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Examining the Effects of Agricultural Productivity on Household Living Conditions: A Case Study on Small Scale Farms in Chongwe District

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Abstract

This study examined the effects of agricultural productivity on household living conditions among small-scale farmers in Chongwe District. Specifically, it assessed the effect of agricultural productivity on household income, examined its relationship with household food security, and analyzed its influence on access to basic social services such as education and health. The study adopted a descriptive survey research design complemented by a mixed-methods approach. A sample of 180 small-scale farming households was selected using purposive and stratified random sampling. Data were collected through structured questionnaires and semi-structured interviews and analyzed using frequencies, percentages and thematic analysis in MegaStat. The study found that agricultural productivity improved household income, with 40.0% reporting higher production and 35.0% indicating that increased production contributed to household income to a large extent. The findings further showed that improved household food security, with 40.0% reporting that 50–74% of household food requirements were met through own production, while 60.0% reported never experiencing food shortages. The study also found that agricultural productivity improved access to social services, with 40.0% reporting a positive overall effect and 25.0% a very positive effect. The study recommends strengthening agricultural extension services, improving access to affordable inputs and credit, expanding market and storage infrastructure, promoting crop diversification and climate smart agriculture, and integrate agricultural programmes with education and health initiatives. The study further recommends similar research in other districts using larger samples and diverse approaches.

Keywords: Agricultural Productivity, Small-Scale Farmers, Household Living Conditions, Household Income, Food Security, Access to Social Services, Education and Health

1. Introduction

1.1 Background of Study

Agriculture is the cornerstone of Zambia's economy, employing over 70% of the rural population and contributing significantly to food security and national development (Sitko, 2020). The sector is dominated by small-scale farmers who cultivate small landholdings, primarily for subsistence, with limited surplus marketed. These farmers play a crucial role in ensuring household food availability, generating income, and sustaining rural livelihoods. In districts such as Chongwe, where the majority of households depend on small-scale agriculture, productivity levels are directly linked to welfare outcomes such as nutrition, health, education, and housing. Agricultural productivity refers to the efficiency with which inputs such as land, labor, and capital are transformed into outputs like crops and livestock products.

Higher productivity has been associated with increased household income, enhanced food security, and the ability of families to access essential social services (FAO, 2020) [8]. Conversely, low productivity is often correlated with persistent poverty, food insecurity, and limited opportunities for rural households to improve their living standards (World Bank, 2019) [35]. In Zambia, the government has implemented several programmes such as the Farmer Input Support Program (FISP) and the Food Reserve Agency (FRA) to enhance smallholder productivity and stabilize rural incomes. Despite these initiatives, small-scale farmers continue to face constraints, including inadequate access to inputs, low adoption of modern technologies, poor infrastructure, limited market access, and the adverse impacts of climate change (Zulu-Mbata, 2021). These challenges have kept productivity levels low, limiting the expected improvement in household living conditions.

Agriculture plays a pivotal role in the economies of developing countries, particularly in sub-Saharan Africa, where the

majority of the population resides in rural areas and depends on farming for survival. Globally, agriculture is not only a source of food but also a driver of economic growth, poverty reduction, and improved living standards when productivity increases (FAO, 2020) [8]. Evidence shows that agricultural growth has a stronger effect on poverty reduction compared to growth in other sectors because it directly influences rural households' income, food security, and welfare (World Bank, 2019) [35].

In Zambia, agriculture remains the second most important sector after mining, contributing approximately 19–20% to Gross Domestic Product (GDP) and providing employment for over 70% of the population (Sitko *et al*. 2019). The sector is dominated by small-scale farmers who cultivate plots typically less than five hectares, often with low mechanization and heavy reliance on rain-fed systems. These farmers are central to the country's food security as they produce the bulk of staple crops such as maize, groundnuts, beans, and cassava (Mason & Myers, 2020). Agricultural productivity, therefore, has direct implications for household welfare and the broader development agenda.

Over the past two decades, the Zambian government has introduced policies and programmes such as the Farmer Input Support Program (FISP), the Food Reserve Agency (FRA), and the Agricultural Credit Schemes to promote agricultural productivity among small-scale farmers. These interventions aim to improve yields, stabilize rural incomes, and reduce poverty. However, challenges such as climate variability, high input costs, limited access to credit, inadequate extension services, and poor rural infrastructure continue to undermine productivity levels (Zulu-Mbata, 2021). As a result, many smallholder households remain trapped in cycles of poverty, unable to translate farming activities into sustainable livelihoods.

Chongwe District, located in Lusaka Province, is one of the areas where small-scale farming is the backbone of household livelihoods. The district's population is predominantly rural, with agriculture being the mainstay of economic activity. Households in Chongwe cultivate a range of crops, including maize, groundnuts, vegetables, and beans, while also engaging in small-scale livestock rearing. Despite the agricultural potential of the district, productivity levels remain low due to limited access to improved seed varieties, reliance on traditional farming methods, and the increasing impacts of erratic rainfall patterns linked to climate change.

1.2 Statement of the Problem

Despite agriculture being the main source of livelihood for the majority of households in Zambia, small-scale farmers in Chongwe District continue to experience low productivity levels that undermine improvements in their living conditions. Although the district's proximity to Lusaka provides ready markets for fresh produce, persistent challenges such as limited access to affordable credit, low adoption of improved seed and fertilizer, inadequate irrigation facilities, and weak extension services constrain output (IGC, 2024; World Bank, 2024 [36]). Moreover, environmental shocks such as droughts and erratic rainfall patterns further exacerbate yield fluctuations, leaving households vulnerable to food insecurity and income instability (Ngoma, 2021). As a result, many households remain trapped in cycles of poverty, unable to accumulate assets, invest in education and health, or improve their housing standards. While previous studies acknowledge the general importance of agricultural productivity to household welfare in Zambia, there is insufficient empirical focus on the specific linkages between productivity and household living conditions in peri-urban districts like Chongwe, where farming systems face both opportunities and constraints. This knowledge gap limits the formulation of context-specific interventions capable of enhancing household well-being through agricultural transformation. Therefore, it is necessary to examine how agricultural productivity influences household living conditions in Chongwe District and to identify policy options that can help small-scale farmers translate productivity gains into sustainable improvements in welfare.

1.3 General Objective

To examine the effects of agricultural productivity on household living conditions among small-scale farmers in Chongwe District.

1.3.1 Specific Objectives

1. To assess the effect of agricultural productivity on household income among small-scale farmers in Chongwe District.
2. To examine the relationship between agricultural productivity and household food security in the study area.
3. To analyze how agricultural productivity influences access to basic social services such as education and health within farming households.

1.4 Research Questions

1. What is the effect of agricultural productivity on household income among small-scale farmers in Chongwe District?
2. How does agricultural productivity influence household food security in the study area?
3. In what ways does agricultural productivity affect access to social services such as education and health within farming households?

1.5 Theoretical Framework

This study is guided by the Sustainable Livelihoods Framework (SLF), developed by the UK Department for International Development (DFID) and widely used in rural development and agricultural research (Scoones 2021). The framework explains that household livelihoods are determined by access to five key livelihood assets: human capital (knowledge, skills, labor and health), natural capital (land, water and other natural resources), financial capital (income, savings and credit), physical capital (infrastructure, equipment and technology), and social capital (networks, relationships and community support) (Kuteya *et al*. 2022) [12]. The interaction of these assets enables households to pursue productive livelihood strategies that improve their well-being and resilience. The framework has remained relevant in contemporary studies because it provides a holistic understanding of how agricultural productivity contributes to sustainable livelihood outcomes and improved household welfare (Hichaambwa *et al*. 2023) [9].

The Sustainable Livelihoods Framework is appropriate for this study because it explains how increased agricultural productivity enhances household living conditions among small-scale farmers in Chongwe District (Ngoma *et al*. 2023) [24]. Improved productivity increases farm output and

household income, thereby supporting the first objective of assessing the effect of agricultural productivity on household income. Higher production also improves food availability and access, which aligns with the second objective of examining the relationship between agricultural productivity and household food security. Furthermore, increased income enables households to invest in education and healthcare, supporting the third objective of analyzing how agricultural productivity influences access to basic social services. Therefore, the framework provides a suitable theoretical foundation for understanding the relationship between agricultural productivity and household living conditions in the study area.

1.6 Significance of the Study

This study was significant as it provided a comprehensive understanding of how agricultural productivity impacted household living conditions among small-scale farmers in Chongwe District. The findings informed policymakers and development agencies on the critical link between farm output and household welfare, thereby guiding the formulation of targeted agricultural policies and support programmes. The improved knowledge of productivity constraints and opportunities facilitated interventions aimed at enhancing food security, income generation and the overall quality of life for rural households (Chirwa, 2019; Tembo & Sitko, 2021). The study also contributed to the academic discourse on rural development by offering empirical evidence from a specific Zambian context, which can be referenced in future research on smallholder farming systems and livelihood improvement. Furthermore, it provided practical insights for extension officers, non-governmental organisations and local authorities in designing capacity-building initiatives, improving access to inputs and promoting the adoption of modern farming techniques.

2. Litereture Review

2.1 Agricultural Productivity and Household Income

Abdulai and Abdul-Rahman (2022) [1] in northern Ghana examined the relationship between agricultural productivity and household income among smallholder maize farmers. The research employed a quantitative cross-sectional research design using structured questionnaires administered to 420 randomly selected farming households through multistage sampling. Data were analyzed using descriptive statistics and multiple regression analysis to determine the contribution of productivity to household earnings. The findings revealed that increased crop productivity significantly enhanced household income through higher marketable surplus and improved farm profitability. The study concluded that investments in productivity enhancing technologies, extension services and improved seed varieties are essential for raising rural household incomes in Ghana.

In Nigeria, Adebayo *et al*. (2023) [2] investigated the effect of agricultural productivity on rural household income among smallholder crop farmers in Oyo and Ogun States. The study adopted a descriptive survey design with a quantitative approach involving 360 households selected through multistage sampling techniques. Primary data were collected using structured questionnaires and analyzed using ordinary least squares regression and descriptive statistics. The results indicated that households with higher crop yields realized significantly greater annual incomes than those with lower productivity levels. Access to extension services, fertilizer use and improved farm management practices were identified as major determinants of productivity. The study concluded that strengthening agricultural support programmes can substantially improve rural household welfare and income generation.

A study by Mudenda *et al*. (2023) [20] investigated the factors affecting agricultural productivity among smallholder farmers in selected districts of Central and Lusaka Provinces, Zambia. The research adopted a mixed-methods research design, employing cluster sampling to select 112 smallholder farmers from three villages. Data were analyzed using descriptive statistics and factor analysis. The findings revealed that inadequate access to land, limited agricultural extension services, poor financial inclusion, dependence on rain-fed agriculture, and insufficient government support significantly reduced agricultural productivity, thereby limiting household income. The study concluded that improving access to productive resources and extension services is essential for enhancing agricultural productivity and increasing rural household incomes.

Silva *et al*. (2023) [33] examined maize productivity and its implications for household welfare across smallholder farming systems in Zambia. The research utilized a quantitative research design based on a nationally representative household survey conducted over three agricultural seasons, complemented by crop simulation modelling. Households were selected using probability Sampling techniques to ensure national representation. The study established that substantial maize yield gaps persisted because of low fertilizer use and inadequate agronomic practices. Closing these productivity gaps was found to substantially improve farm output, food availability and household incomes. The authors concluded that productivity-enhancing interventions targeted according to farmer typologies would generate greater income gains among rural households.

2.2 Agricultural Productivity and Household Food Security

In India, Kumar *et al*. (2022) assert that agricultural productivity remains a fundamental determinant of household food security, particularly among smallholder farming communities. Their study employed a quantitative cross-sectional research design using structured household questionnaires administered to 1,248 farming households selected through a multistage random sampling technique across three agricultural states. Data were analyzed using logistic regression and descriptive statistics to establish the relationship between farm productivity and food security indicators. The findings demonstrated that households with higher crop yields experienced greater dietary diversity, improved food availability and reduced vulnerability to seasonal food shortages. The study concludes that enhancing agricultural productivity through improved technologies and extension services significantly strengthens household food security in rural India.

In Bangladesh, Rahman and Hasan (2023) [29] contend that increasing agricultural productivity contributes substantially to improving household food security despite persistent climate-related challenges. The study employed a mixed-methods cross-sectional design involving 600 rural households selected through stratified random sampling

from flood-prone districts. Quantitative data were analyzed using multiple regression while qualitative interviews complemented statistical findings. The results revealed that households adopting improved rice varieties and modern farming practices achieved significantly higher food consumption scores than non-adopters. Furthermore, agricultural productivity enhanced household resilience against food insecurity during climatic shocks. The authors conclude that sustainable agricultural innovations remain essential for strengthening food security among vulnerable farming populations in Bangladesh (Rahman & Hasan, 2023) [29].

In Zimbabwe, Mujeyi *et al*. (2021) [21] contend that climate-smart agricultural practices positively influence agricultural productivity and household food security among smallholder farmers. The study adopted a quantitative research design using nationally representative survey data from integrated crop-livestock farming households, with propensity score matching applied to estimate treatment effects. Farmers were selected through structured survey sampling covering several districts in Zimbabwe. The findings demonstrate that households adopting climate-smart agriculture realized higher crop productivity, increased farm income and improved food consumption than non-adopters. The authors conclude that expanding climate-smart agricultural technologies would strengthen household resilience and food security under changing climatic conditions.

Mango *et al*. (2022) [18] argue that agricultural productivity directly shapes household food security in rural communities. The research was undertaken in Gurué District using a longitudinal panel research design involving two rounds of household surveys conducted during 2020 and 2021. A statistically determined sample of 296 agriculture-based households was selected through probability sampling procedures. The study maintains that households with greater crop productivity, improved market participation and diversified agricultural production experienced significantly better food security outcomes than households with lower productivity. The research concluded that investments in agricultural extension services, market access and productivity-enhancing technologies are indispensable for sustaining household food security in rural Mozambique.

In Malawi Snapp *et al*. (2018) [34] proposes that increasing agricultural productivity through crop diversification substantially improves household food security among smallholder farmers. The study employed a quantitative cross-sectional research design using structured household questionnaires administered to a stratified random sample of 271 farming households across four districts in central Malawi. Econometric analysis revealed that diversified production systems significantly increased food availability and reduced household food insecurity compared with mono-cropping systems. The research concluded that policies promoting crop diversification and sustainable farming practices are likely to strengthen agricultural productivity while improving long-term household food security among smallholder farmers in Malawi.

Phiri and Chibomba (2024) demonstrate that agricultural productivity is a critical determinant of household food security among smallholder farming households in Chisamba District, Zambia. The research employed a mixed-methods approach using a descriptive research design, combining structured questionnaires with focus group discussions. A sample of 50 farmers was selected to generate both qualitative and quantitative data. The findings revealed that increased agricultural productivity enhanced household food consumption, improved dietary quality, and encouraged investments in farm infrastructure and livestock. The study further asserts that higher agricultural output strengthens household resilience against food shortages and contributes significantly to sustainable livelihoods, thereby reinforcing the relationship between productivity and food security.

Nkomoki *et al*. (2019) [27] argue that household food security in Southern Province of Zambia, particularly in Choma, Kalomo, Mazabuka and Chikankata districts, is strongly influenced by agricultural productivity and access to productive resources. The study adopted a cross-sectional survey design involving 400 randomly selected smallholder households supported by qualitative interviews with government officials and community leaders. Using ordered probit regression analysis, the researchers established that larger cultivated land, livestock ownership, secure land tenure, education and farmer group membership significantly improved household food security. The authors maintain that increasing agricultural productivity through institutional and resource-based interventions remains fundamental to achieving sustainable household food security in rural Zambia (Nkomoki *et al*. 2019) [27].

2.3 Agricultural Productivity and Access to Social Services

In Bangladesh, Rahman *et al*. (2023) [30] examined the relationship between agricultural productivity and rural households' access to social services. The study employed a quantitative research approach using a cross-sectional survey design involving 1,245 smallholder farming households selected through multistage random sampling across six agricultural districts. Data were analyzed using multiple regression and propensity score matching techniques. The findings revealed that households with higher agricultural productivity recorded significantly improved access to education, healthcare, safe drinking water and sanitation services due to increased household incomes. The study further established that productivity growth enhanced household investments in children's education and health expenditures. The research concluded that improving agricultural productivity is an effective pathway for strengthening rural access to essential social services in Bangladesh.

In India, Kumar and Singh (2022) investigated how agricultural productivity influences rural welfare and access to basic social services among farming communities. The study adopted a mixed-methods approach using a descriptive survey research design. A sample of 820 farming households was selected through stratified random sampling from four agriculturally productive states. Quantitative data were analyzed using panel regression models, while qualitative responses were analyzed thematically. The study found that increased crop productivity significantly improved household income, enabling families to afford better healthcare, education and improved housing facilities. However, regional disparities in public service delivery continued to limit equal access among remote farming communities. The study concluded that productivity-enhancing agricultural policies should be complemented by equitable investments in rural social infrastructure.

Mutenje *et al*. (2023) [22] investigated the relationship between climate-smart agricultural productivity and household welfare in Zambia and Malawi. The research applied a cross-sectional mixed-methods design, collecting quantitative and qualitative data from 640 smallholder farmers selected through multistage sampling procedures. Econometric models and focus group discussions were used to analyses the data. The study found that adoption of climate-smart agricultural practices significantly increased farm productivity, which translated into improved household income, better healthcare utilization, school attendance, and enhanced food security. The authors concluded that climate-smart agriculture serves as an effective strategy for simultaneously improving agricultural productivity and expanding access to social services across rural communities.

In South Africa, Mahlobo *et al*. (2024) [14] examined the association between agricultural productivity, household welfare, and access to public services among emerging farmers. The study employed a descriptive cross-sectional research design using structured questionnaires administered through a stratified random sampling technique to 420 farming households. Data were analyzed using descriptive statistics and multiple linear regression analysis. The findings showed that farmers with higher productivity levels were better able to access healthcare, quality education, clean water, and financial services than their less productive counterparts. The researchers concluded that improving agricultural productivity should remain a policy priority because it directly contributes to enhanced social wellbeing and equitable access to essential social services in rural South Africa.

Phiri and Chibomba (2025) [28] in Chisamba District examined how agricultural productivity affects household living conditions using a mixed-methods case study design. The research employed structured questionnaires and interviews among 120 smallholder farming households selected through simple random and purposive sampling. The findings revealed that households with higher agricultural productivity experienced increased household incomes, enabling greater expenditure on school fees, medical care, improved nutrition and better housing. The study concluded that improving agricultural productivity contributes significantly to enhanced access to social services and improved household welfare in rural Zambia.

Ngoma *et al*. (2021) [23] investigated whether the Farmer Input Support Program (FISP) contributes to agricultural productivity and welfare among smallholder farmers in Zambia. The researchers applied a quantitative panel research design using data from the Rural Agricultural Livelihoods Survey, covering over 4,000 farm plots collected in 2012 and 2015 through multi-stage sampling. Using econometric panel data analysis, the study established that access to subsidized agricultural inputs increased maize productivity, although benefits differed between male- and female-managed farms. Higher agricultural output translated into improved household income, thereby strengthening families' capacity to access education, healthcare and other essential social services. The authors concluded that productivity programmes should be complemented by broader rural development interventions to maximize social welfare.

Mason *et al*. (2022) [19] assessed the impact of the Farmer Input Support Program on agricultural production diversity and household welfare across Zambia. The study adopted a quantitative impact evaluation design using nationally representative household survey data collected from thousands of smallholder farmers through multi-stage probability sampling. Econometric estimation techniques showed that participation in FISP significantly increased crop diversification, agricultural income and farm enterprise diversity. Increased farm productivity improved household earnings, enabling families to invest more in children's education, health services and other basic social needs. The researchers concluded that agricultural productivity programmes play an important role in improving rural livelihoods, although complementary nutrition and social service interventions remain necessary.

3. Research Methodology

3.1 Research Design

The study adopted a descriptive survey research design, complemented by elements of a mixed-methods approach. The descriptive survey design was appropriate because it enabled the researcher to systematically collect data from a representative sample of small-scale farming households in Chongwe District in order to describe the current state of agricultural productivity and its implications for household living conditions. According to Creswell (2021), survey designs are useful for obtaining both quantitative and qualitative data, allowing researchers to analyses relationships between variables and generalize findings to a larger population. The mixed-methods approach combined both quantitative and qualitative techniques. Quantitative methods generated measurable data on variables such as crop yields, household income and food security levels, while qualitative methods provided in-depth insights into farmers' experiences, challenges and coping strategies. This design was suitable for the study because it ensured triangulation, enhanced the validity of findings and provided a holistic understanding of the research problem (Kothari, 2019).

3.2 Target Population

The target population for this study comprised small-scale farming households in Chongwe District, Lusaka Province. These households were selected because they directly depended on agricultural productivity for both subsistence and income generation. According to district agricultural profiles, small-scale farmers formed the majority of the agricultural sector in Chongwe, contributing significantly to household livelihoods and food security (Zambia Ministry of Agriculture, 2021).

3.3 Sampling Design

This study employed a purposive and stratified random sampling design. Purposive sampling was used to specifically target small-scale farming households in Chongwe District, as they represented the core focus of the research (Etikan, Musa & Alkassim, 2019). This approach allowed the researcher to select participants who had direct experience and knowledge of agricultural productivity challenges, ensuring that the data collected was relevant and meaningful (Palinkas *et al*., 2021). Within this targeted group, stratified random sampling was applied to ensure that households were proportionately selected from different agricultural camps and villages within the district. Stratification was particularly important because agricultural

productivity and household living conditions varied depending on location, access to markets and availability of farming inputs (Creswell & Creswell, 2022). By dividing the population into strata based on geographical and socio-economic factors, the researcher captured diverse experiences and enhanced the representativeness of the sample (Taherdoost, 2021).

3.4 Sample Size Determination

Determining an appropriate sample size was vital for ensuring the reliability, validity and representativeness of the study's findings. The sampling frame for this research was drawn from the official registers maintained by the Ministry of Agriculture and agricultural cooperatives operating in Chongwe District. These institutions kept accurate and up to date records of small-scale farming households and cooperative members, thereby providing a credible basis for sample selection and enhancing the accuracy of population representation (Ministry of Agriculture, 2025).

Given the total number of registered small-scale farming households within the district and considering logistical, financial and time constraints, the study adopted a sample size of 180 households. This sample size was considered adequate for producing statistically meaningful results while maintaining feasibility in data collection. The selection process involved compiling a comprehensive list of eligible households from the Ministry and cooperative registers. A stratified random sampling technique was then used to ensure proportional representation across key strata such as ward, cooperative membership and primary crop type. Within each stratum, participants were randomly selected until the desired sample size was reached.

3.5 Data Collection Methods

This study used a mixed-methods approach, combining both primary and secondary data collection methods. Primary data were gathered through structured questionnaires and semi-structured interviews with selected small-scale farming households in Chongwe District.

The questionnaires captured quantitative information on agricultural productivity, access to inputs, market participation and household income, while the interviews provided qualitative insights into farmers' experiences, challenges and perceptions regarding productivity. Secondary data were collected from government reports, district agricultural profiles, extension records and published literature to provide contextual information, trends and background on policy interventions.

Data collection commenced after obtaining permission from local authorities and community leaders, with respondents being informed about the study's purpose and assured of confidentiality and voluntary participation. Questionnaires were administered in person to ensure clarity and high response rates, while interviews were recorded for accurate transcription and analysis. The combination of quantitative and qualitative methods allowed for a comprehensive understanding of both measurable outcomes and the lived experiences of small-scale farmers (Creswell & Creswell, 2019).

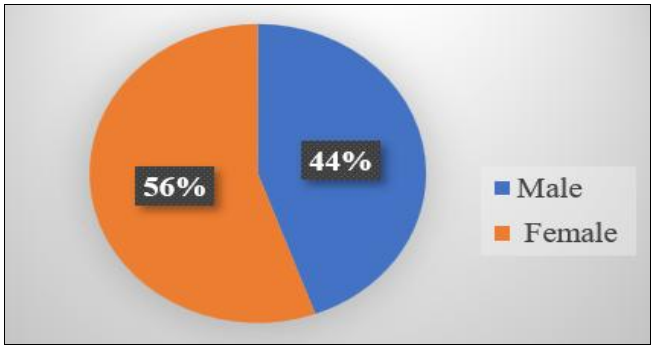
3.6 Data Analysis Methods

The data collected in this study were analyzed using both quantitative and qualitative techniques. Quantitative data from the questionnaires were cleaned, coded and entered into Megastat software for analysis. Descriptive statistics such as frequencies and percentages were used to summarize the data. Qualitative data from interviews were transcribed and analyzed thematically, identifying key patterns, recurring themes and insights into farmers' experiences and challenges. The combination of quantitative and qualitative analysis allowed for triangulation, enhancing the reliability and validity of the study findings (Flick, 2021). Results were presented using tables, charts and narrative explanations to provide a clear and comprehensive understanding of the factors affecting small-scale agricultural productivity in Chongwe District.

4. Reseacrch Findings and Discussions of Results

4.1 Demographic Characteristics of the Respondents

4.1.1 Gender of Respondents

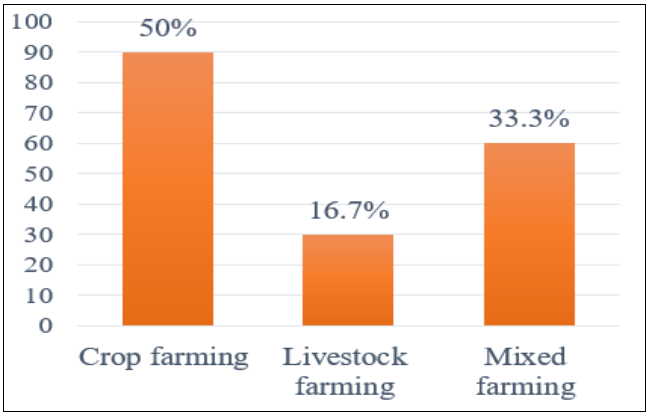


Source: Primary data, 2025

Fig 4.1: Gender of Respondents

Fig 4.1 above presents the distribution of respondents according to gender. The results show that 80 (44%) were male while 100 (56%) were female. This indicates that the study was slightly female-dominated, with women constituting the majority of the sample. The higher number of female participants may be attributed to their greater availability or willingness to participate in the study during the data collection period.

4.1.2 Types of Farming Practiced



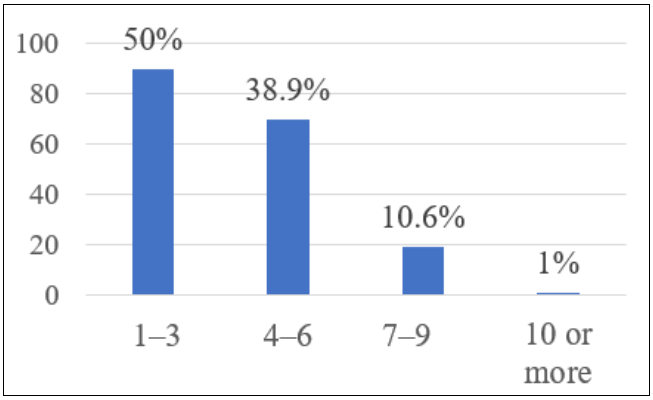
Source: Primary data, 2025

Fig 4.2: Types of Farming Practiced

Fig 4.2 presents the distribution of respondents according to the type of farming they practice. The results show that 90 (50%) of respondents engaged in crop farming, 30 (16.7%) were involved in livestock farming, and 60 (33.3%)

practiced mixed farming. This indicates that crop farming was the predominant type of agricultural activity among the respondents, likely due to factors such as favorable climatic conditions, soil suitability, and the relative ease of cultivating crops compared to managing livestock.

4.1.3 Household Size of Respondents



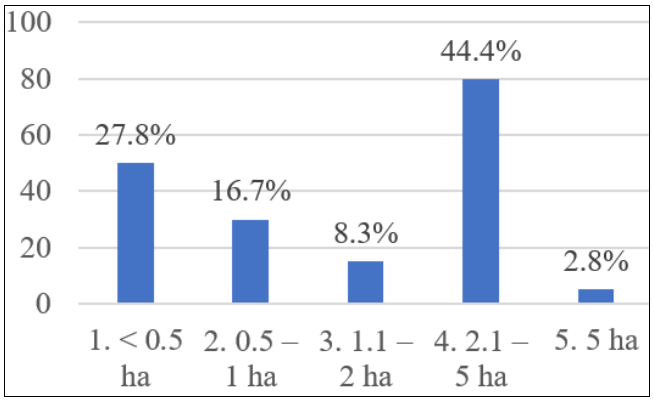
Source: Primary data, 2025

Fig 4.3: Household Size of Respondents

Fig 4.3 presents the distribution of respondents according to the number of members in their households. The results show that 90 (50%) of respondents had 1–3 members, 70 (38.9%) had 4–6 members, 19 (10.6%) had 7–9 members, and 1 (0.6%) had 10 or more members. This indicates that most households in the study area are relatively small, with 1–3 members constituting the majority.

4.2 Effect of Agricultural Productivity on Household Income among Small-Scale Farmers in Chongwe District

4.2.1 The size of their farms

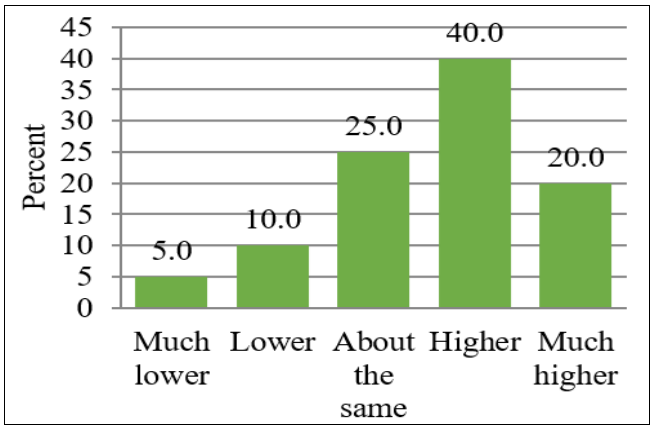


Source: Primary data, 2025

Fig 4.4: The size of their farms

Fig 4.4 presents the distribution of respondents according to the size of their farms. The results indicate that 50 (27.8%) of respondents operated farms smaller than 0.5 hectares, 30 (16.7%) had farms between 0.5 and 1 hectare, 15 (8.3%) owned farms of 1.1–2 hectares, 80 (44.4%) had farms ranging from 2.1 to 5 hectares, and 5 (2.8%) had farms of 5 hectares or more. The findings reveal that the majority of respondents (44.4%) operated medium-sized farms of 2.1–5 hectares, suggesting that a significant portion of small-scale farmers in the study area manage sufficient land to support productive agricultural activities.

4.2.2 Agricultural Production Compared with the Previous Farming Season

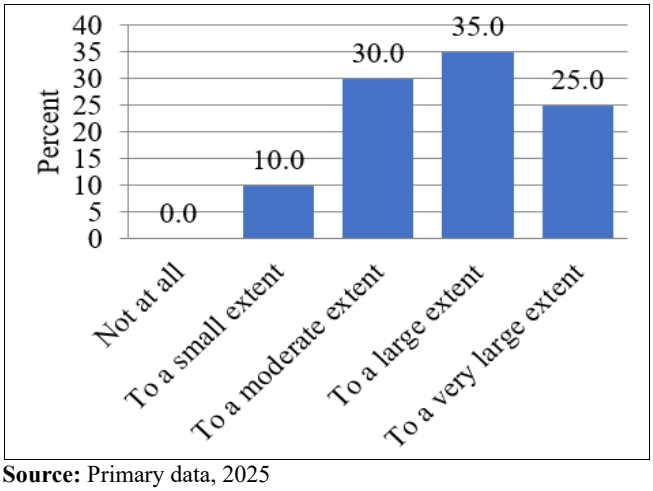


Source: Primary data, 2025

Fig 4.5: Agricultural Production Compared with the Previous Farming Season

The respondents were asked to state how they would rate their agricultural production in the most recent season compared with the previous farming season. The findings in Fig 4.5 above shows that 40.0% of the respondents indicated higher, 25.0% indicated about the same, 20.0% indicated much higher, 10.0% indicated lower and 5.0% indicated much lower. Overall, the majority of the respondents indicated that their agricultural production in the most recent season was higher compared to the previous season.

4.2.3 Contribution of Increased Agricultural Production to Household Income



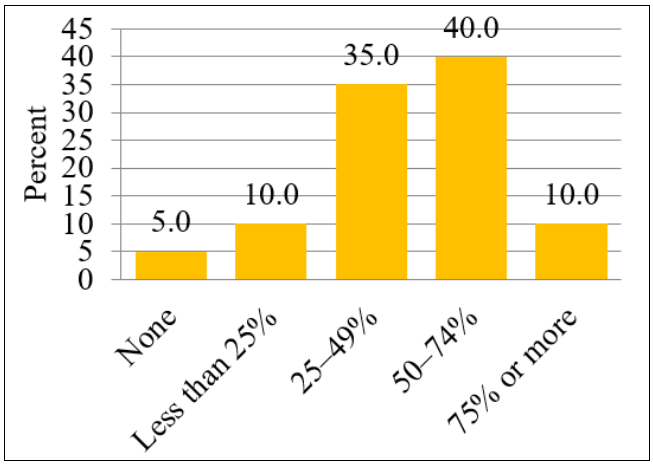
Source: Primary data, 2025

Fig 4.6: Contribution of Increased Agricultural Production to Household Income

The respondents were asked to state to what extent increased agricultural production has contributed to an increase in their household income. The findings in Fig 4.6 above shows that 35.0% of the respondents indicated to a large extent, 30.0% indicated to a moderate extent, 25.0% indicated to a very large extent, 10.0% indicated to a small extent and 0.0% indicated not at all. Overall, the majority of the respondents indicated that increased agricultural production has contributed to an increase in their household income to a large extent.

4.3 To examine the relationship between agricultural productivity and household food security in the study area

4.3.1 Proportion of Household Food Requirements Met from Own Agricultural Production

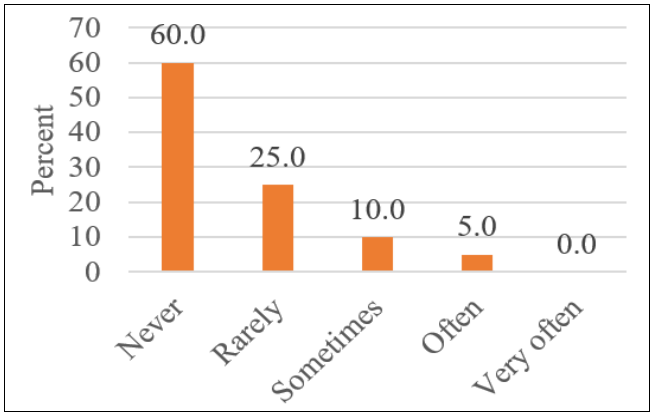


Source: Primary data, 2025

Fig 4.7: Proportion of Household Food Requirements Met from Own Agricultural Production

The respondents were asked to state how much of their household's food requirements are normally met from their own agricultural production. The findings in Fig 4.7 above shows that 40.0% of the respondents indicated 50–74%, 35.0% indicated 25–49%, 10.0% indicated less than 25%, 10.0% indicated 75% or more and 5.0% indicated none. Overall, the majority of the respondents indicated that 50–74% of their household's food requirements are normally met from their own agricultural production.

4.3.2 Frequency of Household Food Shortages

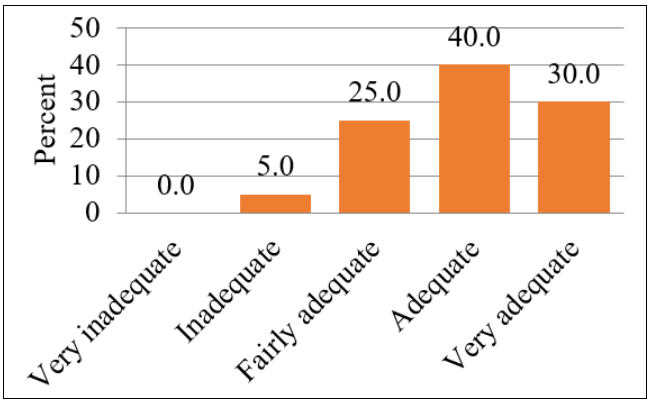


Source: Primary data, 2025

Fig 4.8: Frequency of Household Food Shortages

The respondents were asked to state how often their household experienced a shortage of food because available food was insufficient during the past 12 months. The findings in Fig 4.8 above shows that 60.0% of the respondents indicated never, 25.0% indicated rarely, 10.0% indicated sometimes, 5.0% indicated often and 0.0% indicated very often. Overall, the majority of the respondents indicated that their household never experienced a shortage of food because available food was insufficient during the past 12 months.

4.3.3 Household Food Availability During Most Months of the Year

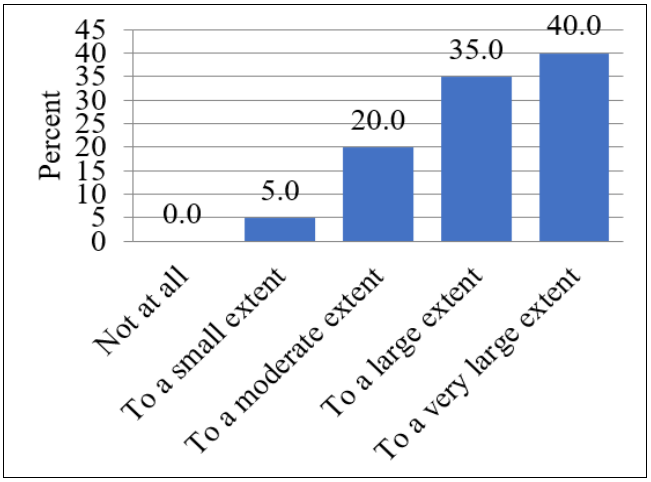


Source: Primary data, 2025

Fig 4.9: Household Food Availability During Most Months of the Year

The respondents were asked to state how they would describe the availability of food in their household during most months of the year. The findings in Fig 4.9 above shows that 40.0% of the respondents indicated adequate, 30.0% indicated very adequate, 25.0% indicated fairly adequate, 5.0% indicated inadequate and 0.0% indicated very inadequate. Overall, the majority of the respondents indicated that the availability of food in their household during most months of the year is adequate.

4.3.4 Effect of Increased Agricultural Production on the Quantity of Food Available for Household Consumption

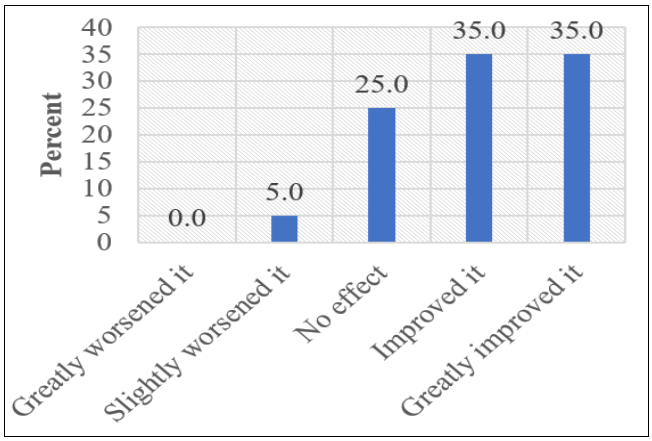


Source: Primary data, 2025

Fig 4.10: Agricultural production and the quantity of food available

The respondents were asked to state to what extent increased agricultural production has improved the quantity of food available for their household consumption. The findings in Fig 4.10 above shows that 40.0% of the respondents indicated to a very large extent, 35.0% indicated to a large extent, 20.0% indicated to a moderate extent, 5.0% indicated to a small extent and 0.0% indicated not at all. Overall, the majority of the respondents indicated that increased agricultural production has improved the quantity of food available for their household consumption to a very large extent.

4.3.5 Effect of Agricultural Productivity on Maintaining a Stable Food Supply Throughout the Year



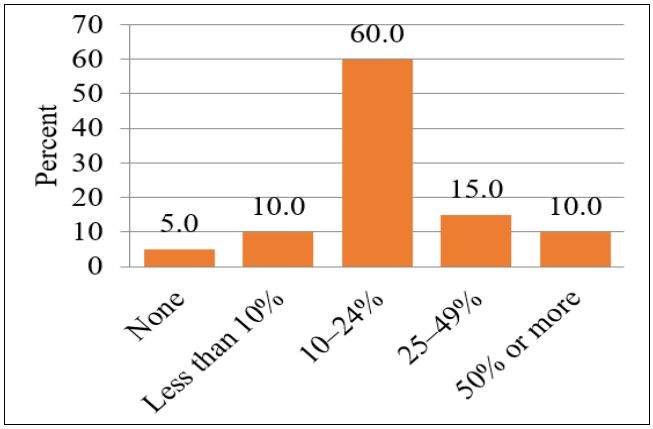
Source: Primary data, 2025

Fig 4.11: Agricultural Productivity and Maintaining a Stable Food Supply

The respondents were asked to state how agricultural productivity has affected their household's ability to maintain a stable supply of food throughout the year. The findings in Fig 4.11 above shows that 35.0% of the respondents indicated improved it, 35.0% indicated greatly improved it, 25.0% indicated no effect, 5.0% indicated slightly worsened it and 0.0% indicated greatly worsened it. Overall, the majority of the respondents indicated that agricultural productivity has improved their household's ability to maintain a stable supply of food throughout the year.

4.4 To analyze how agricultural productivity influences access to basic social services such as education and health within farming households

4.4.1 Allocation of Agricultural Income towards Education Expenses

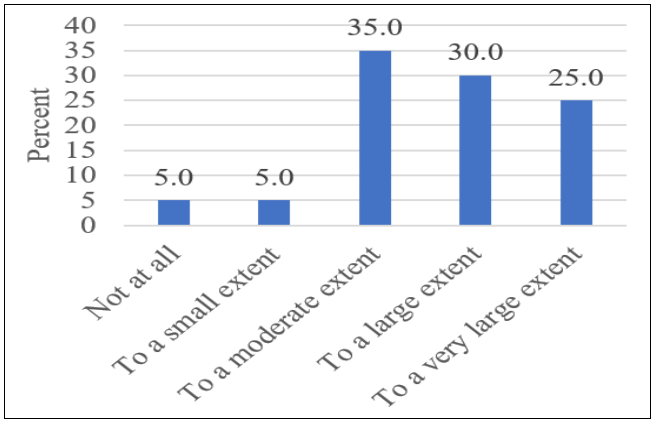


Source: Primary data, 2025

Fig 4.12: Allocation of Agricultural Income towards Education Expenses

The respondents were asked to state how much of their household's agricultural income is normally allocated towards education expenses such as school fees, uniforms and learning materials. The findings in Fig 4.12 above shows that 60.0% of the respondents indicated 10–24%, 15.0% indicated 25–49%, 10.0% indicated less than 10%, 10.0% indicated 50% or more and 5.0% indicated none. Overall, the majority of the respondents indicated that 10–24% of their household's agricultural income is normally allocated towards education expenses.

4.4.2 Effect of Agricultural Income on the Ability to Meet Education Expenses

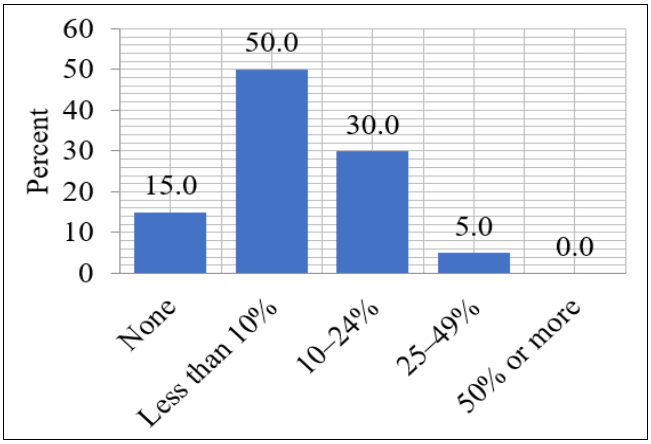


Source: Primary data, 2025

Fig 4.13: Effect of Agricultural Income on the Ability to Meet Education Expenses

The respondents were asked to state to what extent income from agricultural activities has improved their household's ability to meet education expenses. The findings in Fig 4.13 above shows that 35.0% of the respondents indicated to a moderate extent, 30.0% indicated to a large extent, 25.0% indicated to a very large extent, 5.0% indicated to a small extent and 5.0% indicated not at all. Overall, the majority of the respondents indicated that income from agricultural activities has improved their household's ability to meet education expenses to a moderate extent.

4.4.3 Allocation of Agricultural Income towards Health-Related Expenses



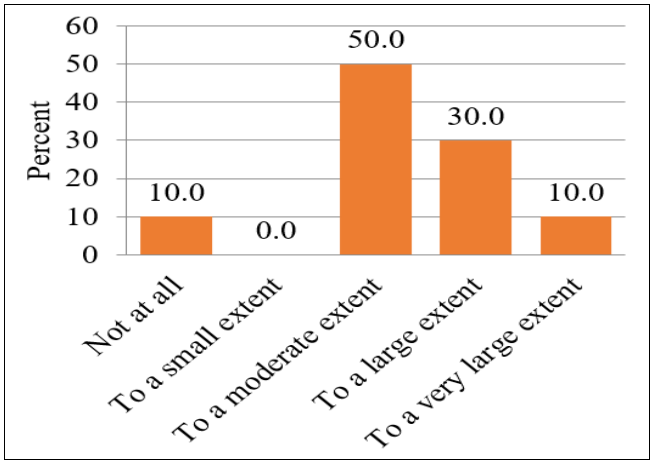
Source: Primary data, 2025

Fig 4.14: Allocation of Agricultural Income towards Health-Related Expenses

The respondents were asked to state how much of their household's agricultural income is normally used for health-related expenses such as consultation fees, medicines and transport to health facilities. The findings in Fig 4.14 above shows that 50.0% of the respondents indicated less than 10%, 30.0% indicated 10–24%, 15.0% indicated none, 5.0% indicated 25–49% and 0.0% indicated 50% or more.

Overall, the majority of the respondents indicated that less than 10% of their household's agricultural income is normally used for health-related expenses.

4.4.4 Effect of Agricultural Income on Access to Healthcare

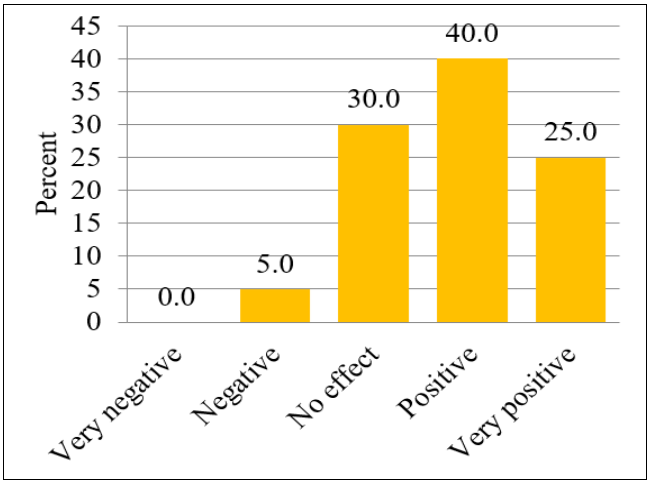


Source: Primary data, 2025

Fig 4.15: Effect of Agricultural Income on Access to Healthcare

The respondents were asked to state to what extent agricultural income has improved their household's ability to access healthcare when a household member becomes sick. The findings in Fig 4.15 above shows that 50.0% of the respondents indicated to a moderate extent, 30.0% indicated to a large extent, 10.0% indicated not at all, 10.0% indicated to a very large extent and 0.0% indicated to a small extent. Overall, the majority of the respondents indicated that agricultural income has improved their household's ability to access healthcare when a household member becomes sick to a moderate extent.

4.4.5 Overall Effect of Increased Agricultural Productivity on Access to Basic Social Services



Source: Primary data, 2025

Fig 4.16: Increased Agricultural Productivity on Access to Basic Social Services

The respondents were asked to state overall, how they would rate the effect of increased agricultural productivity on their household's access to basic social services such as education and health. The findings in Fig 4.16 above shows that 40.0% of the respondents indicated positive, 30.0% indicated no effect, 25.0% indicated very positive, 5.0% indicated negative and 0.0% indicated very negative. Overall, the majority of the respondents indicated that the effect of increased agricultural productivity on their household's access to basic social services such as education and health is positive.

4.5 Discussions of the Research Findings

This section discusses the research findings in relation to the research background information of the respondents and specific findings according to the objectives of the study.

4.5.1 Effect of Agricultural Productivity on Household Income among Small-Scale Farmers in Chongwe District

The findings on farm size indicate that small-scale farmers in Chongwe District operate farms of varying sizes, with medium-sized holdings being particularly common. This suggests that the amount of land available to households is an important factor influencing agricultural productivity because larger cultivated areas provide farmers with greater opportunities to produce food for consumption and generate marketable surpluses. The finding implies that access to adequate productive land can strengthen household income and improve living conditions by enabling farmers to expand production and diversify crops.

This finding is aligned with Mainza (2022) [15], who found that larger cultivated land size significantly improved household income among smallholder farmers in Chibombo District because farmers with more land had greater opportunities to engage in productive agricultural activities. Similarly, Nkomoki *et al*. (2019) [27] found that cultivated land size was an important determinant of household food security among smallholder farmers in Southern Zambia. The present finding therefore concurs with existing Zambian evidence that access to productive land is important for improving agricultural outcomes. However, land size alone may not guarantee improved living conditions because farmers also require inputs, finance, extension services and reliable markets to utilize available land effectively.

The findings indicate that agricultural production among the surveyed households had generally improved compared with the previous production season, although some households experienced lower or unchanged production. This suggests that productivity among small-scale farmers is capable of improving household welfare when farmers are able to increase output. Higher production can create greater quantities of food for household consumption while also generating surplus produce for sale, thereby providing additional resources for meeting household needs.

The finding is consistent with Silva *et al*. (2023) [33], who found that closing maize productivity gaps among smallholder farmers in Zambia could substantially improve farm output, food availability and household income. It also concurs with Kuntashula *et al*. (2023) [11], whose study in Chipata District established that adoption of improved fallow technology increased maize productivity and generated higher household income. These studies demonstrate that improvements in agricultural production can translate into broader household welfare benefits. Nevertheless, the existence of households whose production did not improve suggests that productivity gains are not uniform and may depend on access to improved technologies, inputs, extension support and favourable climatic conditions.

The findings show that increased agricultural production makes a substantial contribution to household income among small-scale farmers. This implies that improvements in productivity are not limited to increasing physical farm output but can also strengthen the financial capacity of households. When farmers produce more than they require for household consumption, the additional produce can be sold to generate income for household expenditure, investment and future agricultural activities.

The finding is consistent with Nguyen and Tran (2023) [26], who found that increased agricultural productivity significantly improved household earnings through higher marketable surpluses and better farm profitability. Similarly, Adebayo *et al*. (2023) [2] established that smallholder households with higher crop yields realized greater annual incomes, with improved farm management practices and agricultural support contributing to productivity. The present finding therefore concurs with these studies in demonstrating the importance of increased agricultural production as a pathway to improved household economic welfare. It also suggests that policies designed to increase farm output should be accompanied by measures that improve farmers' access to profitable markets so that increased production can be converted into meaningful income gains.

4.5.2 Discussion of Objective Two: To Examine the Relationship Between Agricultural Productivity and Household Food Security in the Study Area

The findings show that own agricultural production contributes meaningfully to meeting household food requirements, although households differ in the extent to which they depend on their own production. This indicates that agricultural productivity has an important role in household food self-sufficiency because productive farms can provide food directly while reducing the need to purchase all household food requirements. The finding is consistent with Kumar *et al*. (2022), who found that households with higher crop yields experienced improved food availability and reduced vulnerability to seasonal food shortages. It also concurs with Nkomoki *et al*. (2019) [27], who established that agricultural productivity and access to productive resources were important determinants of household food security among smallholder farmers in Southern Zambia. The finding therefore demonstrates that increasing agricultural productivity can strengthen household capacity to produce food for consumption. However, dependence on own production alone may not guarantee food security throughout the year, particularly where farmers face seasonal production patterns, climate variability and inadequate storage facilities. Farmers therefore need both productive farming systems and reliable market access to maintain food availability when own production is insufficient.

The findings indicate that food shortages are generally not a persistent problem for most households, although some households continue to experience shortages at different times. This suggests that agricultural production contributes to stabilizing household food availability and reducing vulnerability to hunger. The finding is consistent with Ntakyo and Berg (2022), who found that households with higher agricultural productivity experienced lower incidences of food insecurity and improved nutritional outcomes in Uganda. It is also aligned with Snapp *et al*. (2018) [34], who established that diversified agricultural production systems improved food availability and reduced household food insecurity among smallholder farmers in Malawi. These studies support the view that productivity and diversification can provide households with a more reliable food supply. The implication for Chongwe District is that interventions aimed at improving productivity should not focus exclusively on increasing the volume of one crop but should also encourage crop diversification and sustainable production practices. Such measures can reduce household vulnerability to seasonal shortages and production shocks.

The findings demonstrate that agricultural production contributes positively to household food availability among small-scale farmers. This suggests that productive agricultural systems enable households to maintain adequate food supplies and reduce dependence on external food purchases. The finding is important because adequate food availability is a fundamental component of household living conditions and contributes to improved nutrition, health and economic stability. The finding concurs with Abate *et al*. (2022), who established that households achieving higher crop productivity experienced greater food availability, dietary diversity and resilience against seasonal food shortages. It is also consistent with Phiri and Chibomba (2024), who found that increased agricultural productivity among smallholder farmers in Chisamba District improved household food consumption and strengthened resilience against food shortages. The evidence therefore suggests that improving agricultural productivity in Chongwe can contribute to stronger household food security. Nevertheless, sustained food availability also requires appropriate storage facilities, improved post-harvest management and access to markets because production gains can be undermined when farmers lose substantial quantities of produce after harvesting.

The findings indicate that increased agricultural production has a positive effect on the quantity of food available to households. This means that improvements in farm output can increase the amount of food retained for household consumption, thereby reducing the risk of inadequate food supplies. Increased production may also provide surplus food that can be stored or sold, allowing households to obtain other food products that they do not produce themselves. The finding agrees with Awotide *et al*. (2023) [5], who found that households adopting productivity-enhancing agricultural technologies achieved higher yields and experienced lower levels of food insecurity. The finding is also aligned with Kaluba *et al*. (2021) [10], who established that improved soil fertility management increased crop yields and strengthened household food supplies among cassava-producing households in Northern Zambia. These findings demonstrate that agricultural productivity is an important mechanism through which households can increase the quantity of food available for consumption. However, increasing production should be accompanied by improved storage and post-harvest management to ensure that additional output translates into sustained food availability rather than being lost after harvesting.

The findings indicate that agricultural productivity contributes to maintaining a more stable food supply throughout the year, although productivity gains do not benefit every household equally. This suggests that higher production can help households bridge periods when agricultural output is lower by providing sufficient food

reserves or income from surplus sales. The finding concurs with Manda *et al*. (2021) [16], who found that climate-smart agricultural practices increased productivity, improved dietary diversity and reduced household food insecurity during difficult seasons. It is also consistent with Snapp *et al*. (2018) [34], who demonstrated that diversified production systems increased food availability and reduced food insecurity among smallholder households. These findings imply that stable food supply depends not only on increasing production but also on developing farming systems capable of sustaining output under changing climatic and seasonal conditions. For farmers in Chongwe District, promoting crop diversification, conservation agriculture, irrigation and climate-resilient technologies could therefore strengthen year-round food availability and reduce seasonal vulnerability.

4.5.3 Discussion of Objective Three: To Analyze How Agricultural Productivity Influences Access to Basic Social Services Such as Education and Health Within Farming Households

The findings show that agricultural income is used by households to support educational needs, demonstrating that agricultural productivity has implications beyond food and income generation. This means that earnings from farming can provide households with the financial capacity to meet school-related costs and support children's continued participation in education. The finding is consistent with Rahman *et al*. (2023) [30], who found that increased agricultural productivity improved household investments in children's education alongside other social services. It also concurs with Adhikari *et al*. (2021) [3], who established that households with improved agricultural productivity experienced better school enrolment outcomes and greater access to social services. These findings demonstrate that agricultural productivity can contribute to human capital development by enabling farming households to invest in education. The implication is that agricultural development programmes may produce longer-term welfare benefits because improved educational opportunities can enhance the future economic prospects of household members. However, this relationship depends on households having sufficient and stable agricultural income and on education services being physically and financially accessible.

The findings indicate that agricultural income improves households' ability to meet education-related expenses. This suggests that farming is an important financial mechanism through which households can support school fees, learning materials, transport and other education requirements. The finding is important because the ability to consistently meet education expenses can influence school attendance and educational attainment, thereby contributing to long-term improvements in household welfare. The finding agrees with Kumar and Singh (2022), who found that increased agricultural productivity improved household income and enabled families to afford better education and healthcare. It is also consistent with Nguyen *et al*. (2024) [25], who established that increased agricultural productivity contributed to improved educational attainment among rural households. These findings reinforce the argument that agricultural productivity can indirectly improve living conditions through investment in human capital. Nevertheless, agricultural income alone may not eliminate barriers to education because regional disparities in infrastructure and service provision can continue to constrain educational opportunities. Therefore, productivity interventions should be complemented by improvements in rural education infrastructure.

The findings demonstrate that agricultural income is used to meet household healthcare expenses, although households differ in the amount of agricultural income directed towards health needs. This indicates that agricultural earnings provide an important source of financial support for healthcare, including treatment, medication, transportation and other related costs. The finding is aligned with Manda and Alwang (2022), who found that households with higher agricultural productivity experienced improved access to healthcare services as a result of increased farm income. It also concurs with Mango *et al*. (2021) [17], who established that increased crop productivity enhanced household incomes and enabled families to afford healthcare services in Zimbabwe. The finding implies that agricultural productivity can contribute to household health not only through improved food availability and nutrition but also by increasing the financial capacity to seek medical care. However, the ability to use agricultural income for healthcare may remain vulnerable to seasonal income fluctuations and unexpected health costs. Strengthening agricultural productivity alongside accessible and affordable rural health services is therefore important for sustainable improvements in household welfare.

The findings indicate that agricultural income contributes positively to households' ability to access healthcare services. This suggests that increased productivity and farm earnings can reduce financial barriers that prevent households from seeking healthcare when needed. The finding is important because access to healthcare is a major dimension of household living conditions, and the ability to meet medical costs can protect households from the adverse effects of illness and prevent health-related financial distress. The finding agrees with Ali *et al*. (2023) [4], who found that higher agricultural productivity increased household income and subsequently improved access to healthcare and other essential social services. It is also consistent with Adhikari *et al*. (2021) [3], who established that households with improved agricultural productivity recorded greater utilization of health facilities. These findings demonstrate that agricultural productivity can influence healthcare access indirectly through increased household financial resources. However, higher agricultural income does not automatically guarantee effective healthcare access where health facilities are distant or inadequately resourced. Consequently, agricultural development should be complemented by improvements in rural healthcare infrastructure and service delivery.

The findings indicate that increased agricultural productivity has an overall positive influence on households' access to basic social services, particularly education and healthcare. This demonstrates that the benefits of agricultural productivity extend beyond increased farm output and income to broader improvements in household living conditions. Increased productivity can create financial resources that enable households to invest in children's education, meet healthcare expenses and improve general household welfare. The finding strongly concurs with Phiri and Chibomba (2025) [28], who found that households with higher agricultural productivity in Chisamba District experienced increased incomes and greater expenditure on school fees, medical care, improved nutrition and housing. It

is also aligned with Ngoma *et al*. (2021) [23], who established that increased agricultural output associated with agricultural input support strengthened household income and improved families' capacity to access education, healthcare and other essential social services. These findings demonstrate that agricultural productivity can serve as an important pathway for improving living conditions among small-scale farming households. However, the evidence also suggests that productivity interventions should be complemented by broader rural development measures because household welfare depends on the availability, affordability and quality of social services. Therefore, policies aimed at improving agricultural productivity in Chongwe District should simultaneously strengthen market access, extension services, rural infrastructure, education and healthcare provision.

5. Overview

This chapter presents the conclusion and recommendations arising from the study on the effect of agricultural productivity on household living conditions among small-scale farmers in Chongwe District. The conclusions are drawn from the study findings and are organized according to the specific objectives. The recommendations are proposed to support government institutions, development partners, agricultural extension officers and farmers in implementing interventions that improve agricultural productivity and household welfare.

5.1 Conclusion

The study concluded that agricultural productivity is an important determinant of household living conditions among small-scale farmers in Chongwe District. The findings demonstrated that improved agricultural production enabled households to generate income through the sale of agricultural produce and strengthened their ability to meet regular household financial obligations. Agricultural productivity therefore contributes to improved economic wellbeing by increasing household earning capacity and creating opportunities for investment in productive activities. The study consequently concludes that strengthening agricultural productivity is essential for improving household incomes and reducing economic vulnerability among small-scale farming households in Chongwe District.

The study further concluded that agricultural productivity contributes positively to household food security and access to basic social services. Increased agricultural production improved household food availability and strengthened households' capacity to withstand food shortages. In addition, agricultural income enabled households to support children's education and meet healthcare-related expenses, demonstrating that the benefits of agricultural productivity extend beyond food and income generation. The study therefore concludes that sustainable investments in agricultural productivity can improve both the economic and social wellbeing of small-scale farming households and contribute to sustainable rural development in Chongwe District and Zambia more broadly.

5.2 Recommendations

1. Strengthening agricultural extension services: The Ministry of Agriculture should strengthen agricultural extension services by increasing the availability of extension officers and providing regular training to farmers on modern farming techniques, improved farm management, climate-smart agriculture and sustainable production practices. This will enable farmers to improve productivity and consequently strengthen household income.
2. Improving access to agricultural inputs: The Government of Zambia, through the Ministry of Agriculture and programmes such as the Farmer Input Support Program (FISP), should improve farmers' access to affordable and quality agricultural inputs, including improved seed varieties, fertilizers and appropriate farming technologies. This can increase agricultural production and strengthen household food security.
3. Expanding access to agricultural finance: The Ministry of Finance and National Planning, commercial banks, microfinance institutions and other financial service providers should develop and expand affordable agricultural credit facilities for small-scale farmers. Accessible financing would enable farmers to invest in inputs, equipment, improved technologies and other productive activities that can increase agricultural productivity and household income.
4. Improving market access and storage facilities: The Ministry of Agriculture, Ministry of Local Government and Rural Development and cooperating partners should invest in rural market infrastructure, storage facilities and feeder roads. Improved market access would enable farmers to sell surplus agricultural produce at better prices, while adequate storage facilities would reduce post-harvest losses and preserve agricultural output for future consumption or sale.
5. Promoting crop diversification and climate-smart agriculture: Agricultural extension officers, the Ministry of Agriculture and non-governmental organizations should encourage farmers to diversify crops and adopt climate-smart agricultural practices. Crop diversification can improve dietary diversity and reduce dependence on a single crop, while climate-resilient practices can help farmers maintain production during adverse weather conditions and strengthen household food security.
6. Linking agricultural programmes with education and healthcare: The Ministry of Agriculture should collaborate with the Ministries of Education and Health, local authorities and community-based organizations to integrate agricultural development programmes with education and health interventions. Since agricultural income supports households in meeting education and healthcare expenses, strengthening these linkages can translate productivity gains into broader improvements in household living conditions.
7. Promoting further research: Universities, researchers and research institutions should conduct similar studies in other districts and provinces of Zambia using larger samples and different research approaches. Such studies would provide additional evidence on the relationship between agricultural productivity and household living conditions and improve the generalizability of findings beyond Chongwe District.

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