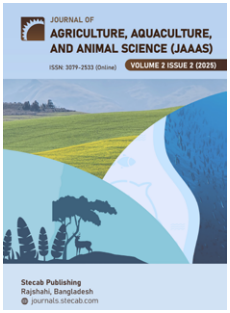

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Research Article

Examining the Effects of Agricultural Productivity on Household Well-Being: A Case Study of Chongwe Farming Block II

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About Article

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ABSTRACT

This study examines the impact of agricultural productivity on household living conditions in Chongwe Farming Block II, with a focus on food security, diversification, value addition, and the challenges faced by local households. Using a descriptive research design, data were gathered through questionnaires from 50 informants, including local farmers and Ministry of Agriculture representatives. Statistical analyses, aided by SPSS, revealed that enhanced agricultural productivity correlates positively with improved food security through higher incomes, greater dietary diversity, and household resilience to shocks. Diversification and value addition also play pivotal roles in boosting household incomes, job creation, and market access, thereby elevating living standards. However, productivity is hindered by limited access to modern farming inputs, knowledge gaps, and environmental issues such as soil degradation and climate variability. The study recommends policy reforms to support resource allocation, infrastructural development, and capacity-building initiatives. Strengthened cooperative networks, sustainable land management practices, and public-private partnerships are emphasized as essential strategies for fostering long-term agricultural growth and improved household well-being. The data overwhelmingly suggests a positive correlation between increased agricultural productivity and improved household food security. With 66% of respondents indicating a strongly positive correlation and an additional 20% noting a moderate positive correlation, it's evident that higher agricultural productivity leads to better food security outcomes for households in the region. This research underscores the transformative potential of sustainable agricultural practices in alleviating poverty and promoting socio-economic development in rural Zambia.

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1. INTRODUCTION

1.1. Overview

This chapter will give an outline on the background of the study, its statement of the problem, the general objective, its specific objectives and the research questions. It will then look at the significance of the study and the conceptual framework. The aim of this study was to examine the effects agricultural productivity on household living conditions in Chongwe district of Lusaka, Zambia.

1.2. Background

Agricultural productivity plays a pivotal role in shaping household living conditions across the globe. It encompasses various factors such as crop yield, land productivity, and technological advancements in farming practices. Firstly, agricultural productivity directly influences income levels within rural households. According to the Food and Agriculture Organization (FAO), approximately 70% of the world's poor live in rural areas and depend on agriculture for their livelihoods (FAO, 2020). Increased productivity translates to higher yields and income for farming households, thereby improving their living standards. For instance, a study by the World Bank found that a 10% increase in agricultural productivity could lead to a 7% reduction in poverty in developing countries (World Bank, 2019).

Agricultural productivity also influences access to infrastructure and basic services in rural areas like Chongwe Farming Block II. Improved agricultural output attracts investments in roads, water supply, and healthcare facilities. The United Nations Development Programs (UNDP) notes that investments in rural infrastructure are essential for poverty reduction and sustainable development (UNDP, 2018). In Chongwe Farming Block II, enhanced agricultural productivity can lead to better roads, schools, and healthcare services, thereby improving living conditions.

Moreover, agricultural productivity has environmental implications that can affect household living conditions in the long term. Intensive farming practices aimed at increasing productivity can lead to environmental degradation, soil erosion, and depletion of natural resources. Sustainable agricultural practices that focus on enhancing productivity while conserving the environment are crucial for ensuring the resilience of rural households. According to the World Resources Institute (WRI), sustainable intensification practices such as agroforestry and precision agriculture can increase yields while reducing environmental impacts (WRI, 2021). Balancing productivity with environmental sustainability is essential for safeguarding the well-being of current and future generations.

1.3. Statement of the problem

The examination of the effect of agricultural productivity on household living conditions faces several challenges. Firstly, disparities in access to resources and technology hinder equitable distribution of productivity benefits, particularly impacting marginalized groups (FAO, 2018). Additionally, environmental degradation resulting from intensive farming practices poses a long-term threat to sustainable living conditions (WRI, 2021). Gender inequalities persist, with women in agriculture facing limited access to resources and markets (IFPRI, 2020). These challenges underscore the need for targeted interventions to ensure that the benefits of increased agricultural productivity reach all members of rural households. Addressing these challenges requires a multifaceted approach. Implementing policies that promote inclusive access to resources and technology, particularly for women, is crucial (IFPRI, 2020). Encouraging sustainable agricultural practices, such as agroforestry and precision agriculture, can mitigate environmental impacts (WRI, 2021). Furthermore, fostering partnerships between governments, NGOs, and the private sector can create comprehensive solutions to enhance household living conditions through improved agricultural productivity.

1.3.1. General objective

The general objective of the study is to examine the Effect of Agricultural Productivity on Household Living Conditions: a case study of Chongwe farming block II.

1.3.2. Specific objectives

i. To examine the effects of agricultural productivity on household food security.

ii. To ascertain effects of agricultural diversification and value addition to enhancing household living conditions.

iii. To establish hindrances faced by households in Chongwe Farming Block II concerning agricultural productivity.

1.4. Research questions

i. How does agricultural productivity influence household food security?

ii. How can agricultural diversification and value addition contribute to enhancing household living conditions?

iii. What are the specific hindrances faced by households in Chongwe Farming Block II regarding agricultural productivity?

1.5. Theoretical frameworks

In exploring the effect of agricultural productivity on household living conditions in Chongwe Farming Block II, the Theory of Agricultural Transformation provides a comprehensive framework. This theory, as proposed by Johnson (1975), posits that the transformation of traditional agricultural practices into more modern, efficient systems can lead to significant socio-economic changes in rural communities (Johnson, 1975). The essence of this theory is relevant to the case study as it allows for the examination of how shifts in agricultural productivity, influenced by technological advancements, market integration, and sustainable practices, shape the overall living conditions of households in Chongwe.

According to the Theory of Agricultural Transformation, improvements in agricultural productivity, such as increased crop yields or the adoption of new farming techniques, can result in elevated income levels for households (Barrett *et al.*, 2001). This income growth, in turn, affects various dimensions of living conditions, including access to education, healthcare, and improved housing. Moreover, the theory acknowledges that challenges may arise during the transformation process,

such as disparities in resource access and adaptation to new technologies (Diao *et al.*, 2012).

1.6. Significance of the study

The significance of studying the effect of agricultural productivity on household living conditions within Chongwe Farming Block II holds multifaceted importance. Firstly, it addresses a critical nexus between agricultural productivity and the well-being of households in a specific regional context, offering insights into how improvements or fluctuations in productivity directly impact income, food security, education, healthcare access, housing quality, and overall quality of life within this community.

This study's significance lies in its potential to inform sustainable development strategies and policies tailored to the unique challenges faced by households in Chongwe Farming Block II. By pinpointing the challenges hindering agricultural productivity, such as market limitations, resource access, and climate vulnerabilities, this research can pave the way for targeted interventions and initiatives aimed at mitigating these challenges.

1.7. Scope of the study

The scope of this study, examining the effect of agricultural productivity on household living conditions within Chongwe Farming Block II, encompasses a multifaceted investigation across several dimensions. Firstly, the research will extensively explore the direct impact of agricultural productivity on various facets of household well-being, including income levels, food security, education, healthcare access, housing quality, and overall socio-economic conditions.

2. LITERATURE REVIEW

2.1. 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.

2.2. Effects of agricultural productivity on household food security

Several empirical studies have shed light on the significant influence of agricultural productivity on household food security in Nigeria. A study conducted by Aromolaran and Abdoulaye (2017) utilized data from the Nigeria General Household Survey to examine the relationship between agricultural productivity and food security. The findings indicated that improvements in agricultural productivity positively correlated with enhanced food security at the household level, particularly in rural areas. Similarly, Oyekale (2016) investigated the impact of agricultural productivity on food security using nationally representative data. The study highlighted that increased agricultural productivity, particularly in staple food crops, significantly contributed to improved food security among Nigerian households. Additionally, a study by Ajibefun and Olajide (2018) emphasized the role of agricultural policies in enhancing food security, showcasing how investments in agricultural productivity and infrastructure positively affected household food availability and access in Nigeria. These empirical studies collectively underscore the crucial link between agricultural productivity and household food security, emphasizing the need for strategies that bolster agricultural productivity to ensure food security for Nigerian households.

The collective evidence from these empirical studies solidifies the notion that interventions aimed at boosting agricultural productivity serve as a fundamental driver in enhancing food availability, access, and overall food security for households across diverse regions in Zambia. This positive relationship underscores the importance of sustained efforts and targeted interventions to continue improving agricultural productivity as a means to fortify food security and mitigate hunger in the country.

2.3. Effects of agricultural diversification and value addition to enhance household living conditions

Agricultural diversification and value addition have been recognized as potential strategies to enhance household living conditions and resilience in Nigeria. A growing body of empirical studies highlights the potential of agricultural diversification and value addition to enhance household living conditions and resilience in Nigeria. In a study by Oladeebo and Adejobi (2020), it was found that agricultural diversification significantly improved household income and food security levels in rural Nigeria. By engaging in a variety of agricultural activities beyond staple crops, households were able to mitigate risks associated with market fluctuations and climate variability. Furthermore, research by Ajayi *et al.* (2018) emphasizes the role of value addition in enhancing the economic viability of agricultural production in Nigeria. Through processing and adding value to agricultural products, households can command higher prices and increase their income levels. This study underscores the importance of investing in value chain development and agro-processing facilities to unlock the full potential of agricultural diversification.

Moreover, empirical evidence suggests that agricultural diversification contributes to improving dietary diversity and nutrition outcomes among Nigerian households. A study by Okunmadewa *et al.* (2019) demonstrated that diversifying agricultural activities led to increased consumption of nutritious foods and reduced vulnerability to malnutrition. This underscores the importance of promoting diverse farming practices to address food insecurity and improve household resilience.

Additionally, agricultural diversification has been shown to enhance environmental sustainability and resilience to climate change in Nigeria. According to Oladeebo and Adejobi (2020), integrating diversified farming systems such as agroforestry and intercropping helps conserve soil fertility, water resources, and biodiversity. These sustainable practices mitigate the adverse effects of climate change and contribute to the long-term resilience of farming communities.

Furthermore, research by Ngoma *et al.* (2017) emphasized the importance of sustainable agricultural practices in

enhancing household resilience and food security. Sustainable intensification methods, such as conservation agriculture and agro ecology, can improve soil fertility, water management, and crop yields while mitigating environmental degradation. Integrating sustainable practices into agricultural diversification and value addition efforts is essential for ensuring long-term resilience and well-being.

2.4. Challenges faced by households in chongwe farming block II concerning agricultural productivity

Several empirical studies have shed light on the challenges encountered by households in Nigeria's Farming Block II concerning agricultural productivity. Several empirical studies have shed light on the challenges faced by households in Nigeria, particularly within farming blocks, regarding agricultural productivity. A study by Olayide and Heidhues (2014) conducted in Nigeria's agricultural sector identified challenges such as inadequate access to credit, limited extension services, and poor infrastructure as significant impediments to optimal agricultural productivity. Additionally, the research highlighted the impact of climate variability on crop yields, emphasizing the vulnerability of farming households to environmental changes. Furthermore, findings from a study by Amaza *et al.* (2016) underscored the role of socio-economic factors in shaping challenges related to agricultural productivity in Nigeria. The research revealed that issues like land tenure systems, unequal distribution of resources, and limited market access significantly influenced the ability of households in farming blocks to enhance their agricultural output. These challenges, when unaddressed, contribute to persistent poverty and hinder overall improvements in living conditions.

Moreover, Oyinbo and Ogunsumi (2017) explored technological challenges faced by Nigerian farming households, emphasizing the importance of adopting modern agricultural practices. The study indicated that a lack of access to advanced farming technologies and inadequate training hindered the adoption of more efficient and sustainable farming methods, affecting overall productivity.

Additionally, a study by Ajibefun *et al.* (2018) delved into gender dynamics as a critical factor in the challenges faced by Nigerian households in farming blocks. The research highlighted disparities in resource access and decision-making power between men and women, demonstrating that gender-based constraints contribute to inefficiencies in agricultural practices and, subsequently, reduced productivity.

2.5. Personal critique of literature review

The literature review presents a comprehensive overview of the existing research, offering valuable insights into the multifaceted relationship between agricultural productivity and household living conditions. It effectively outlines various dimensions of household well-being influenced by agricultural productivity, including income, food security, education, healthcare access, and housing quality, providing a clear framework for understanding the study's scope.

Furthermore, the literature review could expand on sustainability aspects related to agricultural practices within this specific farming block. A deeper exploration of sustainable agricultural methods employed, their effectiveness in enhancing productivity while maintaining environmental sustainability, and their impact on long-term household well-being would enrich the study's depth and relevance.

2.6. Establishment of research gaps

Establishing research gaps regarding the effect of agricultural productivity on household living conditions within the context of Chongwe Farming Block II involves identifying areas where existing studies and knowledge fall short. Firstly, while studies have explored the general impact of agricultural productivity on living conditions, there's a scarcity of in-depth analysis specific to Chongwe Farming Block II. Most existing literature tends to focus on broader agricultural trends in Zambia rather than honing in on the nuances of this particular farming block. Additionally, while challenges faced by households in agricultural productivity have been acknowledged, the specific, localized challenges unique to Chongwe Farming Block II have not been extensively documented or studied in depth. Factors such as market access, technological limitations, resource constraints, and socio-economic disparities need further exploration to tailor interventions effectively.

3. METHODOLOGY

3.1. Overview

i. This chapter gives a description of the methods that will apply in carrying out the research study. It also gives the description of the study area in which the study was carried out and provides reasons why the chosen methods were appropriate to gather the information needed to answer the questions posed by the research problem. It concentrates on the research design, target population, sample size, sampling procedure, research instruments, data collection procedure and analysis thereafter Food and Agriculture Organization (FAO). (2018). Challenges in Italian Agriculture: Land Fragmentation, Limited Farm Size, and Aging 12 Farmers (Wang & Zhang, 2020).

3.2 Research design

This section focuses on the research design which provides the basis for the thesis. A descriptive research design was used. In terms of quantitative research, a survey will undertake based on a questionnaire. Mouton and Marais (1990) indicate that quantitative method is the approach that is formalized and controlled, with an exactly defined range and relatively close to the discipline of the physical sciences. Quantitative methods are approaches that deal with data that is quantifiable and principally numerical. The reason for employing a quantitative design is intended to select samples that represent the population of the area of the study in order to generalize the findings. The rationale of using a quantitative research method is also premised upon the work of Ader, Mellenberg and Hand (2008) who argue that quantitative research methods are suitable when undertaking the study that is targeting a particular community. Mellenberg and Hand (2008) further indicate that quantitative research methods provide the following advantages: the cost is reasonably low and data collection is faster when sampling is used instead of surveying the entire population. Quantitative research design therefore

improves the efficiency of random effects modeling and allows realistically problems to be analyzed. De Vos (1998) argues that in quantitative research predictions are made and tested. The aim of quantitative research is to formulate explanatory theories that are predictive and testable. Quantitative research provides an objective basis for evaluating claims of relationships.

3.3.Target population

Is the whole group of elements or objects which researchers want to study and make general conclusions? The target population usually has varying characteristics and it is also known as the theoretical population. According to Ngechu (2004), a target population is a distinct or determined group of objects, people, services, elements, events, things or households that are under study. Agreeing to the definition therefore a target population of interest should be homogeneous. Target population studies are an enhanced representation since all members have equal chance to be counted in the final sample that is obtained according to Bryman (2006). Kothari (2004) explains target population as the sum total of constituents about which conclusions are to be made. Therefore, the group that is made of all probable interpretations of a trait of concern is the population under study, while a collected works of observations representing only a unit of that population is a sample (Denscombe, 2008). The study will target Chongwe Farmers.

3.4. Sampling design

Sampling refers to a procedure of selecting some members to be studied as they represent the large group from which they are selected (Oguia, 2005). Random sampling method was used to single out companies for the survey whereas purposive sampling will be used to select respondents who were to fill the questionnaires. It made it possible for all the enterprises in all the categories to stand equal chances of being incorporated in the sample (Singleton *et al.*, 1988). Random sampling entails subdividing the population into mutually exclusive parts called strata, based on the categories of one or a combination of relevant variables. From each stratum a simple random sample is then drawn and these sub samples are put together to form a complete stratified sample (Singleton *et al.*, 1988). In this study, both purposive and random sampling techniques were employed to strengthen the validity and reliability of the findings. Purposive sampling was used to deliberately select respondents who possessed specific knowledge and experience relevant to agricultural productivity and household food security, ensuring that critical insights from key informants were captured. At the same time, random sampling was applied to give all eligible participants an equal chance of selection, thereby reducing bias and enhancing the representativeness of the data. The combination of these approaches allowed the research to balance depth with breadth: purposive sampling provided targeted, context-rich information, while random sampling ensured that the results could be generalized to the wider population. This mixed approach was therefore instrumental in achieving both qualitative depth and quantitative severity.

3.5. Sample size determination

The participants for the study were drawn from Chongwe Farmers. However, the sample size of 50 informants.

3.6. Data collection

Instruments the data collection instruments which was used in this study are questionnaires, hence 50 questionnaires will be distributed to the respondents. The questionnaire will have both open and closed questions to collect data about the respondents and their views regarding the study problem. The use of questionnaire was chosen because it can reach a number of people relatively easily and economically and it provided quantifiable answers for a research topic. Hence primary data will be collected by means of questionnaires since they are inexpensive, practical and a quick way to offer to get results. The open-ended questions gave room for respondents to give unlimited opinions and the closed helped to get specific answers from respondents On the other hand secondary data will be collected from official documents and statistics available about the topic.

3.7. Data analysis

Kombo and Tromp (2006) define data analysis as the examination of the coded data critically and making inferences. In the study, data will be analyzed quantitatively. This was in accordance with Makondo (2002) facilitates going through the research question and questionnaire responses and coming up with common themes related to each of the questions. The responses from questionnaire were put into categories according to emerging themes. This allowed objectives and critical interpretations that helped in making decisions that were valid for proper conclusion and recommendation of the study. The quantitative data collected from closed ended questions was analyzed by the use of descriptive statistics in form of Percentages and frequencies. The Statistical Package for Social Sciences (SPSS) was used to enhance the analysis since it organizes and manages data, provides quicker and accurate data analysis and offers a wide range of graphs, methods and charts.

3.8. Triangulation

Triangulation is a technique used for analyzing the results from multiple-method research designs. It is most often used as a form of cross-checking to validate the results from different kinds of methods, such as of Zambia officials and the collection of demographics and other information. This study involved the use of the survey method, use of a structured questionnaire or interview guide in an interview, the use of a sample and the use of probability sampling technique to arrive at the sample. Data will be coded and thematically analyzed. The collection of data by the researcher identified the complexities related to the context of the study. The surveys were supplemented by the interviews and focus groups. Each research method exposed one aspect of reality.

3.9. Limitation of the study

The researcher may encounter problems such as distance, also respondents may have difficulty in understanding the

questionnaire's format not only that the researcher may also have problem in term of financial support to enable the researcher to go around in collecting data and because of the stated problems the researcher will have a small size of respondents as if that is not enough some of important information may not be disclosed from the respondents due to issue of confidentiality of information Rothamsted Research (2020). Integrating Advanced Technologies in UK Agriculture: Challenges and Barriers.

3.10. Ethical considerations

Ethical considerations will be taken into account in this study. All the data collected will be strictly be treated as confidential and not used for any purposes other than the intended one, also consent was sort from the respondents and the researcher ensured that the respondents voluntarily participate in this study and maintain an open and honest approach to the study, as if that is not enough names of the participants details will be protected and kept confidential, where the participant wished to withdraw, they were free to do so, not only that the researcher also got permission from the institutions in order to enable the researcher to collect data (Tavakoli & Ebrahimzadeh, 2019).

4. RESULTS AND DISCUSSION

The main objective of this study was to examine the Effect of Agricultural Productivity on Household Living Conditions: a case study of Chongwe farming block II. In this chapter, the researcher conducts a question-by-question analysis in order to fully explain and interpret all the responses associated with each question in the questionnaire.

Table 1. Age

		Frequency	Percent
Valid	18-24	9	18.0%
	24-30	16	32.0%
	30-45	20	40.0%
	50 above	5	10.0%
	Total	50	100.0%

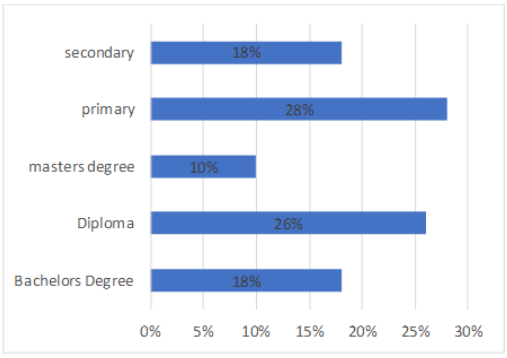

Figure 1. highest level of education

The study requested respondents to indicate highest level of education. 28% of the majority respondent indicated primary, 26% of the respondents indicated diploma, 18% of the respondent indicated secondary, 18% of the respondents indicated bachelors degree and 10% of the respondents indicated master degree.

4.1. Background information

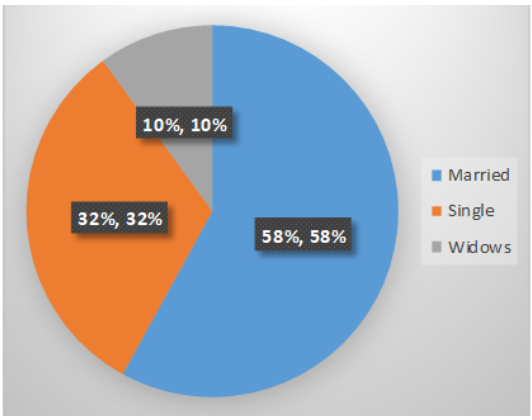

Figure 2. Marital status

The study requested respondents to indicate their marital status. 58% of the majority respondent indicated married, 32% of the respondents indicated single and 10% of the respondents indicated widows.

Table 2. What are the primary mechanisms through which agricultural productivity impact

		Frequency	Percent
Valid	Enhanced access to diverse and Nutritious Foods	13	26.0%
	Greater household Resilience to shocks	5	10.0%
	Improved Dietary Diversity and Nutritional intake	6	12.0%
	Increased income from Agricultural Sales	26	52.0%5
	Total	50	100.0%

4.2. Effects of agricultural productivity on household food security

The study requested respondents to indicate to what extent increased agricultural productivity correlates with improved household food security. 66% of the majority respondents indicated strongly positive correlation, 20% of the respondents indicated moderate positive, 8% of the respondents indicated no significant correlation and 6% of the respondents indicated

negative correlation.

The study sought to identify the primary mechanisms through which agricultural productivity impacts household food security. A majority of respondents (52%) indicated that increased income from agricultural sales was the most significant pathway, as households rely on selling produce to generate cash for food and other essential needs. Another 26% of respondents highlighted enhanced access to diverse and nutritious foods, suggesting that higher productivity directly improves the availability of varied crops and diets. Meanwhile, 12% of respondents pointed to improved dietary diversity and nutritional intake, emphasizing the role of productivity in reducing malnutrition and strengthening overall health. Finally, 10% of respondents noted greater household resilience to shocks, underscoring how productivity helps families withstand economic or climatic challenges. The study requested respondents to indicate the primary Mechanisms through which agricultural productivity impacts household food security.

The study requested respondents to indicate how socio-economic factors influence the relationship between agricultural productivity and household food security. 59% of the majority respondents indicated land ownership and tenure, 18% of the respondents indicated income level, 13% of the respondents indicated access to market infrastructure and 10% of the respondents indicated educations level.

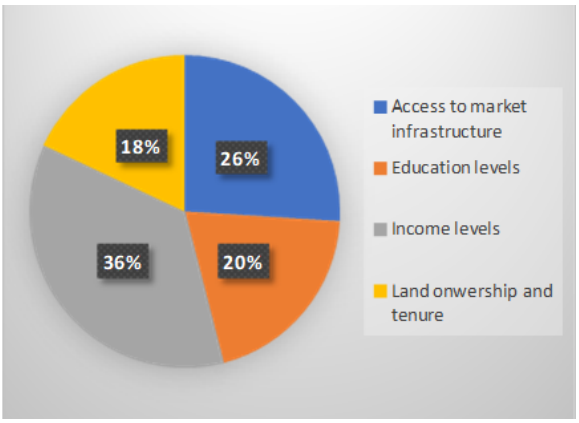

Figure 3. How do socio-economic factors influence the relationship between agricultural productivity and household food security

Table 3. How climate change affects the relationship between agricultural productivity and household food security

		Frequency	Percent
Valid	Adaption strategies and resilience-building measures	10	20.0%
	Changes in rainfall patterns and water variability	15	30.0%
	Effects on crop yield and agricultural practices	17	34.0%
	Increased frequency of extreme weather events	8	16.0%
	Total	50	100.0%

The study requested respondents to indicate how climate change affects the relationship between agricultural productivity and household food security. 34% of the majority respondents indicated effects on crop yield and agricultural practices, 30% of the majority respondents indicated changes in rainfall patterns and water viability, 20% of the respondents indicated Adaption strategies and resilience building measures and 16% of the respondents indicated increased frequency of extreme weather events.

4.3. Model 1

Table 4. Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.863	1	.863	3.566	.065b
	Residual	11.617	48	.242		
	Total	12.480	49			

a. Dependent Variable: agricultural productivity
b. Predictors: (Constant), household food security

Tables Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.000	.284		3.521	.001
	household food security	.277	.146	.263	1.888	.065

a. Dependent Variable: agricultural productivity

This table presents the results of a regression analysis where the dependents variable is agricultural productivity. Here's a breakdown of the information provided:

• *Constant:* The value is 1.000 with a standard error of 0.284. This means that when the independent variable (household food security) is zero, the agricultural productivity is expected to be 1.000 units.

• *Household food security:* The coefficient is 0.277 with a standard error of 0.146. This indicates that for each unit increase in household food security, agricultural productivity is expected to increase by 0.277 units.

• *Household food security:* The standardized coefficient (Beta) is 0.263. This is a measure of how many standard deviations agricultural productivity will change per standard deviation increase in household food security.

The t-value is 3.521 with a significance level (p-value) of 0.001. This indicates that the constant is statistically significant at the 0.1% level. The t-value is 1.888 with a significance level (p-value) of 0.065. This indicates that the relationship between household food security and agricultural productivity is marginally significant, commonly considered significant at the 10% level (but not at the 5% level).

The constant term (1.000) is statistically significant, suggesting that there is a base level of agricultural productivity that is independent of household food security.

The coefficient (0.277) for household food security suggests a positive relationship with agricultural productivity. For every unit increase in household food security, agricultural productivity increases by 0.277 units. However, the p-value (0.065) indicates that this result is only marginally significant, meaning there is some uncertainty about the strength and reliability of this relationship.

4.4. Effects of agricultural diversification and value addition to enhancing household living conditions

Table 5. How does agricultural diversification contribute to the improved household living conditions?

	Frequency	Percent
Enhanced food security through diverse agricultural products	13	26.0%
Expanded job opportunities within the household	8	16.0%
Higher overall standard of living through diverse agricultural activities	6	12.0%
Improved resilience to climate change and market fluctuations	8	16.0%
Increased income from diversified crops	15	30.0%
Total	50	100.0%

The study requested respondents to indicate how agricultural diversification contributes to improved household living conditions. 30% of the majority respondents indicated increased income from diversified crops, 26% of the respondent indicated enhanced food security through diverse agricultural products, 16% of the respondents indicated expanded job opportunities within the household, 16% of the respondents indicated climate change and market fluctuations and 12% of the respondents indicated higher overall standard of living through diverse agricultural activities.

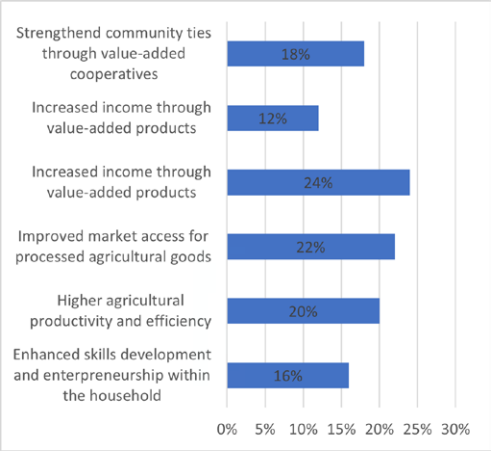

Figure 4.what are the socio-economic impacts of value addition in agriculture on household living conditions

The study requested respondent to indicate socio-economic impacts of value addition in agriculture on household living conditions. 24% of the majority respondent indicated increased income through value added products, 22% of the respondent indicated improve market access for processed agriculture goods, 20% of the respondent indicated higher agriculture productivity and 18% of the respondent indicated strengthen community ties through value added cooperatives, 16% of the respondent indicated enhanced skills development and entrepreneurship within the household and 12% of the respondent indicated increased income through value added products.

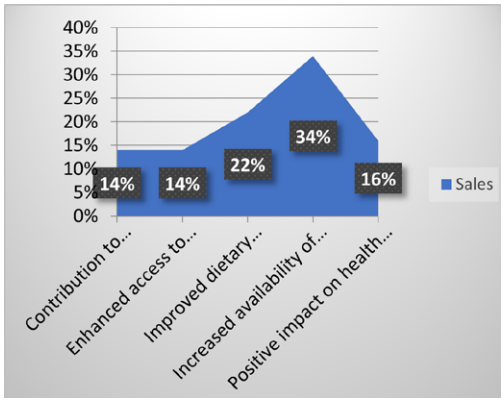

Figure 5. to what extent does agricultural diversification and value addition contribute to the nutritional well-being of households

The study requested respondent to indicate to what extent agricultural diversification and value addition contributes to the nutritional well-being of households. 34% of the majority respondent indicated Increased availability of nutritious crops and products, 22% of the respondent indicated Improved dietary diversity through diversified agriculture, 16% of the respondent indicated Contribution to addressing malnutrition issues in the community, 14% of the respondent indicated Enhanced access to locally processed and nutrients-rich foods and 14% of the respondent indicated Positive impact on health outcomes within the household.

Table 6. How policy interventions influences the success of agricultural diversification and value addition in enhancing household living condition

		Frequency	Percent
Valid	Financial support for small-scale farmers in value addition	6	12.0%
	Incentives for value -added processing units	6	12.0%
	Land-use policies encouraging diversification	12	24.0%
	Regulatory frameworks promoting sustainable agricultural practices	7	14.0%
	Supportive policies for the diversified crop cultivation	19	38.0%
	Total	50	100.0%

The study requested respondent to indicate how policy interventions influence the success of agricultural diversification and value addition in enhancing household living conditions. 38% of the majority respondent indicated Supportive policies for the diversified crop cultivation, 24% of the respondent indicated Land-use policies encouraging diversification, 14% of the respondent indicated Regulatory frameworks promoting sustainable agricultural practices, 12% of the respondent indicated Incentives for value -added processing units and 12% of the respondent indicated financial support for small-scale farmers in value addition.

The study requested respondent to indicate the challenges and barriers faced by households in adopting agricultural diversification and value addition strategies. 40% of the majority respondent indicated Limited access to processing facilities and technology, 32% of the respondent indicated Lack of knowledge and awareness about diversified crops, 18% of the respondent indicated Market-related challenges for diverse agricultural products, 6% of the respondent indicated financial constraints in implementing value addition initiatives and 4% of the respondent to indicated Cultural and social barriers affecting agricultural diversification efforts.

4.5. Hindrances faced by households in Chongwe Farming Block II concerning agricultural productivity

Figure 7. What are the primary agricultural productivity challenges faced by households in Chongwe Farming block II

		Frequency	Percent
Valid	Cultural and social barriers affecting agricultural diversification efforts	2	4.0%
	Financial constraints in implementing value addition initiatives	3	6.0%
	Lack of knowledge and awareness about diversified crops	16	32.0%
	Limited access to processing facilities and technology	20	40.0%
	Market-related challenges for diverse agricultural products	9	18.0%
	Total	50	100.0%

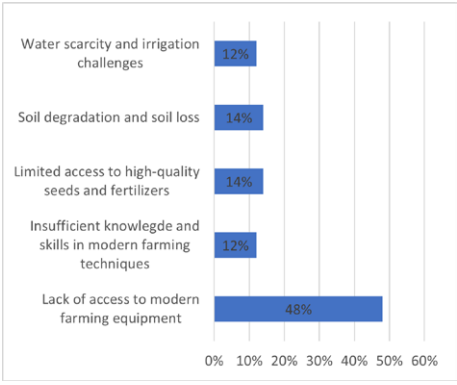

Figure 6. Primary agricultural productivity challenges.

The study requested respondent to indicate the primary agricultural productivity challenges faced by households in Chongwe Farming block II. 48% of the majority respondent indicated Lack of access to modern farming equipment, 14% of the respondent indicated Limited access to high-quality seeds and fertilizers, 14% of the respondent indicated Soil degradation and soil loss and 12% of the respondent indicated Insufficient knowledge and skills in modern farming techniques and 12% of the respondent Water scarcity and irrigation challenges.

The study requested respondents to indicate how socio-economic factors influence agricultural productivity in Chongwe farming block II households. 38% of the majority respondent indicated Income levels and access to financial

Table 8. how social economic factors influence agricultural productivity in Chongwe Farming block II Households.

		Frequency	Percent
Valid	Access to extension services and agricultural training programs	7	16.0%
	Education levels and agricultural knowledge among household members	13	26.0%
	Income levels and access to financial resources for agricultural inputs	19	38.0%
	Land ownership and land tenure systems	4	8.0%
	Participation in cooperative farming initiatives	6	12.0%
	Total	50	100.0%

resources for agricultural inputs, 26% of the respondent indicated Education levels and agricultural knowledge among household members, 16% of the respondent to indicated Access to extension services and agricultural training programs, 8% of the respondent indicated Land ownership and land tenure systems and 12% of the respondent indicated Participation in cooperative farming initiatives.

environmental factors play in impacting agricultural productivity in Chongwe farming Block II. 30% of the majority respondent indicated soil erosion and land degradation, 30% of the respondent indicated climate variability and changing weather patterns, 18% of the respondent indicated pest and disease outbreaks affecting crops and livestock, 12% of the respondent indicated availability of water resources for irrigation and livestock and 10% of the respondent indicated access to suitable land for farming and grazing.

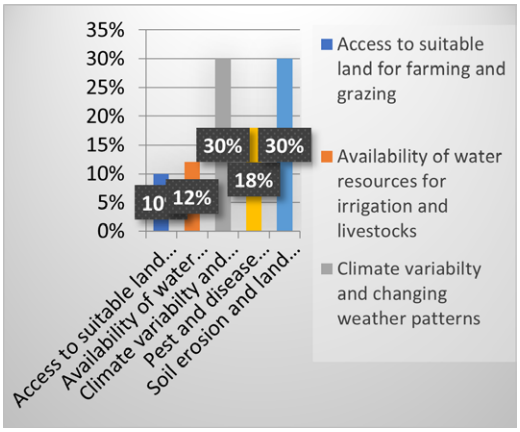

Figure 7. what role do environmental factors play in impacting agricultural productivity in Chongwe farming Block II

Table 9. How institutional factors influence agricultural productivity in Chongwe farming Block II

		Frequency	Percent
Valid	Access to markets and transportation infrastructure	13	26.0%5
	Availability of agricultural extension services and support networks.	7	14.0%
	Government policies and agricultural development programs.	16	32.0%
	Presence of agricultural cooperatives and farmer associations.	8	16.0%
	Regulatory frameworks governing land use and agricultural practices.	6	12.0%
	Total	50	100.0%

The study requested respondent to indicate how institutional factors influence agricultural productivity in Chongwe Farming Block II. 32% of the majority respondent indicated Government policies and agricultural development programs, 26% of the respondent indicated Access to markets and transportation infrastructure, 16% of the respondent indicated Presence of agricultural cooperatives and farmer associations, 14% of the respondent indicated Availability of agricultural extension services and support networks and 12% of the respondent indicated Regulatory frameworks governing land use and agricultural practices.

4.6. Discussion

4.6.1. Effects of agricultural productivity on household food security

The study's findings reveal a compelling connection between increased agricultural productivity and enhanced household food security. A significant majority, 66%, of respondents identified a strongly positive correlation, indicating that as agricultural productivity rises, households experience markedly better food security," underscores the fundamental relationship between agricultural output and food security. Numerous studies and empirical evidence support this assertion, emphasizing the critical role of agricultural productivity in guaranteeing consistent access to sufficient, safe, and nutritious food for families.

One of the primary reasons behind the strong correlation between agricultural productivity and food security lies in the direct impact of agricultural output on food availability. As agricultural productivity increases, the quantity of food produced rises, contributing to enhanced food availability within communities. This aspect is highlighted in a study conducted by the Food and Agriculture Organization (FAO), which found that improvements in agricultural productivity

led to increased food availability, subsequently reducing food insecurity levels (FAO, 2019). Moreover, higher agricultural productivity often translates to surplus production, which can be stored and utilized during times of scarcity or emergencies, further bolstering food security (World Bank, 2019).

Furthermore, 20% of respondents observed a moderate positive correlation, reinforcing the notion that increased productivity generally enhances food security, albeit to a lesser extent. Conversely, 8% of respondents saw no significant correlation, implying that other factors might be at play in those instances, such as market access or economic policies. A small minority, 6%, indicated a negative correlation, possibly pointing to issues like environmental degradation or resource depletion that could accompany intensified agricultural practices. Overall, the data underscores the crucial role of agricultural productivity in bolstering food security, while also highlighting the need to consider varied and nuanced impacts in different contexts.

A significant majority of respondents, it was revealed that 52% of households surveyed identified increased income from agricultural sales as the primary mechanism for improving their food security. This finding underscores the critical role of agricultural productivity in bolstering household economies and ensuring access to an adequate and diverse diet. Agricultural productivity refers to the efficiency of agricultural production, including factors such as crop yield per unit of land and livestock output per animal. When agricultural productivity increases, it leads to higher incomes for farmers, which, in turn, has profound implications for household food security.

Furthermore, the sustainability of agricultural productivity gains is paramount for long-term food security. Intensive farming practices, if not managed carefully, can lead to soil degradation, water pollution, and biodiversity loss, undermining the capacity of ecosystems to support agriculture in the future. Therefore, investments in sustainable agriculture, including agro-ecological approaches and conservation agriculture, are essential for maintaining productivity while safeguarding natural resources and ecological resilience.

Additionally, 26% of respondents indicated that agricultural productivity leads to enhanced access to diverse and nutritious foods. This implies that higher productivity not only boosts income but also increases the availability of a variety of food products, thereby improving nutritional outcomes. Furthermore, 12% of respondents noted that improved dietary diversity and nutritional intake are direct benefits of heightened agricultural productivity, highlighting the role of diverse crops in promoting better health and nutrition. Lastly, 10% of respondents pointed to greater household resilience to shocks as a critical outcome. This underscores the importance of agricultural productivity in providing households with the stability and resources needed to withstand economic or environmental disruptions, thereby maintaining food security in times of crisis. These findings collectively underscore the multifaceted benefits of agricultural productivity in enhancing household food security through economic, nutritional, and resilience pathways.

As evidenced by a survey where 59% of respondents underscored its paramount importance, secure land rights serve as a catalyst for agricultural development (Deininger & Jin, 2006). This acknowledgment reflects a broader understanding of how stable land tenure fosters an environment conducive to sustainable farming practices and technological advancements, thereby augmenting agricultural output and ensuring food availability. 34%, highlighted that climate change predominantly affects crop yields and agricultural practices. This suggests that respondents perceive a direct link between climate-induced variations in farming conditions and their ability to produce sufficient food. Another 30% pointed to changes in rainfall patterns and water availability as critical factors, indicating a recognition of how altered precipitation and water scarcity can disrupt traditional farming cycles and reduce crop output. Additionally20% of the respondents underscored the significance of adaptation strategies and resilience-building measures. This statistic is indicative of a growing awareness among stakeholders of the urgent need to address the challenges posed by climate change through proactive measures and innovative approaches. The recognition of adaptation and resilience-building as essential components in combating the adverse effects of climate change on agriculture and food security is rooted in scientific research and practical experiences from around the world.

A substantial 30% of the respondents highlighted that increased income from diversified crops is a primary advantage, indicating that engaging in a variety of agricultural activities allows households to earn more by selling different products. Enhanced food security was noted by 26% of the respondents, reflecting the idea that growing a range of crops can ensure a more stable and varied food supply, thereby reducing dependency on single crops and the risk of food shortages. Additionally, 16% of the respondents pointed out that agricultural diversification leads to expanded job opportunities within the household, suggesting that a more varied agricultural practice requires more labor, thus creating employment opportunities for household members. Another 16% of respondents acknowledged the role of diversification in mitigating the impacts of climate change and market fluctuations, emphasizing that having multiple types of crops or livestock can spread risk and provide a buffer against environmental and economic uncertainties. Finally, 12% of the respondents indicated that diversified agricultural activities contribute to a higher overall standard of living, suggesting that the combined benefits of increased income, food security, job opportunities, and resilience lead to improved quality of life for households engaged in diverse agricultural practices.

48% of the respondents is the lack of access to modern farming equipment. This indicates a significant barrier to efficiency and productivity in agricultural activities, as modern equipment plays a crucial role in optimizing processes and increasing yields. Following closely, 14% of the respondents identified limited access to high-quality seeds and fertilizers as a major challenge. This finding underscores the importance of access to inputs of good quality, which directly influences crop yields and overall agricultural productivity.

Another notable concern, also mentioned by 14% of the respondents, is soil degradation and soil loss. This highlights the environmental challenges faced by farmers in the area, which can lead to reduced fertility and productivity of land over time if not addressed adequately. Furthermore, 12% of the respondents expressed concerns about insufficient knowledge and skills in modern farming techniques. This indicates a need

for educational and capacity-building interventions to equip farmers with the necessary expertise to adopt more efficient and sustainable farming practices. Finally, an equal percentage of respondents, 12%, identified water scarcity and irrigation challenges as significant hurdles. This finding emphasizes the importance of water management strategies and infrastructure development to ensure reliable access to water for agricultural purposes, especially in regions prone to water scarcity.

5. CONCLUSION

The findings from the study provide a comprehensive understanding of the effects of agricultural productivity on household food security in Chongwe Farming Block II. The data overwhelmingly suggests a positive correlation between increased agricultural productivity and improved household food security. This is primarily result to increased income from agricultural sales, enhanced access to diverse and nutritious foods, improved dietary diversity and nutritional intake, and greater household resilience to shocks. Specifically, the study highlights the significant role of land ownership and tenure, income levels, access to markets, and education in influencing household food security. Secure land rights, stable income, efficient market access, and agricultural knowledge are identified as critical factors that contribute to improved food security outcomes. Furthermore, the findings underscore the importance of supportive policies, land-use regulations, and investment in infrastructure and technology to enhance agricultural productivity and ensure food security for households in the region. However, the study also points out certain challenges and barriers faced by households in Chongwe Farming Block II concerning agricultural productivity. Limited access to modern farming equipment, high-quality inputs, and adequate knowledge and skills in modern farming techniques are identified as significant hindrances. Additionally, environmental challenges such as soil degradation, climate variability, and pest and disease outbreaks pose threats to agricultural productivity and food security in the region. Overall, the findings highlight the complex interplay between various socio-economic and environmental factors in shaping agricultural productivity and household food security in Chongwe Farming Block II.

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