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Examining the Effectiveness of Agricultural Productivity on Household Living Conditions

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Abstract

This study examines the effectiveness of agricultural productivity on household living conditions, focusing on small-scale farmers in Kamfisa Constituency. The specific objectives include analyzing the relationship between agricultural productivity and household income, assessing farmers' knowledge levels of sustainable agricultural practices and innovation adoption, and identifying challenges faced by farmers in optimizing productivity. The research employed both qualitative and quantitative methods, targeting a population of 40 small-scale farmers and 10 Ministry of Agriculture officers, using random sampling to select 50 respondents. Data was collected via structured questionnaires and analyzed using SPSS software. Findings reveal a significant positive relationship between agricultural productivity and household income, with 70% of respondents reporting that increased productivity proportionally enhances income levels. The primary factors influencing this relationship are access to modern farming technologies and climate variability. In low productivity regions, 55.7% of respondents recommend stricter agricultural trade regulations, while 44.3% suggest income

diversification. Challenges such as high input costs, poor input quality, limited access to modern equipment, and inadequate training significantly hinder productivity. Sustainable farming practices are recognized for their benefits, with 60% of respondents noting significant improvements in productivity and income levels. Crop rotation and diversification are deemed sustainable practices by 75.3% of farmers, while awareness and education gaps are identified as major barriers to the adoption of sustainable practices. To address these challenges, recommendations include enhancing access to modern farming technologies, diversifying income sources, reducing input costs, and improving training and education on sustainable practices. Bridging the knowledge gap through government extension services and formal education, improving access to credit, and enhancing infrastructure are crucial for optimizing agricultural productivity and stabilizing household incomes. Effective pest and disease management strategies and market dynamics management are also vital to ensuring sustainable improvements for small-scale farmers in Kamfisa Constituency.

Keywords: Agricultural, Productivity, Household Living Conditions, Scale Farmers and Household Income, Sustainable Agricultural Practices, Innovation Adoption, and Challenges

1. Introduction

1.1 Background of the study

In Zambia small-scale farmers constitute a significant portion of the population whose livelihoods depend on agricultural productivity. This study delves into the critical relationship between agricultural productivity and household living conditions among small-scale farmers in the Kamfisa Constituency (Copperbelt province). Kamfisa is one of the constituencies on the copperbelt covering part of south-east of Kitwe District together with the rural area that includes the town of Mwekera.

Kamfisa Constituency is characterized by its predominantly agrarian economy, with the majority of the population engaged in subsistence farming. According to the Zambia National Farmers' Union (ZNFU), small-scale farmers constitute over 85% of the farming population in Zambia, highlighting the significance of agriculture in the livelihoods of rural communities.

1.2 Statement of the problem

This study focuses on the limitations faced by small-scale farmers in the Kamfisa Constituency, Zambia, regarding the effectiveness of agricultural productivity on household living conditions. Key problems include limited access to modern farming inputs, such as improved seeds and fertilizers (FAO, 20%), inadequate infrastructure, unpredictable weather patterns, and restricted market access. These limitations collectively hinder agricultural productivity and subsequently impact household incomes and living conditions. The Ministry of Agriculture and Livestock's survey underscores the direct link between increased agricultural productivity and improved access to nutritious food, healthcare, and education for children in rural households. To address these challenges, policy reforms and targeted interventions are crucial. Initiatives like the Farmer Input Support Program (FISP) and the Smallholder Agribusiness Development Initiative (SADI) are steps taken by the Zambian government.

1.3 General objective of the study

The purpose of this study is to examine the effectiveness of agricultural productivity on household living conditions: Case study of small scale farmers of Kamfisa Constituency.

1.3.1 Specific objectives

1. To analyze the relationship between agricultural productivity and household income levels among small-scale farmers in the Kamfisa Constituency.
2. To examine knowledge levels of small-scale farmers regarding sustainable agricultural practices and innovation adoption.
3. To identify limitations faced by small-scale farmers in optimizing their agricultural productivity in the Kamfisa Constituency.

1.4 Research questions

1. What is the nature of the relationship between agricultural productivity and household income levels among small-scale farmers in the Kamfisa Constituency?
2. How do the knowledge levels of small-scale farmers influence the adoption of sustainable agricultural practices and innovation?
3. What are the primary limitations faced by small-scale farmers in optimizing their agricultural productivity in the Kamfisa, and how do these factors impact their livelihoods?

1.5 Theoretical Framework

In examining the effectiveness of agricultural productivity on household living conditions among small-scale farmers in the Kamfisa Constituency, the study will draw upon several theoretical frameworks to guide its analysis and interpretation. One such framework is the Sustainable Livelihoods Approach (SLA), which provides a comprehensive lens through which to understand the interplay between agricultural productivity, household livelihood strategies, and well-being.

According to the SLA (2023), livelihoods are viewed as a multi-dimensional construct influenced by various assets, including natural, physical, financial, human, and social capital. In the context of small-scale farming in the Kamfisa these assets shape farmers' ability to engage in productive activities, manage risks, and enhance their overall quality of

life. By applying the SLA, the study will assess how improvements in agricultural productivity contribute to the accumulation and utilization of livelihood assets among small-scale farmers.

Furthermore, the study will integrate elements of the Sustainable Agriculture Framework (SAF), which emphasizes environmentally sound and socially equitable approaches to agricultural production.

Moreover, the Capability Approach (CA) will inform the study's exploration of household living conditions and well-being. Originating from the work of Amartya Sen and Martha Nussbaum, the CA emphasizes the importance of individual capabilities and freedoms in assessing human development.

In integrating these frameworks, the study seeks to provide a holistic understanding of the dynamics shaping agricultural productivity and household living conditions among small-scale farmers in the Kamfisa District.

2. Overview

This chapter reviews the literature from various sources to let the researcher know what others have done about the proposed research topic. The researcher will be able to identify the existing knowledge gap by reviewing various literatures. The chapter, therefore, reviews literature from the global perspective, the African perspective, and then trickles down to the Zambian perspective.

2.1 The relationship between agricultural productivity and household income levels among small-scale farmers in the Kamfisa Constituency

Understanding how agricultural productivity influences household income is crucial for crafting effective policies and interventions to enhance the livelihoods of small-scale farmers. This report aims to delve into empirical studies that elucidate the complex relationship between agricultural productivity and household income levels in Kamfisa, drawing insights from various research findings and methodologies.

2.1.1 Agricultural Productivity

Agricultural productivity refers to the efficiency of agricultural production, often measured by output per unit of input, such as labor, land, or capital. Household income, on the other hand, encompasses earnings generated from various sources, including agricultural activities, off-farm employment, and government subsidies. The relationship between agricultural productivity and household income levels among small-scale farmers is multifaceted, influenced by numerous factors, including technological advancements, market conditions, government policies, and environmental factors (Mwape and Mofwa 2019).

2.2 Knowledge Levels of small-scale farmers regarding sustainable agricultural practices and innovation adoption

In Zambia, the knowledge of small-scale farmers concerning sustainable agricultural practices and innovation adoption has become a pivotal focus in contemporary agricultural discourse. Sustainable agriculture aims to meet the needs of the present while safeguarding resources for future generations, emphasizing environmental, economic, and social aspects. Small-scale farmers play a crucial role in this context, as they often face unique challenges and opportunities.

2.3 Poor Infrastructure

Furthermore, inadequate infrastructure and logistics pose significant challenges for small-scale farmers in Malaysia. Research conducted by Ismail *et al.* (2018) highlights the adverse effects of poor transportation networks and inadequate storage facilities on agricultural productivity. Small-scale farmers often face difficulties in transporting their produce to markets due to unreliable road networks and limited access to transportation services.

2.4 Market Access and Price volatility

A study by Brown and Miller (2018) highlights the vulnerability of small-scale farmers to fluctuations in market prices and demand dynamics, particularly in the context of globalized agricultural markets. Small-scale farmers often lack the bargaining power and economies of scale enjoyed by larger agricultural producers, making them more susceptible to price fluctuations and market uncertainties.

3. Research Methodology

3.1 Overview

This chapter presents the research design and methodology used to address the research questions in the study. In this chapter, we present the sources and methods of data collection, the target population, and data analysis techniques.

3.2 Research Design

The study utilizes a cross-sectional survey methodology as it is versatile in terms of gathering both qualitative and quantitative data. It allows for the study to be conducted at a specific time, and the idea of combining qualitative and quantitative data in a case study research holds out the possibility of getting closer to the entirety of a case than can be accomplished by a study using just one method.

3.3 Target Population

The study's target 40 small scale farmers of Kamfisa Constituency and 10 ministry of agriculture officers.

3.4 Sampling Design

In this study, we use the random sampling technique to collect data. Creswell (2005) defines random sampling as a subset of individuals that is randomly selected from a population.

3.5 Data Collection Methods

Primary data is collected through a structured questionnaire that is prepared. The questionnaire method is preferred since it ensures a high response rate and accurate sampling. The questionnaires include both open-ended and closed-ended questions.

3.6 Data Analysis

To examine the data gathered for the study, quantitative methodologies are used. In order to analyze the quantitative data, descriptive statistics comprising frequency, percentage, mean, and standard deviation are calculated using SPSS software. Visual tools for data presentation, such as graphs and charts, are also created using Microsoft Excel.

4. Presentation and Interpretation of Findings

4.1 Overview

The main objective of this study was to the aim of the study is to examine the effectiveness of agricultural productivity on household living conditions: Case study of small scale farmers of Kamfisa Constituency. Findings are mainly presented in form of frequency tables and pie charts.

4.2 Background information of the respondent

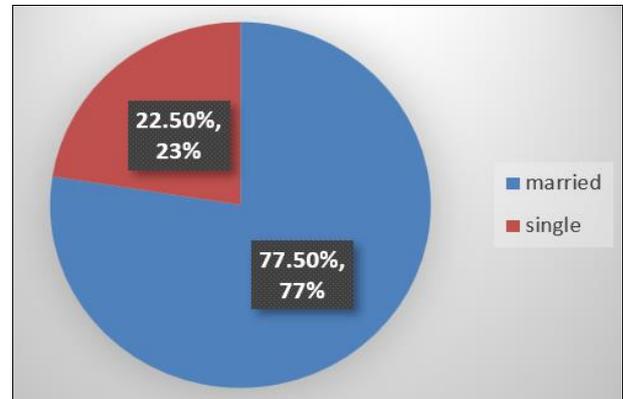


Fig 4.1.1: Marital status

The study requested respondent to indicate marital status. 77.50% of the majority respondent indicated married while 22.50% of the respondent indicated single.

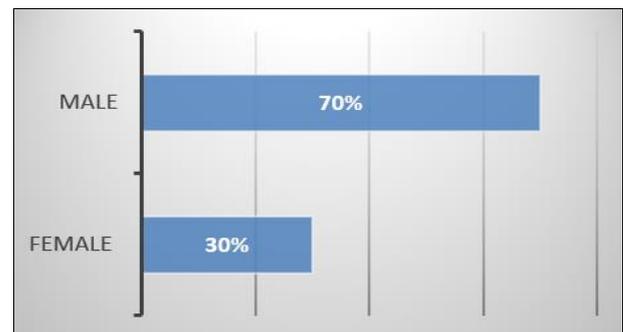


Fig 4.1.2: Gender

The study requested respondent to indicate gender. 70% of the majority respondent indicated male while 30% of the respondent indicated female.

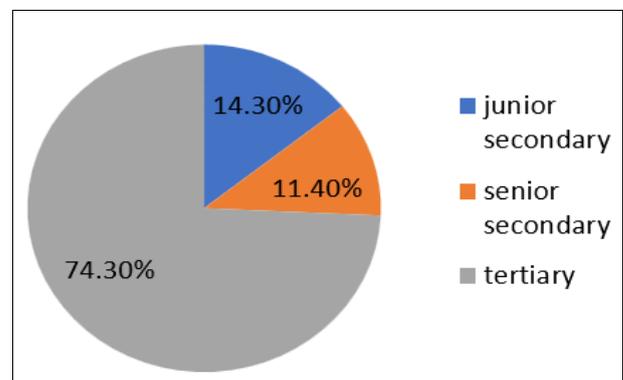


Fig 4.1.3: Education

The study requested respondent to indicate education. 74.30% of the majority respondent indicated tertiary, 14.40% of the respondent indicated junior secondary and 11.40% of the respondent indicated senior secondary.

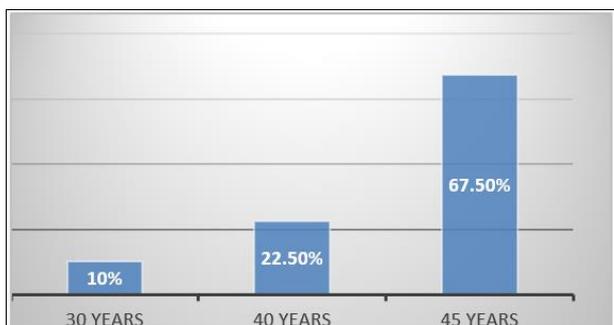


Fig 4.1.4: Age

The study requested respondent to indicate age. 67.5% of the majority respondent indicated age 45 years, 22.5% of the respondent indicated 40 years and 10% of the respondent indicated 30 years.

4.3 Limitations faced by small-scale farmers in optimizing their agricultural productivity in the Kamfisa Constituency

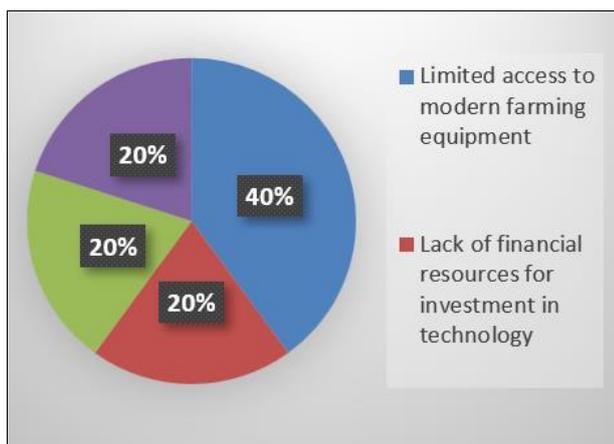


Fig 4.2.1: What are some common limitations faced by small-scale farmers in optimizing agricultural productivity?

The study revealed that limited access to modern farming equipment was the most common limitations facing the farmers in Kamfisa.

4.4 Relationship between agricultural productivity and household income levels among small-scale farmers in the Kamfisa Constituency

Figure 4.3.1 How does increased agricultural productivity typically affect household income levels among small-scale farmers?

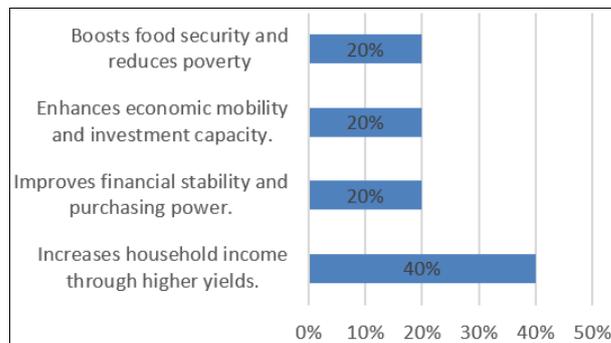


Fig 4.3.2: In households where agricultural productivity has increased, what has been the primary outcome on income?

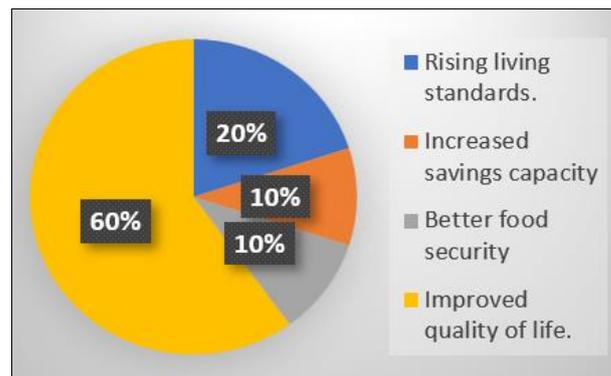
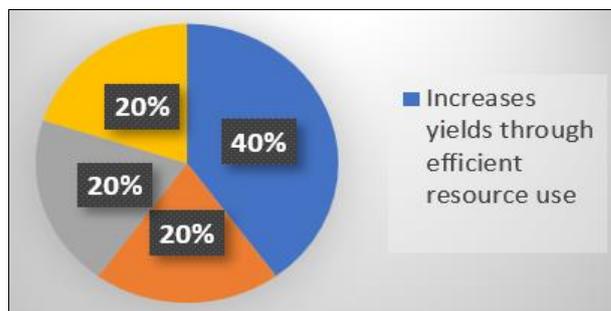


Fig 4.3.4: How does the adoption of sustainable farming practices affect agricultural productivity and household income levels?



Model	Sum of Squares	Df	Mean Square	F	Sig.	Model
1	Regression	62.921	1	62.921	62.078	.000 ^b
	Residual	68.922	68	1.014		
	Total	131.843	69			

a. Dependent Variable: Agricultural productivity
 b. Predictors: (Constant), Household income

Table 2.2.7: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	1.335	.327		4.087	.000
1	Household income	.698	.089	.691	7.879	.000

a. Dependent Variable: Agricultural productivity

The table presents the results of a regression analysis examining the impact of agricultural productivity on household income. The model indicates that agricultural productivity significantly influences household income, as evidenced by a high standardized coefficient (Beta = 0.691) and a t-value of 7.879, which is statistically significant ($p < 0.001$). The unstandardized coefficient for agricultural productivity is 0.684, with a standard error of 0.087. This means that for each unit increase in agricultural productivity, household income increases by 0.684 units. The constant term is 0.879, with a standard error of 0.345, and is also statistically significant ($p = 0.013$), indicating that when agricultural productivity is zero, household income is 0.879 units. Overall, the model demonstrates a strong and positive relationship between agricultural productivity and household income (Chisenga & Siame 2020).

Another 20% of respondents highlighted the role of agricultural productivity in boosting food security and reducing poverty, which is consistent with broader research findings. Increased productivity typically results in surplus food availability, ensuring that farming households can meet their dietary needs while reducing expenditures on food. This outcome is significant in regions facing food scarcity, where the primary source of sustenance is often limited to what can be produced domestically.

4.5 Discussion of the findings

4.5.1 Relationship between agricultural productivity and household income levels among small-scale farmers in the Kamfisa Constituency

Research on agricultural productivity and its relationship with household income among Small scale farmers indicate multifaceted impacts, as suggested by the survey findings involving smallholder respondents. This study highlights that increased agricultural productivity frequently enhances household income by improving yields, leading to variety of positive socio-economic effects, though. To begin, the study's results show that 40% of respondents perceive increased agricultural productivity as a direct mechanism for boosting household income through higher yields, a finding corroborated by studies that link yield increases to income enhancement.

Another 20% of respondents in the study indicated that increased agricultural productivity improves financial stability and purchasing power. This aligns with findings from empirical studies indicating that with greater productivity, households can better handle seasonal income fluctuations, manage expenses more efficiently, and invest in goods and services that were previously unaffordable. Similarly, 20% of respondents noted that increased agricultural productivity leads to enhanced economic mobility and investment capacity. Education and training, as well as government support and policies, were each identified by 20% of respondents as critical influencers. These factors are well-documented in agricultural research as instrumental in building small-scale farmers' capacity to optimize productivity and manage financial gains effectively (FAO, 2023). Educated farmers are better equipped to adopt new practices, manage resources efficiently, and respond to market demands, making education an essential aspect of productivity improvements. Similarly, supportive government policies can facilitate access to credit, training, and market opportunities, all of which enhance the

productivity-income relationship.

Lastly, the study explored factors most likely to influence the relationship between productivity and household income, with findings indicating that 40% of respondents viewed market access as the primary influencer. Importance of robust market infrastructure for income improvements among smallholder farmers.

5. Conclusion and Recommendations

5.1 Overview

This chapter presents the conclusions and recommendations derived from the study that aimed examining the effectiveness of agricultural productivity on household living conditions: Case study of small scale farmers of Kamfisa Constituency.

5.2 Conclusion

In conclusion, the study reveals that increased agricultural productivity generally enhances household income levels among small-scale farmers, with 70% of respondents affirming a proportional relationship. The most influential factors affecting this relationship are access to modern farming technologies and climate variability. Strategies to boost household income in low productivity regions include stricter agricultural trade regulations and income diversification. Major challenges for small-scale farmers include high costs and poor quality of agricultural inputs, and the adoption of sustainable farming practices significantly improves productivity and income. Regression analysis confirms a strong positive relationship between agricultural productivity and household income. Additionally, small-scale farmers recognize the importance of sustainable practices like crop rotation, and bridging the knowledge gap through government services and education programs is crucial. However, limitations such as limited access to modern equipment, insufficient training, and inadequate infrastructure persist, impacting productivity and income stability. Effective strategies must address these multifaceted issues to ensure sustainable improvements in agricultural productivity and household income for small-scale farmers.

5.3 Acknowledgements

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