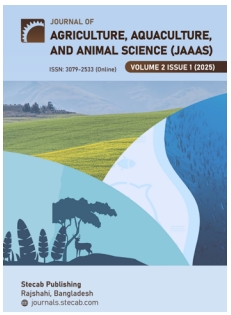

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Research Article

Analyzing the Effects of Agricultural Productivity on Household Living Conditions: A Study of Chisamba District in Zambia

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About Article

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ABSTRACT

Agriculture remains one of the most important activities in Zambia. Zambia remains vulnerable to unstable food prices and food insecurity despite competitive advantages such as abundant agricultural land and a generally favorable climate for food production. This research analyzes the effects of agricultural productivity on household living conditions. The research was addressed by the following objectives; To analyze the effects of agricultural productivity on household living conditions; To ascertain how improved agricultural productivity affects family investments; To assess how improved agricultural productivity improves household food consumption patterns. A sample of 50 respondents was selected from various farmers to help provide data. The research utilized both qualitative and quantitative methods, surveys and focus group discussions. From the findings on how Agricultural productivity improves income levels, 36% said increased yields lead to more crops, livestock and income, 28% said it leads to diversification of crops and livestock tapping into markets with higher demand, and 36% said it leads to creation of more jobs in the agricultural sector. The respondents were asked the types of investments they made with increased agricultural productivity and 34% invested in farm infrastructure, 30% invested in land expansion or improvement, 8% invested in research and development, 6% invested in value added processing facilities, and 22% invested in livestock. The farmers were also asked on the influence of agricultural productivity on nutritional quality of food consumption within the households. 28% said it leads to greater availability and access to a variety of food items within the household, 30% said it improves affordability of nutrient-dense foods for households, 22% said it may lead to greater processing and packaging of food products, which can result in loss of nutritional quality, and 20% said it leads to intensive agricultural practices associated with increased productivity which can lead to nutrient depletion in the soil which then impacts the nutritional quality of crops grown in these soils. The key findings also highlighted a diverse range of challenges faced by most small-scale farmers, including poor agricultural productivity/yields due to climate change, and poor investment patterns due to poor yields. Despite the challenges faced, a good portion of respondents expressed satisfaction and fulfillment in their agricultural activities. This study shows the various coping mechanisms employed by farmers such as investments patterns, saving patterns, and irrigation practices. Preliminary findings suggested a significant positive correlation between agricultural productivity and household living conditions, with improvements observed in income levels, asset ownership, and food security. These findings hold crucial implications for policymakers, highlighting the importance of targeted interventions to enhance agricultural productivity as a means to improve household well-being and promote sustainable development.

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1. INTRODUCTION

1.1. Background

Rimando (2004) explains agriculture as a systematic raising of useful plants and livestock under the management of man. According to Coelli *et al.* (2005), productivity can be classified into three broad components: technical change, scale effects, and changes in the degree of technical efficiency. Therefore, productivity is a situation in which a firm can achieve more output from a given combination of inputs or equivalently, the same amount of output from fewer inputs. Thus Agricultural Productivity, is referred to as the measurement of the quantity of agricultural output produced for a given quantity of input or a set of inputs (Mozumdar, 2012).

According to Tembo and Sitko (2013), Zambia, like much of the Southern African region, remains vulnerable to unstable food prices and food insecurity despite competitive advantages such as abundant agricultural land and a general favorable climate for food production. Agriculture plays a key role of supporting industries (the agro-based industry) by the production of the required raw materials, producing exportable agricultural goods, generating employment particularly in rural areas (approximately 70 percent of the population derives its livelihood from agriculture), as well as providing food stuffs essential for the sustenance of acceptable nutrition standards and levels, and improves the general economy (Darku *et al.*, 2010).

Policies aimed at raising agricultural productivity have been a centerpiece in the fight against global poverty. Roughly two-thirds of the world's population living below the poverty line work in agriculture (Castaneda et al, 2016). In this context, interventions aimed at improving agricultural productivity, such as programs providing access, information, training or subsidies for modern inputs and production techniques, have played a prominent role in the global fight against poverty (Bergquist *et al.*, 2022).

Empirical studies across many developing countries document that improving agricultural productivity is the main pathway out of poverty, this can be done by improving the productivity, profitability, and sustainability of smallholder farmers (Loayza and Raddatz, 2010). Chisamba district is a district located in the central province of Zambia. It covers a total surface area of 5,526 sq.km and is known for its agricultural activities with over 32,000 small scale farming families and 256 commercial farmers. This study will target the farmers of Chisamba district.

1.2. Statement of the problem

Despite Zambia experiencing strong economic growth in the recent past, agriculture has not performed well. Some of the major constraints on agriculture in Zambia are: low spending on agriculture-related developments which resulted in dilapidated agricultural support infrastructure and inadequate delivery of extension services; poor infrastructure in rural areas causes high distribution costs leading to higher prices of food; natural disasters such as drought and floods due to climate change; lack of information on appropriate technologies; HIV/AIDS has emerged as a serious constraint to the development of the agricultural sector; inadequate value addition due to lack of fully developed agro industries resulting in export of raw materials; inadequate mechanization of the agricultural sector; high dependence on rain-fed agriculture; non-availability or poor access to inputs, and many others. Agricultural productivity is a key driver for the well-being of farmers, the agro-based industry and the general economy. It is linked to food security, food prices, and poverty alleviation in the developing countries (Darku & Malla, 2010). Majority of the people live in rural areas and they highly depend on agriculture for their livelihood. There is need to underscore the importance of continually increasing agricultural productivity given the rapid increase in population. This study is going to investigate the effects of agricultural productivity on the farmers of Chisamba district.

1.3. General objective of the study

The general objective of this study is to analyze the effects of agricultural productivity on household living conditions: a case study to be conducted on several farmers of Chisamba.

1.3.1. Specific objectives of the study

i. To analyze the effects of agricultural productivity on household living conditions.

ii. To ascertain how improved agricultural productivity affects family investments.

iii. To assess how improved agricultural productivity improves household food consumption patterns.

1.4. Research Questions

i. What are the effects of agricultural productivity on household living conditions?

ii. How does improved agricultural productivity affect family investments?

iii. Does improved agricultural productivity improve household food consumption patterns?

1.5. Theoretical framework

Tromp and Kombo (2006) define a theoretical framework as a collection of basic premises about the existence of the phenomenon. The theoretical framework which will guide this study is Udemezue and Osegbue's theories and models (2018) of agricultural development theory.

Udemezue and Osegbue (2018), proposed five models or theories that represent agricultural development, these are: the frontier model, the conservation model, the urban-industrial impact model, the diffusion model, and the high-pay off input model. This study will be guided by the high-pay off input model

1.5.1. The High-pay off input Model

The inadequacy of policies based on the conservation, urban-industrial impact, and the diffusion models led to a new perspective in the 1960s. The key to transforming a traditional agricultural sector into a productive source of economic growth is investment designed to make modern high-pay off inputs available to farmers in poor countries (Shultz, 1964). Peasants in traditional agricultural systems were viewed as rational, efficient resource allocators. Proponents of the High-pay-off-input model argue that peasants in developing countries remained poor because there were only limited technical and economic opportunities to which they could respond. The

supply of new technological inputs and the availability of such opportunities, therefore, could enable the traditional farmers to make uses of the chances and overcome their poverty (Ibid). According to Ruttan (1977), the new high pay off inputs were classified into three categories, these are: the capacity of Public and private sectors research institutions to produce new technical knowledge; the capacity of the industrial sector to develop, produce and market new technical inputs; the capacity of Farmers to acquire new knowledge and use new inputs efficiently and effectively. The enthusiasm with which the high-pay off input model has been accepted and translated into an economic doctrine has been due in substantial part to the success of efforts to develop new high-productivity grain varieties suitable for the tropics (Brown, 1970).

New high yielding wheat and corn varieties were developed in Mexico, beginning in the 1950s, and new high yielding rice varieties in the Philippines in the 1960s. These varieties were highly responsive to industrial input such as fertilizers and other chemicals and to more effective soil and water management (Udemezue & Osegbue, 2018). However, the high returns associated with the adoption of the new varieties and the associated technical inputs and management practices have led to rapid diffusion of the new varieties among farmers in several countries in Asia, Africa and Latin America (Ibid).

Ruttan (1977) states that the model remains incomplete as a theory of agricultural development. However, education and research are public goods not traded through the market place. The mechanism by which resources are allocated among education, research and other alternative public and private sector economic activities are not fully incorporated into the model. More so the model doesn't treat investment in research as the source of new high-pay off techniques. It doesn't explain how economic conditions induce the development and adoption of an efficient set of technologies for a particular society. Nor does it attempt to specify the process by which factors and product price relationships induce investment in research in a particular direction (Ibid).

2. LITERATURE REVIEW

Agriculture is the art and science of growing plants and other crops and raising animals for food, other human needs, or economic gain. Agriculture is a priority sector in achieving sustainable economic growth and reducing poverty and food insecurity. Discussed are;

a) Effects of Agricultural productivity on household living conditions.

b) How improved agricultural productivity affect family investments.

c) How improved agricultural productivity improves household food consumption patterns.

2.1. Effects of agricultural productivity on household living conditions

Increasing agricultural productivity has been the world's primary defense against a recurring Malthusian crisis where needs of a growing population outstrip the ability of humankind to supply food (Fuglie & Wang, 2012). Ball *et al.* (2007), explains that productivity growth in agriculture allows farm commodities to be grown and harvested more cheaply. This benefits not only farmers but also food and textile manufacturers and consumers. Most of these cost reductions are passed on to non-farm economy as lower commodity prices. Productivity growth in agriculture is a key reason why, on average, the American consumer spends a small and declining share of family income on food.

The United States not only increases its agricultural productivity so as to be food secure, but also for the purpose of exporting the excess food and other agricultural products to developing countries either for agribusiness purposes or as foreign aid. Kraybill and Mercier (2019) assert that many United States agribusinesses and food and agricultural product exporters view developing regions of the world as their best opportunity for market expansion. As low-income economies grow, demand for food rises more rapidly than in high-income countries, where appetites are already largely satiated. Foreign aid that makes agriculture more productive boosts incomes throughout the economy and increases demand for U.S. exports. The end result is more jobs for American producing goods and services for export, and more income in the American economy (Ibid). With such increases, countries like Zambia benefit through food aid and shared knowledge of technology in agriculture to improve productivity.

2.2. How improved agricultural productivity affect family investments

A study conducted in Nigeria and other empirical studies suggested that improving the productivity, profitability, and sustainability of smallholder farming is considered the main pathway out of poverty. Agricultural research and development interventions focused on agricultural intensification and modernizing market channels for agricultural products can lead to agricultural productivity growth and thereby both reduce poverty and meet growing demands for food (Datt & Ravallion, 1998; Loayza & Raddatz, 2010; Datt & Ravallion, 1999, Mellor, 2001; Thirtle *et al.*, 2003). Improved productivity leads to the following;

Income increase: higher agricultural productivity generally means higher yields or output per unit of input (like land, labor, and capital). This leads to increased income for farming families, which can be used for investments in various areas such as education, healthcare, housing, or saving, and improving farm infrastructure (Gollin *et al.*, 2002). Increased agricultural productivity fosters higher investment levels among farming household. Farmers can invest in;

Education: with more income available, families can afford to send their children to better schools or even invest in additional educational resources such as tutoring or educational materials. This investment in education can lead to better opportunities for children in the future (Datt & Ravallion, 1999).

Healthcare and nutrition: improved agricultural productivity can mean better access to healthcare services and better nutrition outcomes. Families can afford nutritious food, better medical care, vaccinations, and preventive measures, leading to improved overall health outcomes.

Farm infrastructure: higher productivity may allow families to invest in better farming equipment, irrigation systems, or

storage facilities. This improves efficiency, reduces losses, and enhances overall farm productivity in the long run. Diversification: increased income from agriculture can also enable families to diversify their income sources. They may invest in non-agricultural businesses or savings, further stabilizing their financial situation (Mellor, 2001).

2.3. How improved agricultural productivity improves household food consumption patterns

The agricultural sector in Zambia has contributed an annual average of over 6 percent to national GDP during the past decade (World Bank, 2019). Improved agricultural productivity generally leads to improved household food consumption patterns. When agricultural productivity increases, farmers can produce more diverse food, which often leads to lower prices for consumers. This increased availability and affordability of food can improve household food security and allow for a more diverse and nutritious diet (Alene *et al*., 2018).

Additionally, improved productivity can boost incomes for farmers, enabling them to purchase more food or invest in other household needs, further contributing to better overall food consumption patterns. Some of the ways in which improved agricultural productivity positively impacts household food consumption patterns are; increased availability and affordability, when farmers produce more food due to improved productivity (e.g., through better seeds, irrigation, or farming techniques), there is generally more food available in the market. This increased supply can lead to lower prices, making nutritious food more affordable for households, especially those with lower incomes. Diverse and nutritious diet, higher productivity often allows for greater diversity in food production. Farmers can grow a wider range of crops or raise more livestock, providing households with access to a variety of nutritious foods. This diversity is crucial for ensuring balanced diets that meet nutritional needs (Ibid).

Improved food security, food security refers to the availability, accessibility, and utilization of food. Improved agricultural productivity contributes to greater food security by ensuring a stable food supply. Households are less likely to experience food shortages or rely on less nutritious, cheaper alternatives when food is more readily available and accessible (Arslan *et al*., 2013). Health benefits, access to a diverse and nutritious diet can lead to better health outcomes for household members, particularly children and pregnant women. Adequate nutrition supports physical and cognitive development, reduces the risk of malnutrition-related diseases, and improves overall well-being.

2.4. Establishment of research gaps

From the literature review above, many studies highlight short-term impacts of agricultural productivity on food security and economic growth. They, however, lack longitudinal studies tracking the long-term effects of productivity gains on household incomes, poverty alleviation, food security and overall economic development. This includes understanding the persistence of productivity gains and their resilience to external shocks and climate variability. Research gaps exist regarding the environmental sustainability implications of enhancing agricultural productivity. While productivity gains are noted, there is insufficient exploration of the environmental trade-offs associated with environmental degradation and intensive agricultural practices, such as increased use of pesticides and water resources. Assessing these impacts is vital for sustainable agricultural development as well as identify sustainable agricultural practices that can mitigate negative environmental impacts.

There is a need for strict evaluations of the effectiveness of agricultural policies and strategies, such as Kenya's Agricultural Sector Development Strategy (ASDS) and Zambia's prioritization of agriculture, in enhancing productivity and improving living conditions. Research should be conducted to assess whether these policy interventions effectively reach and benefit smallholder farmers and identify barriers to effective implementation and scale-up. More research is needed on the adoption rates, socio-economic impacts and effectiveness of modern agricultural technologies (e.g., mechanization, precision farming, drought-resistant crops, and small-scale irrigation systems) across different regions and farming systems. Therefore, understanding barriers to technology adoption, the effectiveness of extension services in promoting new technologies and the socio-economic impacts of successful adoption is crucial. Studies are also needed to explore how improved agricultural productivity translates into enhanced market access, value chain integration, and income diversification for rural households. This includes examining the role of infrastructure development, market linkages, and policy frameworks.

Research is lacking on the direct effects of agricultural productivity's enhancements on food security and nutrition outcomes at the household level. Studies should investigate how increased agricultural output influences food availability, access, utilization, and dietary diversity, particularly among vulnerable groups such as women and children. There is a need for more detailed studies that quantitatively assess how improvements in agricultural productivity translate into increased household income and reduced poverty levels in rural areas. Specifically, understanding the income gains from agricultural productivity improvements and their distribution among different socio-economic groups is crucial. There is a gap in understanding how enhanced agricultural productivity impacts household livelihood diversification strategies. Research should explore whether increased agricultural income leads to diversification into non-farm activities, thereby improving overall household resilience and well-being.

Although it is mentioned that increased income can lead to investments in education and training, there is a gap in understanding the long-term impact of these investments on human capital development within farming communities. Research could focus on how educational investments influence skills acquisition, employment opportunities, and income growth over successive generations. Limited research exists on how increased agricultural income translates into community-level investments and development initiatives. Studies could investigate the role of farming households in community projects, infrastructure development, and social capital formation resulting from improved agricultural productivity. Many studies indicate short-term impacts of agricultural

productivity on food consumption patterns. However, longitudinal studies tracking changes in dietary diversity, nutritional outcomes, and food security over longer periods are sparse. Understanding how these impacts evolve over time, considering factors like climate variability and economic shifts, would provide deeper insights.

3. METHODOLOGY

3.1. Research Design

A research design can be defined as a detailed plan for data collection and analysis depending on the research question(s) of a particular study (Bell & Bryman, 2011; Lewis *et al.*, 2012; Bougie & Sekaran, 2013). It can also be referred to as the procedures for collecting, analyzing, interpreting and reporting data in research studies. It is the overall plan for connecting the conceptual research problem with the pertinent and achievable empirical research (Creswell & Plano Clark, 2007). The research design to be used in this study is the case study research design. The adoption of this design is influenced by the fact that the case study research design is an in-depth study of a particular research problem rather than a sweeping statistical survey and also because the study involves the collection of data to accurately and objectively describe the existing phenomena as well as determine the nature of the situation at the time of investigation.

3.2. Target Population

According to Bridier and Casteel (2021), a target population is the specific, conceptually bounded group of potential participants to whom the researcher may have access that represents the nature of the population of interest. The target population must be a complete subset of the population of interest-members of the target population must also be described by the boundaries of the population of interest. Robson (2011) defines a target population as a literal population such as people or it may be a universe of nations, cities, firms, and many more. Thus, this segment of the study shows the target population which comprises of smallholder farmers (both men and women of all age groups) selected from Chisamba district of central province. Therefore, the target population is aimed at capturing fifty (50) research participants in totality.

3.3. Sampling Design

The study will use the purposive sampling technique. According to Brink (1996), purposive sampling requires selecting participants who are knowledgeable about the issue in question, because of their sheer involvement in and experience of the situation. While Creswell (2003) states that purposive sampling refers to selection of sites or participants that will best help the researcher understand the problem and the research question, they must be willing to reflect on and share this knowledge. Purposive sampling is appropriate 4because it is known to be representative of the total population, and it produces well-matched groups. Another advantage of using purposive sampling, according to Kristjanson *et al.* (2003), is that individuals who have experienced the phenomenon of interest are invited to participate, contributing a wide range of domain descriptors and construct dimensions.

3.4. Sample Size Determination

A sample is referred to as a small segment of the population that is selected for observation analysis (Best & Kahn, 2008). According to Mugenda and Mugenda (2003), a sample size of 10% of a studied population is sufficient enough to generate valid results. Hence, the sample size of this study will be 10% of the target population which results to 50 participants from Chisamba ward of Chisamba constituency in Chisamba district. 50 male and female smallholder farmers. 50 questionnaires are to be prepared, where 35 questionnaires will be used in a survey on the smallholder farmers, while for the other 15 a focus group discussion will be conducted.

3.5. Data Collection instruments

Data collection instruments refer to devices used to collect data such as questionnaires, tests, structured interview schedules and checklists. Creswell (2008) identifies the following as some of the research instruments that a researcher may use to collect data from the respondents. These include questionnaires, interviews schedules, Observations and focused group discussions. This research study mainly used questionnaires, and focus group discussions. This is because the picked methods are known to maintain good quality information for the production of the best possible results.

3.6. Data Collection Method and procedures

This study will use a mixed method research approach that aims at collecting both qualitative and quantitative data from design as a method that includes both qualitative and quantitative data collection and analysis in parallel form (concurrent mixed method design in which two types of data are collected and analyzed in sequential form). The researcher will carry out a field survey using questionnaires as well as conduct several focus group discussions to collect primary data. The surveys will help in collecting standardized data through consistent questions and response options making it easier to analyze trends, enable generalizations and offer scalability. While focus group discussions will help provide context the participants. Kemper *et al.* (2003) define mixed methods and depth, facilitate interactions leading to richer data, and highlight perceptions and experiences. According to Lewis (2000), this type of interview will yield both a more diversified array of responses, and afford a more extended basis for designing systematic research into the situation at hand.

3.7. Data Analysis

Berg and Lune (2016), defines data analysis as involving a "careful, detailed, systematic examination and interpretation" of collected data to "identify patterns, themes, biases and meanings". The primary data collected will be coded and analyzed using Microsoft Excel. The data will then be coded and keyed using STATA. The results will be tabulated and presented using pie charts and/ or tables for easy dissemination of information and orderly arrangement of data. The collected data will be analyzed using descriptive statistics such as percentages. This allows for easy generalization of data to give account of the characteristics of the population represented by the sample size population.

4. RESULTS AND DISCUSSION

Agriculture is the art and science of growing plants and other crops and raising animals for food, other human needs, or economic gain. Agriculture is a priority sector in achieving sustainable economic growth and reducing poverty and food insecurity. Discussed are;

a) Effects of Agricultural productivity on household living conditions.

b) How improved agricultural productivity affect family investments.

c) How improved agricultural productivity improves household food consumption patterns.

4.1. Gender

Table 1. Gender of respondents

Gender	Frequency	Percent
Male	26	52%
Female	24	48%

The table above shows that 48% respondents were females, while 52% were males.

4.2. Age

Table 2. Age of respondents

	Mean	Standard Deviation	Min	Max
Age	48.34	9.667133	29	65

The researcher sought to find out the age groups of the participants for the survey and the age distribution of the head of households was that the average age was 48.34 with a standard deviation of 9.667133, the youngest respondent was 29 years of age and the oldest was 65 years of age.

4.3. Education background

Table 3. Highest level of education of the respondents

Highest Level of Education	Frequency	Percent
Primary	4	8%
Secondary	25	50%
Tertiary	17	34%
Never been to school	4	8%

The table above shows the different levels of education of the respondents, 8% of which hold a primary school certificate, 50% hold a secondary school certificate, 34% hold a tertiary degree, and 8% have never been to school.

The relationship between the demographic information of respondents and their ability to adopt agricultural practices and make informed decisions about investments and household improvements is that individuals with higher education levels often have better access to information, a deeper understanding of agricultural innovations, and a stronger ability to analyze costs, benefits, and risks. This makes them more likely to adopt advanced farming techniques and make sound investments. While those with limited education may rely on traditional farming methods and informal knowledge. Their ability to assess new practices or technologies may be restricted, leading to slower adoption rates or suboptimal decisions. Younger respondents tend to be more open to innovation and technology. They are also more likely to use digital tools and access modern agricultural resources, enhancing their decision-making and productivity. Whilst older individuals may rely more on experience and traditional methods. While their practical knowledge can be invaluable, they may be less willing or able to adopt new practices, particularly if these require significant changes or investments. In many contexts, men often have greater access to land, credit, and resources, which enables them to adopt new agricultural practices and make significant investments. However, this may vary by region and culture. While women, especially in rural areas, may face barriers such as limited access to land, financial resources, and training. Despite this, women often make decisions that prioritize household welfare, such as investing in nutrition, education, and sustainable farming practices, when given equal opportunities.

Thematic area 1: effects of agricultural productivity on household living conditions.

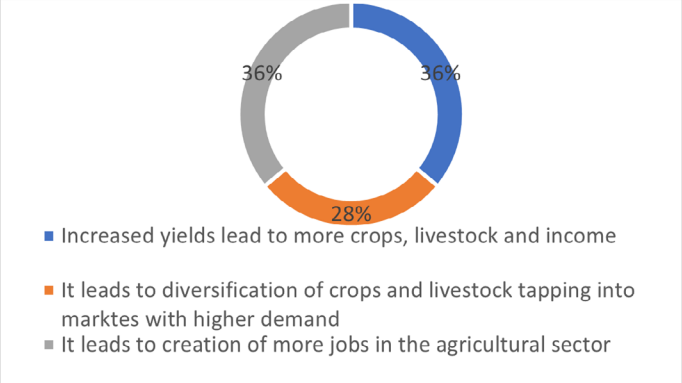

Figure 1. Agricultural productivity and income level

The figure above gives the response of the farmers on how Agricultural productivity improves income levels. 36% said increased yields lead to more crops, livestock and income, 28%

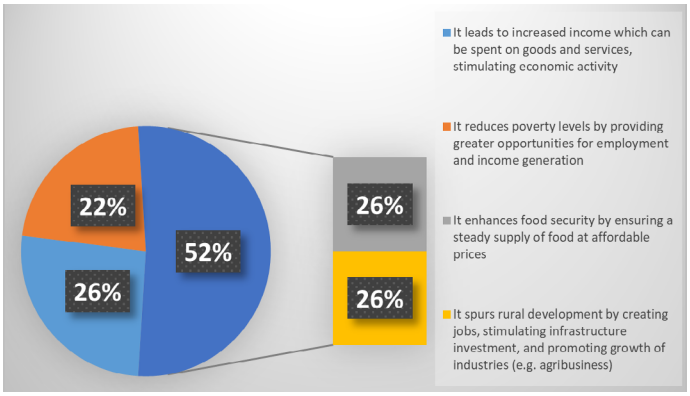

Figure 2. Agricultural productivity and economic well-being

said it leads to diversification of crops and livestock tapping into markets with higher demand, and 36% said it leads to creation of more jobs in the agricultural sector.

Above is the farmers' responses on how agricultural productivity improves the economic well-being of the respondents. 26% responded that it leads to increased income which can be spent on goods and services, stimulating economic activity, 22% responded that it reduces poverty levels by providing greater opportunities for employment and income generation, 26% responded that it enhances food security by ensuring a steady supply of food at affordable prices, and 26% responded that it spurs rural development by creating jobs, stimulating infrastructure investment, and promoting the growth of related industries such as agribusiness and food processing.

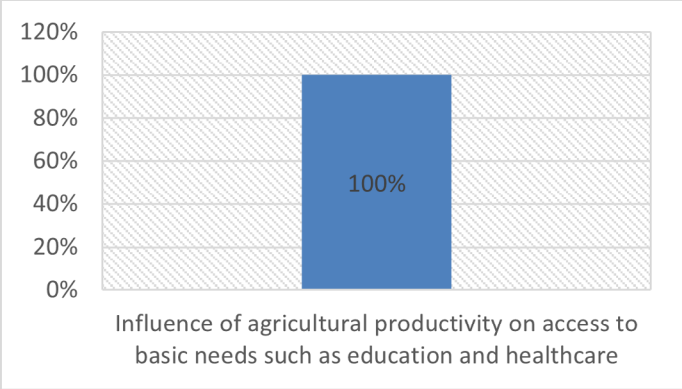

Figure 3. Influence of agricultural productivity on access to basic needs such as education and healthcare

The chart gives information on the Influence of agricultural productivity on access to basic needs such as education and healthcare, of which 100% of the respondents said that agricultural productivity does influence their access to basic needs.

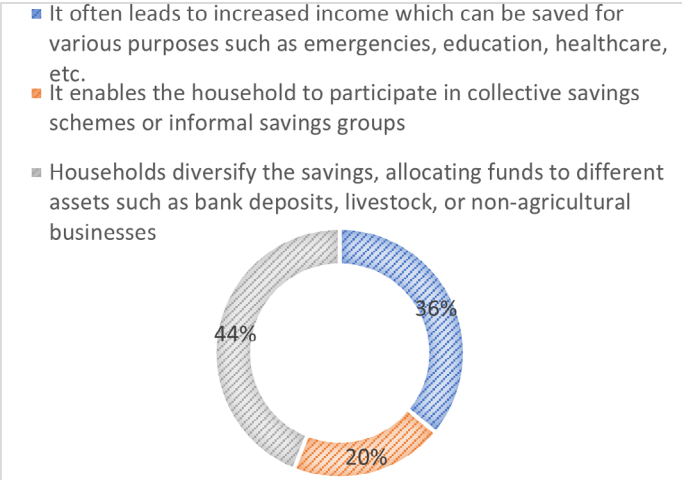

Figure 4. Household saving patterns in response to agricultural productivity

The farmers were asked on the household saving patterns in response to agricultural productivity. 36% of the respondents said that it often leads to increased income which can be saved for various purposes such as emergencies, education, health care, or investment in farm infrastructure and technology, 20% said that it enables the household to participate in collective savings schemes or informal savings groups, pooling resources to support community development projects or mutual financial assistance, and 44% said that households diversify the savings, allocating funds to different assets such as bank deposits, livestock, or non-agricultural businesses to reduce risk and maximize returns.

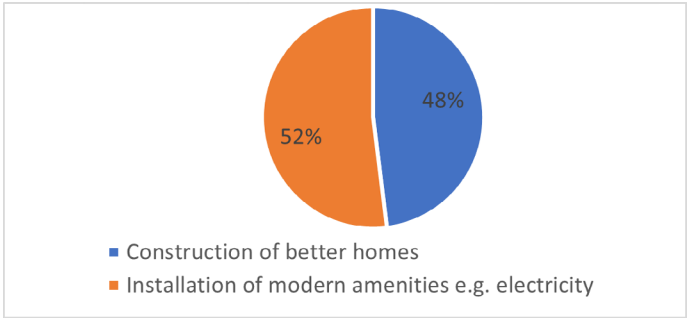

Figure 5. Agricultural productivity and housing conditions

The information above represents the influence of agricultural productivity on housing conditions. 48% of which influenced the construction of better homes, and 52% influenced the installation of modern amenities such as electricity.

Thematic area 2: agricultural productivity and family investments.

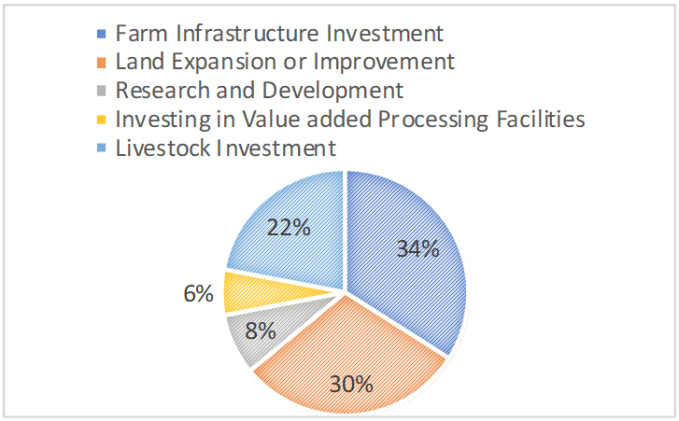

Figure 6. Types of investments with increased agricultural productivity

The respondents were asked the types of investments they made with increased agricultural productivity. 34% invested in farm infrastructure, 30% invested in land expansion or improvement, 8% invested in research and development, 6% invested in value added processing facilities, and 22% invested in livestock.

The respondents were asked how agricultural productivity influences their allocation of financial resources towards education and healthcare investments for family members. 32% agreed that it enables families to afford health insurance coverage, 22% agreed that it provides families with means to

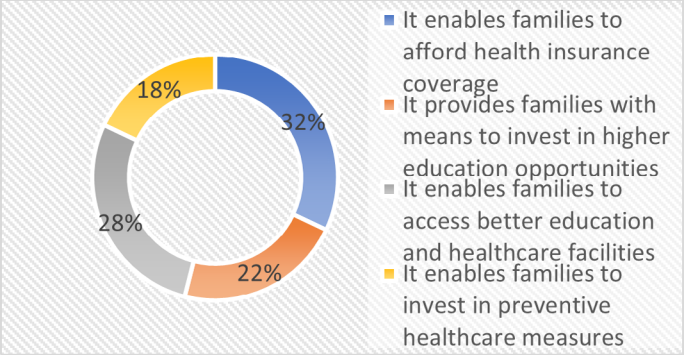

Figure 7. Agricultural productivity and its influence on education and healthcare investments

invest in higher education opportunities, 28% agreed that it enables families to access better education and healthcare facilities, and 18% agreed that it enables families to invest in preventive healthcare measures.

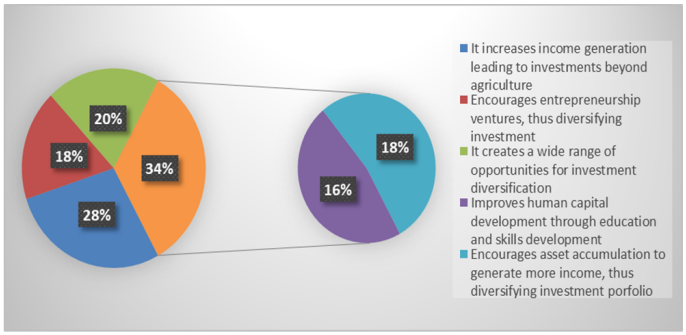

Figure 8. Agricultural productivity and diversification of family investment

The figure above represents the farmers' responses to the ways in which agricultural productivity influences the diversification of family investments. 28% said it increase income generation leading to investments beyond agriculture, 18% said it encourages entrepreneurship ventures, thus diversifying investments, 20% said it creates a wide range of opportunities for investment diversification, 16% said it improves human capital development through education and skills development, and 18% said it encourages asset accumulation to generate more income, thus diversifying investment portfolio.

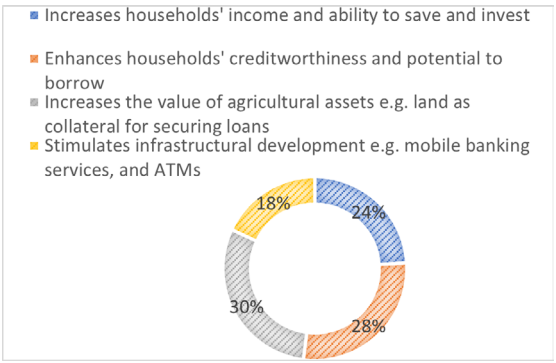

Figure 9. Role of agricultural productivity in enhancing access to financial services for households

Above is the farmers' responses on the role of agricultural productivity in enhancing access to financial services for households. 24% said that it increases households' income and ability to save and invest, 28% said it enhances households' creditworthiness and potential to borrow, 30% said it increases the value of agricultural assets e.g. land as collateral for securing loans, and 18% said it stimulates infrastructural development e.g. mobile banking services, and ATMs.

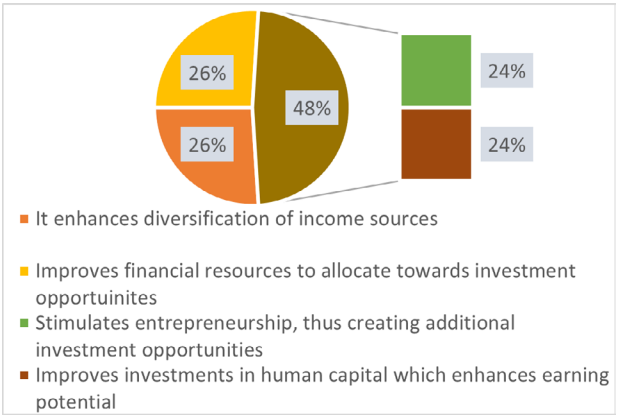

Figure 10. Role of agricultural productivity in enhancing access to investment opportunities for households

The farmers' were asked on the role of agricultural productivity in enhancing access to investment opportunities for households. 26% responded that it enhances diversification of income sources, 26% responded that it improves financial resources to allocate towards investment opportunities, 24% responded that it stimulates entrepreneurship, thus creating additional investment opportunities, and 24% responded that it improves investments in human capital which enhances earning potential.

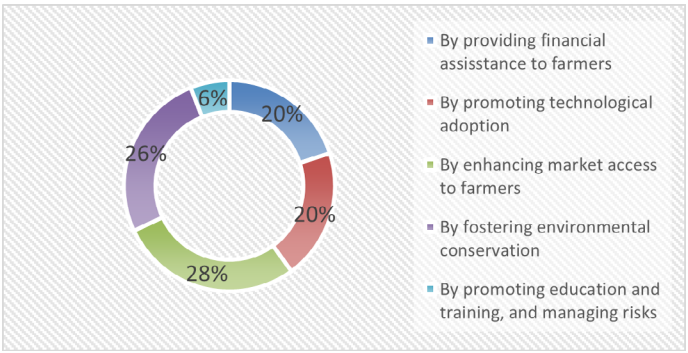

Figure 11. Government support programs' influence on the link between improved agricultural productivity and family investments

The figure above shows the farmers' responses on how they perceive the influence of government support programs on the link between agricultural productivity and family investment. 20% said by providing financial assistance to farmers, 20% said by promoting technological adoption, 28% said by enhancing market access to farmers, 26% said by fostering environmental conservation, and 6% said by promoting education and training,

and managing risks.

Thematic area 2: improved agricultural productivity and household food consumption patterns

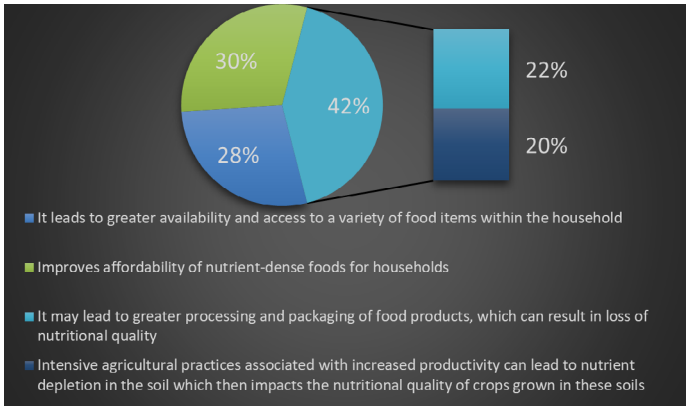

Figure 12. Agricultural productivity and quality of food consumption within the household

The figure shows the farmers' responses on the influence of agricultural productivity on nutritional quality of food consumption within the households. 28% said it leads to greater availability and access to a variety of food items within the household, 30% said it improves affordability of nutrient-dense foods for households, 22% said it may lead to greater processing and packaging of food products, which can result in loss of nutritional quality, and 20% said it leads to intensive agricultural practices associated with increased productivity which can lead to nutrient depletion in the soil which then impacts the nutritional quality of crops grown in these soils.

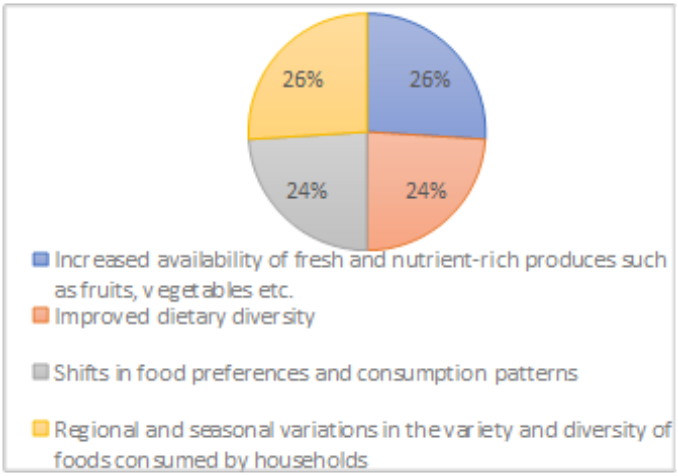

Figure 13. Changes in variety and diversity of food items consumed

The figure above illustrates the farmers' responses on the changes in the variety and diversity of food items consumed as a result of improved agricultural productivity. 26% said it leads to increased availability of fresh and nutrient-rich products such as fruits, vegetables etc. 24% said it leads to improved dietary diversity, 24% said it leads to shifts in food preferences and consumption patterns, and 26% said it leads to regional and seasonal variations in the variety and diversity of foods consumed by the households.

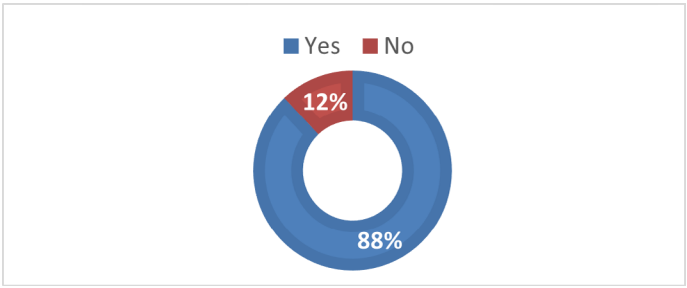

Figure 14. Agricultural productivity and its effects on the frequency and adequacy of meals

The chart above shows the effects of agricultural productivity on the frequency and adequacy of meals. 88% of the respondents said yes to agricultural productivity affecting the frequency and adequacy of meals, and 12% said no to agricultural productivity affecting the frequency and adequacy of meals.

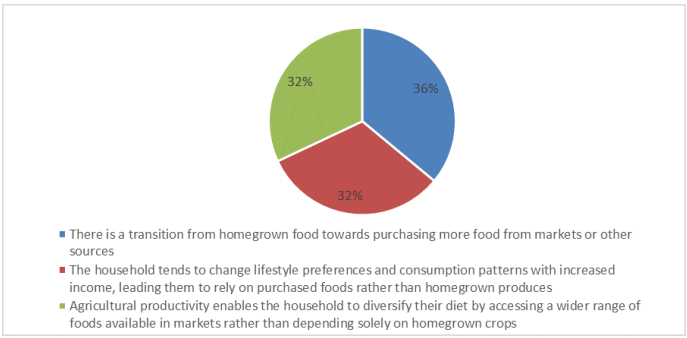

Figure 15. Shift that occurs in the sourcing of food (homegrown vs purchased) with increased agricultural productivity.

The chart presents the shift that occurs in the sourcing of food (homegrown vs purchased) with increased agricultural productivity. 36% of the respondents said there is a transition from homegrown food towards purchasing more food from markets or other sources, 32% said the households tend to change lifestyle preferences and consumption patterns with

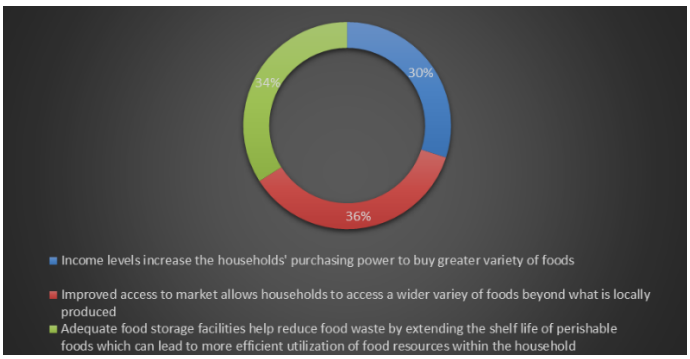

Figure 16. How income levels, access to markets, and food storage facilities mediate the relationship between improved agricultural productivity and household food consumption patterns

increased income, leading them to rely on purchased foods rather than homegrown produces, and 32% said agricultural productivity enables the households to diversify their diet by accessing wider range of foods available in markets rather than depending solely on homegrown crops.

The chart shows farmers' responses on how factors such as income levels, access to markets, and food storage facilities mediate the relationship between improved agricultural productivity and household food consumption patterns. 30% of them said income levels increase the households' purchasing power to buy greater variety of foods, 36% said improved access to market allows households to access a wider variety of foods beyond what is locally produced, and 34% said adequate food storage facilities help reduce food waste by extending the shelf life of perishable foods which can lead to more efficient utilization of food resources within the households.

Figure 17. Implications of agricultural productivity on household expenditure pattern related to food

Above is information on the farmers' responses on the implications of improved agricultural productivity on household expenditure patterns related to food. 38% said the household tends to shift its food purchasing habits by prioritizing the purchase of higher quality or more diverse food items that were previously unaffordable, 30% said the household may have opportunities to save or invest the money they would have spent on food, and 32% said it leads to increased investments in nutrient-rich foods.

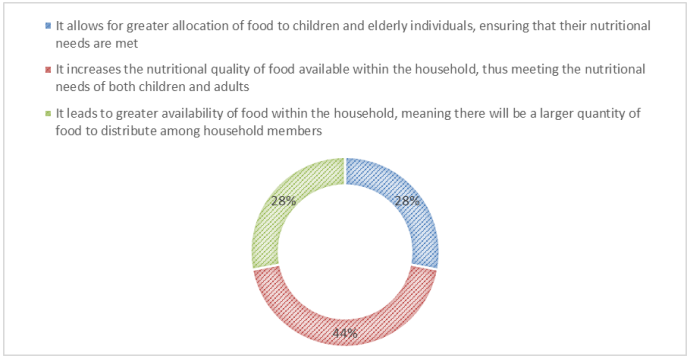

Figure 18. Effects of increased agricultural productivity on the distribution of food within the household

The information above is the response of farmers on the effects of increased agricultural productivity on the distribution of food within the household. 28% said that it allows for greater allocation of food to children and elderly individuals, ensuring that their nutritional needs are met, 44% said it increases the nutritional quality of food available within the household, thus meeting the nutritional needs of both children and adults, and 28% said it leads to greater availability of food within the household, meaning there will be a larger quantity of food to distribute among household members.

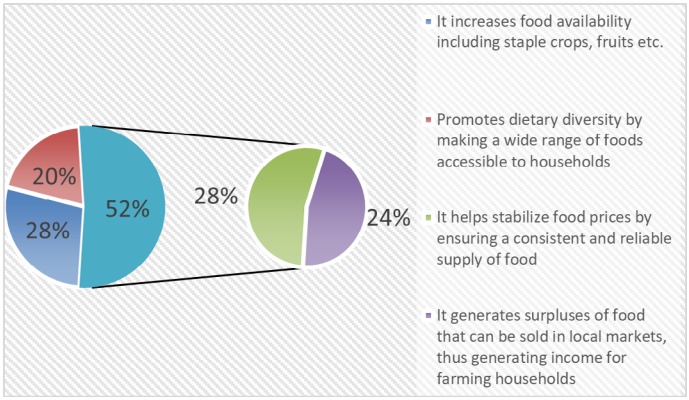

Figure 19. Role of agricultural productivity in reducing food insecurity and malnutrition

The chart presents the farmers' understanding of on role of agricultural productivity in reducing food insecurity and malnutrition within the household. 28% said it increases food availability including staple crops, fruits etc. 20% said it promotes dietary diversity by making a wide range of foods accessible to households, 28% said it helps stabilize food prices by ensuring a consistent and reliable supply of food, and 24% said it generates surpluses of food that can be sold in local markets, thus generating income for farming households.

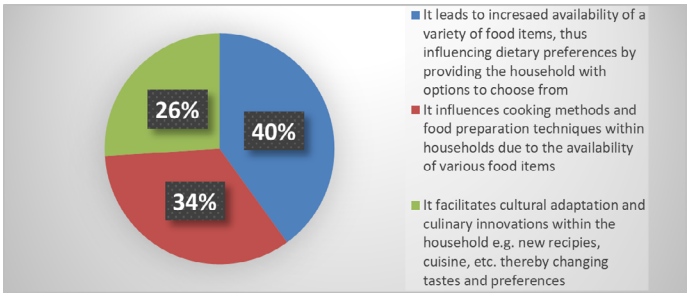

Figure 20. Improved agricultural productivity's influence on dietary preferences and cultural food practices

The chart show the farmers' responses on the influence of agricultural productivity on dietary preferences and cultural food practices within the household. 40% said it leads to increased availability of a variety of food items, thus influencing dietary preferences by providing the households with options to choose from, 34% said it influences cooking methods and food preparation techniques within households due to the availability of various food items, and 24% said it facilitates agricultural adaptation and culinary innovations within the households, e.g. new recipes, cuisines, etc. thereby changing tastes and preferences.

4.4. Discussion

Thematic area 1: effects of agricultural productivity on household living conditions

From the findings, it has been proven that agricultural productivity can and does improve income levels of farming households by increasing yields and livestock, through diversification of crops and livestock, and through the creation of more jobs for agricultural sector. Agricultural productivity, based on the findings above, leads to improvements in the economic wellbeing of the farming households as it leads to increased income which can be spent on other goods and services thus stimulating economic activities, it reduces poverty levels by providing greater opportunities for employment and income generation for the peoples especially those whose lives depend on agriculture, and also through enhancing food security (by improving the availability of food and the households' ability to access and afford various nutritious food items needed for good health for an active and productive life) and spurring of rural development through job creation thus stimulating infrastructure investment and promoting growth of related industries. It has also been discovered that increased agricultural productivity influences the respondents' access to basic needs such as education and healthcare services by improving and influencing the saving and investment patterns of the respondents. Agricultural productivity has also evidently influenced the housing conditions of the respondents, their overall standard of living (through improved income, improved social mobility, improved access to basic needs, and increased food production and food security), and has influenced the employment dynamics for farming households (by allowing respondents to invest in education and skills development, increased demand for labor, and by enabling households' to diversify their sources of income beyond agriculture).

Thematic area 2: agricultural productivity and family investments

Increases in agricultural productivity have led to improved types of investments for farming households (such as land expansion, farm infrastructure investment, research and development etc.), it influences the allocation of financial resources towards education and healthcare, influences the diversification of family investments, affects decision-making process regarding long-term investments such as property or business ventures, and enhances access to financial services. It also enhances access to investment opportunities. Government policies and support programs also influence the link between agricultural productivity and family investments.

Thematic area 3: agricultural productivity and food consumption patterns

Agricultural productivity, as shown from the findings, influences the nutritional quality of food consumption within households, leads to changes in the variety and diversity of food items consumed, affects the frequency and adequacy of meals within the household, and causes shifts in the sourcing of food (homegrown vs purchased). Factors such as income levels, access to markets, and food storage facilities mediate the relationship between improved agricultural productivity and household food consumption patterns, and agricultural productivity leads to some implications on households' expenditure pattern related to food. Increased agricultural productivity seemingly affects the distribution of food within the households, it plays a role in reducing food insecurity and malnutrition within the households, and it influences dietary preferences and cultural food practices within the household.

Overall, it is evident from the above data analysis that agricultural productivity has effects on household living conditions. Agricultural productivity affects and influences the household's saving patterns, investment patterns, food consumption patterns.

5. CONCLUSION

Overall, it has been evidently discovered that increased agricultural productivity has effects on the living conditions of many households. Though some effects may be negative, most of them are positive. It is therefore imperative or important for the government to increase its influence on and support to farmers so as to help improve and increase most farmers' agricultural productivity. The governments of each country, especially developing and less developed countries, should encourage and support sustainable agricultural practice which would improve productivity gains while preserving the environment for future benefits. Despite improvement in agricultural productivity in many countries, people still wallow in extreme poverty. This simply shows that there is no efficient and effective trickle-down effect of the benefits of agricultural productivity to the poorest of the poor and thus poverty is not being alleviated because only a small margin of the people enjoy the benefits of improved agricultural productivity. Despite the efforts by the governments of many different countries of supporting small scale farmers through policy development and implementation, not much change and growth has been seen in the country. This is because these strategies, policies, and interventions are not effectively implemented. Most farmers do not have access to the inputs from the farmer support programs and some mostly receive their inputs and resource late which hinders them from planting the crops because the suitable planting time would have already passed. This, therefore reduces agricultural yields of that particular year.

RECOMMENDATIONS

Developing and implement more effective policies that will promote sustainable agricultural practices to improve productivity while preserving the environment for future generations.

The government should develop and implement policies that will ensure effective and efficient trickle down of gains and benefits of agricultural productivity to the poorest in the populations.

The government should ensure the effective implementation of farmer support programs such as FISP and E-voucher so as to support and promote increased agricultural productivity for all.

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