists, emphasizing the distinctiveness of backyard companies.

5.3 Recommendations

The study can contribute to the development and sustainability of agricultural backyard enterprises in Rimuka Game Park, enhancing their contribution to household income, food security in the local economy if the following recommendations practiced in a holistic manner.

Foster collaborations with agricultural backyard enterprises: There is need to **s**trengthen the link between agricultural enterprises and dietary diversity promotion. Encourage backyard farmers to grow a diverse range of fruits, vegetable, herbs and promote their consumption through local markets. Collaborate with agricultural extension services to provide training and support to backyard farmers on sustainable farming practices and diversification of crops.

Enhance access to affordable nutritious foods: Implement policies and programs that support the availability and affordability of diverse, nutrient-rich food in Kadoma. This can include initiatives like farmer’s markets, community gardens and subsidies for healthy food options.

Promote Vegetable gardening: Given that vegetable gardening has emerged as the most successful and sustainable backyard enterprise, promoting and supporting vegetable gardening

efforts can enable more people participate in this venture. This can include training programs, access to high-quality seeds, and knowledge of best methods for vegetable cultivation

Encourage Diversification: While vegetable gardening is popular, it is critical to promote diversity in agricultural backyard enterprises. This accomplishes by providing knowledge and training on various viable businesses including poultry farming, rabbit meat production, and dog breeding. Diversification can help people reduce risks and increase their earning potential

Provide technical Assistance: Several respondents expressed a need for specialist farming equipment. To solve this issue, giving technical advice and access to farming equipment can help create and grow agricultural backyard enterprises'. This accomplishes through collaboration with agricultural organizations or government bodies.

Support value added products: Preserves, honey, sauces, and pickles were cited as potential income sources for backyard businesses. Providing training and resources on value addition techniques, packaging, and marketing can help individuals boost the worth of their products and profits.

Foster agro-tourism opportunities: Agro-tourism activities and farm experiences are strategies to diversify revenue streams. Promoting agro-tourism activities, such as farm visits, workshops, or farm-stay lodgings, can attract tourists while also providing additional revenue for agricultural backyard operations. Collaboration with local tourism agencies may be advantageous in this regard.

Enhance market linkages: Agricultural backyard firms must strengthen their market links in order to succeed. This may entail forming agreements with local restaurants, markets, and grocery shops to maintain consistent demand for the produce and products. Creating platforms or networks that connect backyard businesses with potential buyers might help facilitate these connections.

Address Regulatory Issues: According to the study, regulatory difficulties may pose a threat to agricultural backyard enterprise. To help these businesses grow, it is critical to overcome any regulatory impediments or challenges they may face. This can include campaigning for legislation

that enable and encourage small-scale agricultural activities, streamlining licensing processes, and offering advice on regulatory compliance.

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APPENDIX:

QUESTIONNAIRE BINDURA UNIVERSITY OF SCIENCE EDUCATION

QUESTIONNAIRE

Topic;"**Assessing the Role of Urban Agricultural Backyard Enterprises on Household Food Security and Income: A case of Rimuka Gamepark suburb, Kadoma District**"

My name is Lorraine Tanatswa Jere, a student at Bindura University of science education studying a Bachelor Science Degree in Agricultural Economics and Management. l am doing this study to assess the role of urban backyard enterprises on food security. This is done in partly fulfilment of the degree prerequisite. For my research to be successful, your assistance is greatly appreciated in responding to the questions. This information will help the policy makers, government, entrepreneurs and non-government organizations.

Section A: Socio-Demographic Characteristics

1) Location

2) Age (years)

3) Gender 1=male 2=female.....

4) Educational level 1=primary 2=secondary 3=advanced 4=tertiary

5) Household size

6) Occupation.....……..

7) Marital status 1= single. 2= married 3=divorced 4=complicated

8) Are you a full time urban backyard entrepreneur? 1=Yes 2=No

9) How many household members actively participate in the backyard enterprise?

Section B: Urban backyard enterprises

10) What is the type of the urban backyard enterprise 1=broiler 2=layers 3=vegetables 4=orchard 99=other (specify).....

11) Are there adequate natural resources for backyard agriculture (land, water, access to inputs) 1=Yes 2=No 3=Partial availability (specify).....…….

12) Do you have skills, knowledge or training related to backyard agricultural 1=Yes 2=No

13) Have you adopted any technology or innovation in backyard agricultural 1=Yes 2= No

14) If yes specify.....

15) Are there any support services available for use (extension service, training programs or market information) one=Yes 2=No 99=other (specify)……

16) For each of the enterprises stated, Specify the enterprise age in years ...

Enterprise	Experience doing it/age of enterprise

17) How much to you get from each of the enterprise. .....

Enterprise	Income generated per cycle	How many cycles per year	Variable costs involved per cycle			

18) How much to do you consume from the enterprise.....1=50-100% 2=1-49%

19) How much from the enterprise do you sell.....1=50-100% 2=1-49%

Profitability (for poultry enterprises)

	Quantity	Unit price	Total
Birds produced			
Eggs			
Manure			
TOTAL VARIABLE COSTS			
Chicks			
Feed			
Veterinary			
Labour			
Transport			
Packaging			
Other costs			
Mortality rate			

Profitability Vegetables

	Quantity	Unit price	Total
Bundles produced			

TOTAL VARIABLE COSTS			
Seedlings			
Manure			
fertilizer			
Pesticides			
Labour			
Transport			
Packaging			
Other costs			

20) Have you ever received training to enhance skills for the enterprises that you engage in 1=yes 2=no

21) If yes specify the stakeholder who provided the training one=Ministry of youth two=Ministry of Agriculture 99=Other (Specify)…….

22) Do you keep records (production and financial records) for your enterprises to measure productivity/profitability? 1=yes 2=no

Section B: Challenges faced by urban backyard enterprises.

23) Do you have the market for the produce? 1=Yes. 2=No

24) What marketing channel are you participating to? 1=Formal 2= Informal 3 =both

25) Do you face challenges in conducting the business? 1=Yes 1=No

26) If yes state the challenges.....

27) Are there any policies affecting backyard agriculture 1=Yes 2=No (specify).....

Household food security

28) In the past 12 months, how often have you or other adults in your household consumed food that was grown or produced in backyard enterprises? 1=never 2=rarely 3=most of the times 4 =always

29) Do you share or sell any of the food you produce in your backyard enterprise? Yes=1 No=2

30) If so, what proportion of the food do you share or sell? 1= 50-100% 2=1-49%

31) What propitiation of household's food needs met by food from your backyard enterprise? 1=50-100% 2=1-49%

32) Does your food consumption pattern change during different seasons? 1=Yes 2=No

33) To what extent to you rely on backyard agriculture for food consumption. 1= greater 2= lesser

34) What is the proportion of food that comes from backyard produce compare to purchased or traded items?1= more 2= less …….

35) What are the factors that influence dietary diversity 1=income 2=cultural preferences 3=availability of certain food 99=other (specify....)…….

36) Do you have any recommendations for improving the productivity or impact of urban backyard enterprises? Yes= 1 No=2

37) If yes specify.....

HDDS

No	Food Group	Score Yes=1 No=2
1	Fruits	
2	Vegetables	
3	Meat,poultry	
4	Eggs	
5	Legumes and nuts	
6	Milk and milk products	

7	Fish	