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International Journal of Educational Excellence and Innovation
10.5281/zenodo.14870669 Vol. 02 Issue 02 Feb - 2025 Manuscript ID: #56

SOYA BEANS PRODUCTION AND RURAL LIVELIHOODS: A CASE STUDY OF NTATUMBILA VILLAGEOF NAKONDE DISTRICT, ZAMBIA

By

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Abstract

Rural societies have remained underdeveloped and impoverished due to challenges in generating the income necessary to improve their well-being. Traditionally, these communities consist of small holder farmers who primarily grow crops that only meet their subsistence needs. However, the cultivation of soya beans in rural areas has been argued to significantly enhance livelihoods. Soya bean farming has enabled small-scale farmers to diversify into growing additional crops, which have generated extra income for improved infrastructure, access to quality healthcare, and enhanced food security in rural communities. This study found that soya bean cultivation has the potential to uplift the rural livelihoods of small-scale farmers, largely due to its high market value. This market advantage has allowed farmers to diversify their agricultural activities, leading to broader improvements in community well-being. In Ntatumbila village, increased soya bean cultivation among small-scale farmers has resulted in higher income, better nutrition, affordable livestock feed, and improved housing infrastructure. The study concluded that soya bean cultivation holds significant potential to enhance rural livelihoods and food security. It called for coordinated efforts by the Ministry of Agriculture, civil society organizations focused on climate change, agro-financial institutions, and agro-dealers to develop strategies that support small-scale farmers in expanding soybean production to improve rural livelihoods and food security.

Keywords: Soya beans, small-scale farmers, livelihoods, rural community, food security

How to cite: Jackson Nyirenda, Brivery Siamabele, Valentine Kalonje, Themba Mapulanga, & Rudo Phiri Mumba... (2025). SOYA BEANS PRODUCTION AND RURAL LIVELIHOODS: A CASE STUDY OF NTATUMBILA VILLAGEOF NAKONDE DISTRICT, ZAMBIA. International Journal of Educational Excellence and Innovation, Volume-02 | Issue-01, Page 1-19. https://zenodo.org/records/14870669

1. INTRODUCTION

Soya beans are a significant agricultural crop, recognized globally for their role in food security and economic development. Originating from East Asia, soya beans have become a staple in numerous countries due to their high protein content and versatility in both food and industrial applications. In recent years, their cultivation has expanded into various regions, including Africa, where they are being increasingly adopted for their potential to enhance agricultural productivity and rural livelihoods.

In Zambia, soya beans production is emerging as a critical agricultural activity. The country's diverse agro-ecological zones provide favorable conditions for soybean cultivation, which has led to an increase in both smallholder and commercial farming. Soya beans contribute to soil fertility through nitrogen fixation, making them an important crop in rotation systems and sustainable agricultural practices. Furthermore, the crops high market value offers farmers a viable income source, which presents an opportunity to address the economic challenges faced by many smallholder farmers.

Agriculture plays an important role in fostering Zambia’s socio-economic development and accounts for about 57.31% of employment (Trading Economics, 2024). Zambia’s rural population, which constitutes 54% of the nation’s demographic, represents the largest segment of the population and continues to be central to the country’s agricultural sector. A large section of the rural population depends on agriculture for income and food, primarily through smallholder production (Africa Development Bank, 2023). Many rural households engage in subsistence farming, growing crops such as maize, cassava, millet, and sorghum usually for home consumption, and selling which often provides insufficient income to meet their needs (Food and Agriculture Organization, 2018). Siamabele and Manda (2024) are of theview that enhancing agricultural productivity and diversifying crop production can significantly improve these households' economic conditions. Soya bean cultivation has the potential to significantly improve the well-being of vulnerable populations by enhancing their livelihood activities and improving the nutritional status of rural communities (Siamabele and Moral, 2021). With its high market value and potential for substantial yields, soya bean farming offers a promising avenue for rural development. The increased production of livestock has led to a growing demand for soya beans as livestock feed, positioning it as a key equalizer in terms of cash flow for small-scale farmers, especially when compared to maize and other crops (Siamabele, 2019). Despite its drought tolerance, soya bean production has encountered numerous challenges, including the adverse effects of climate change, inadequate road and storage infrastructure, and a lack of resources and market access (FAO, 2018).

2. RESEARCH CONTEXT

Rural societies have historically remained underdeveloped and impoverished due to a lack of capacity to generate sufficient income to enhance their well-being (United States Department of Agriculture, 2023). Traditionally, these communities comprised peasant farmers who focused primarily on subsistence crops that only met their immediate food needs. Despite engaging in supplementary income-generating activities such as charcoal production, brick making, carpentry, and various piecework, their economic status remained largely stagnant. For communities like Ntatumbila, improving livelihoods necessitated a shift towards viewing agriculture as a business. This shift encouraged the cultivation of high-value, low-labor crops

capable of competing in both local and international markets, thereby raising living standards and increasing national revenue.

The Ntatumbila community had been practicing traditional agriculture for an extended period. Small-scale farmers, representing approximately 70 percent of Zambia's agricultural producers, typically engaged in subsistence farming with occasional marketable surpluses (International Trade Administration, 2022). Despite their significant role, these farmers remained impoverished due to poorly coordinated cultivation and marketing methods. Small-scale farmers in many developing countries faced challenges in benefiting from their sales, despite being the primary agricultural actors (World Food Programme, 2015). Nonetheless, there was potential for these farmers to expand their production of cash crops with strong market demand locally and internationally.

Ntatumbila, situated near the border between Zambia and Tanzania, is strategically positioned for trade. Traders from Kenya, Burundi, Rwanda, Uganda, Somalia, and Djibouti travel to Nakonde District to purchase soya beans, maize, and sorghum for export. Locally, a cooking oil production plant in Nakonde District required 35,000 metric tons of soybeans from local farmers, including those in Ntatumbila. Achieving this goal depended on the implementation of effective soya bean cultivation practices, including proper input management and resource utilization.

The rise in soya bean production resembled the characteristics of a "boom crop," a term defined by Junquera et al. (2024) to describe crops experiencing intensive expansion or rapid production increases and extensive land conversions. Soya bean, often referred to as the "Golden Bean" of the 20th century due to their high nutritional value and protein content (40-43%), have become an attractive crop for economic, social, and environmental reasons. Soya bean protein is notable for retaining its integrity during processing, making soya bean products an excellent source of quality protein, oil, and minerals (Sivashakari et al., 2021).

Zambia has substantial potential to increase soya beans production, enhancing its role in economic development and rural food security (Ministry of Agriculture, 2019). Despite the growth in soya bean cultivation, there has been limited discussion on how this crop can improve the livelihoods and food security of small-scale farmers in sub-Saharan Africa, including Zambia. This is largely due to the persistence of subsistence farming practices despite favorable climatic conditions, fertile land, and market access (Siamabele, 2019).

3. RESEARCH METHODS

This study was conducted in Ntatumbila Village, located in Nakonde District of Muchinga Province in the Republic of Zambia, situated in southern Africa. The village is predominantly a farming community consisting of small-scale farmers who primarily grow crops for subsistence. The selection of this area was based on recommendations from Ministry of Agriculture officers and its distinction as one of the regions with a notable number of small-scale farmers engaged in soybean cultivation compared to other parts of the district. Consequently, Ntatumbila Village was deemed an ideal location for this study due to the homogeneity in farming practices observed within the community.

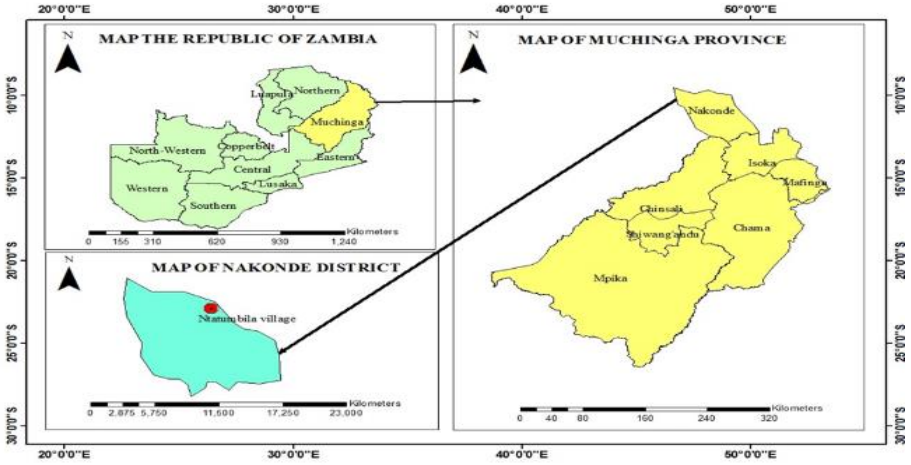

Figure 1: *Study Area Map*

In this study, both simple random sampling and purposive sampling methods were employed (BYJU'S, 2024; Fleetwood, 2024). The study focused on a population of 100 individuals within the community. A sample size of 50 small-scale farmers, 3 agro-dealers, and 5 Ministry of Agriculture officers was selected. The sample size was determined using Slovin's formula, as detailed below:

$n=100/ (1+Ne^2)$

n= Sample size

Expected level of accuracy = 90%

100-90=10%, e= 10/100

$n=100/ (1+Ne^2)$ e=0.1

Therefore,

$n=100/ (1+100x0.1^2)$, n=

n=100/1+100x0.01)

n=100/1+1, n=100/2, n**=50**

A sample size of 50 small-scale farmers was selected, representing half of the total 100 farmers in the village. This group included men, women, and youth from the community, ensuring a well-rounded collection of data for the study.

Data collection methods included Focus Group Discussions, Interviews, and Questionnaires. Qualitative data was analyzed using a thematic analysis approach, while quantitative data was coded to allow for precise findings. Excel was utilized for visualizing and analyzing the quantitative data through graphs and tables.

The research adhered to key ethical principles, including informed consent and voluntary participation. Permission to conduct the study was obtained from the village headman of

Ntatumbila and the District Agriculture Officer in Nakonde District, Muchinga Province, Zambia.

RESULTS

Characteristics of Respondents

This study involved 50 respondents selected through simple random sampling from Ntatumbila Village in Nakonde Constituency. Understanding gender disparities among small-scale farmers was crucial to determine who primarily engaged in soya bean cultivation and how this affected their livelihoods and food security.

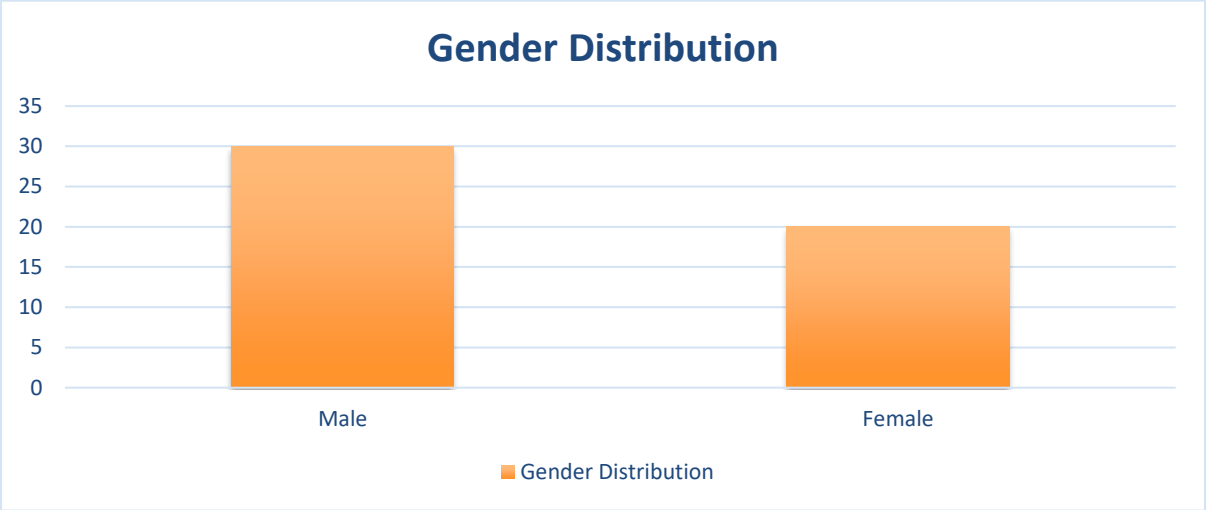

***Figure 1**: Gender Distribution*

As shown in the figure, 30 respondents were male, while 20 respondents were female. The data revealed that 40% of the female respondents were actively involved in small-scale farming, alongside 60% of the male respondents. This distribution indicates that women played a significant role in farming decisions and contributed to household sustenance. Despite men owning a larger share of land in the community, women also possessed land assets, which could serve as collateral for accessing loans.

Education Level of the Small-scale farmers

This study sought to understand the education levels of small-scale farmers who participated in the survey. The findings revealed that a significant majority of the respondents had attained education up to basic level, while a smaller portion had reached secondary education. The educational attainment of small-scale farmers is a critical factor influencing their farming practices, decision-making processes, and overall productivity. The respondents highlighted that education provided them with an opportunity to negotiate on the market when setting prices for their commodities. This study assessed the education levels of the respondents, revealing a predominance of basic education among the participants. The data indicated that: A substantial 80% of the respondents have completed education between 7th and 9th grade. The remaining 20% of the respondents have attained education between 9th and 12th grade. These findings suggest that while the majority of small-scale farmers possess foundational education, a smaller segment has progressed to more advanced levels of education. This distribution of educational attainment may have significant implications for the adoption of innovative agricultural techniques and the implementation of sustainable farming practices.

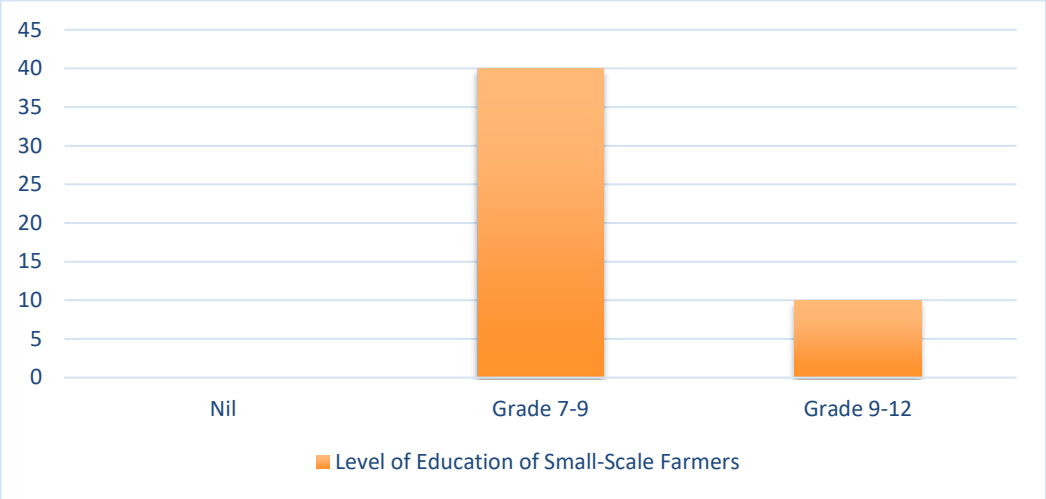

Figure 2: *Level of education of small-scale farmers*

The study revealed that those who had attended secondary education between 9th and 12th grade were better placed to understand the best methods of farming through training offered by the extension officers as well as creating linkages with other small-scale farmers to learn, form cooperatives and access support in the farming.

Soya beans production and rural livelihoods

Before the cultivation of soya beans

Interviews with participants revealed that the cultivation of soybeans among small-scale farmers in Ntatumbila Village was initially limited, with maize and other crops dominating agricultural activities. Small-scale farmers reported that the income generated from selling maize to the Food Reserve Agency (FRA) within the community was insufficient to adequately support their families, as maize did not command a high price on the market. Although soybeans had a higher market value compared to maize, their production was minimal due to challenges in accessing necessary inputs, which prevented farmers from expanding their cultivation of this crop.

As depicted in the figure below, maize accounted for approximately 80% of the crops grown in the area, making it the most widely cultivated crop in the community. Maize was the staple food in all households, and its readily available market, both from the FRA and local traders, incentivized farmers to prioritize its cultivation to secure income for their families. While cassava, sorghum, and soybeans were also grown in the community, soybeans had a higher market value than both sorghum and maize. However, only 20% of farmers were able to find a market for their soybeans, largely due to the strong market presence of maize and groundnuts.

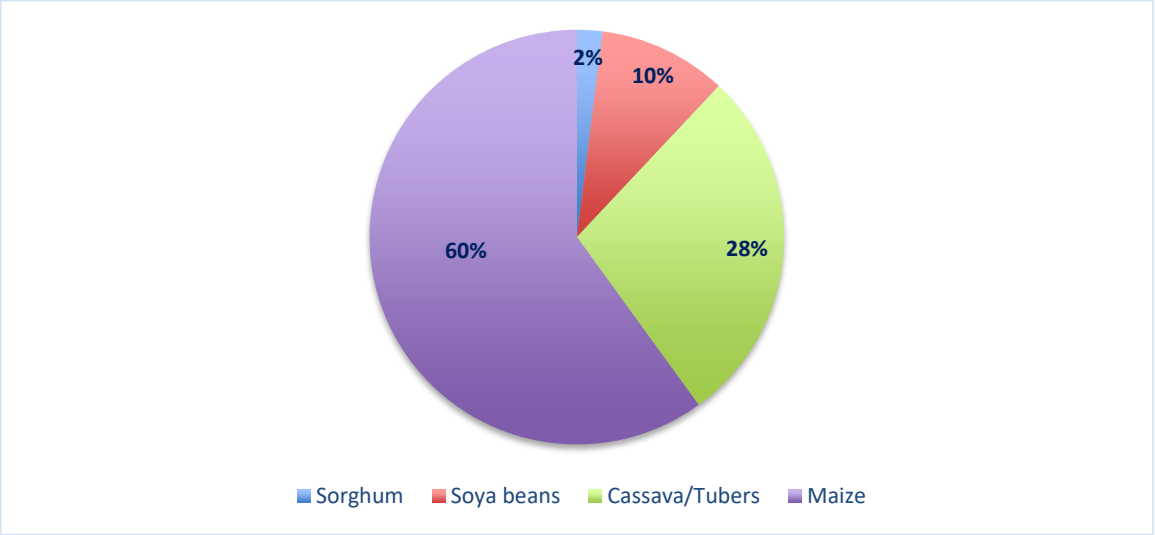

Figure 3: *Rural livelihoods before soya beans cultivation*

The growing demand for soybeans in the market, coupled with its versatile use in households, has significantly improved food livelihoods among small-scale farmers in Ntatumbila Village. Farmers not only used soybeans as a food source but also benefited from the additional income generated by selling the crop. This income allowed them to purchase a variety of nutritious foods that were previously unaffordable when they relied solely on maize and other less valuable crops. The figure below illustrates the improved livelihoods as reported by the participants.

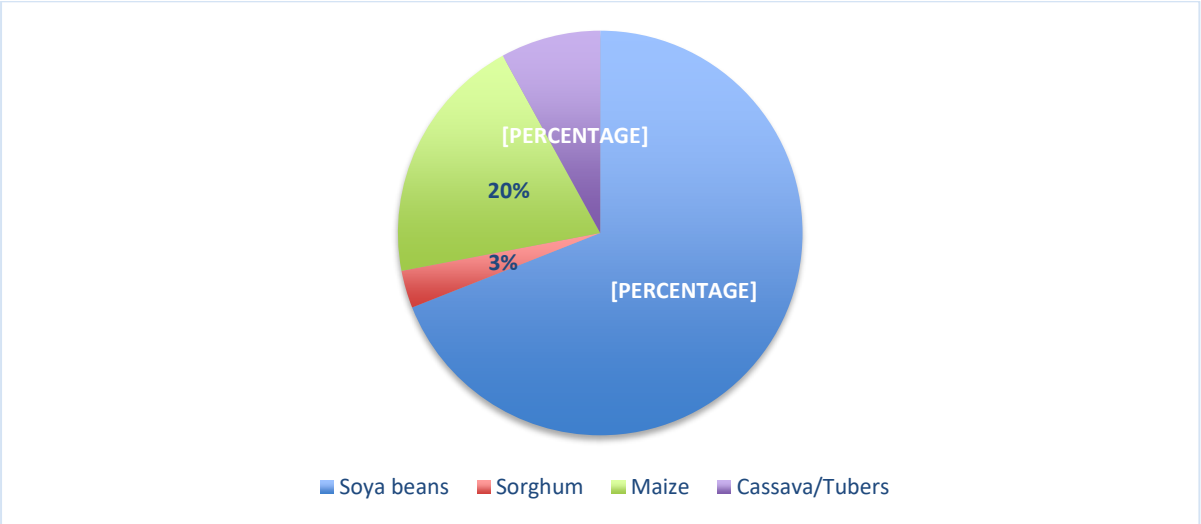

Figure 4: *Rural livelihoods after soya beans cultivation*

The findings indicate that the increased production of soybeans among small-scale farmers has had a positive impact on both rural livelihoods and food security in Ntatumbila Village. The transition from primarily maize cultivation to the inclusion of soybeans has provided households with a more stable and diverse food supply, thereby enhancing their overall well-being.

Competitive prices

The findings revealed that Soya beans are recognized locally as an affordable source of protein due to their diverse household uses. Respondents noted that soya beans performed favorably in terms of pricing compared to other locally grown crops such as maize,

groundnuts, sorghum, and cassava. This position was further confirmed by one of the participants in the study who highlighted that:
"We do sale soya beans at good prices if only the demand on the market is high. But when it comes to comparing the prices of soya beans to other crops like maize, sorghum and cassava, even when prices of soya beans are low, it gives me at least an extra income as compared to when I sale maize or sorghum."

Before the prominence of soya beans cultivation among small-scale farmers, maize and groundnuts were the primary sources of income. As illustrated in Figure 7, data from 50 respondents indicated that 65% of those engaged in maize cultivation reported higher incomes. Groundnuts, cultivated by 30% of respondents, generated the second highest income. In contrast, soya beans, cultivated by only 15% of the respondents, contributed minimally to income generation.

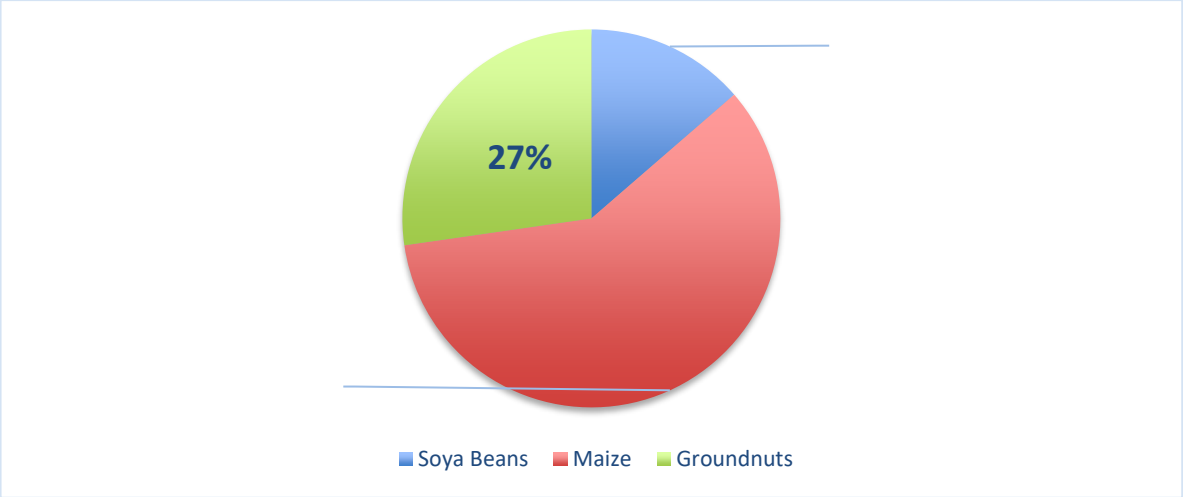

Figure 5: *Income generation before soya beans cultivation*

With the increase in soya beans cultivation, there has been a notable rise in income for households involved in this activity. Figure 8, demonstrates that soya beans command a higher market price compared to maize and groundnuts, leading to increased income for those engaged in its cultivation.

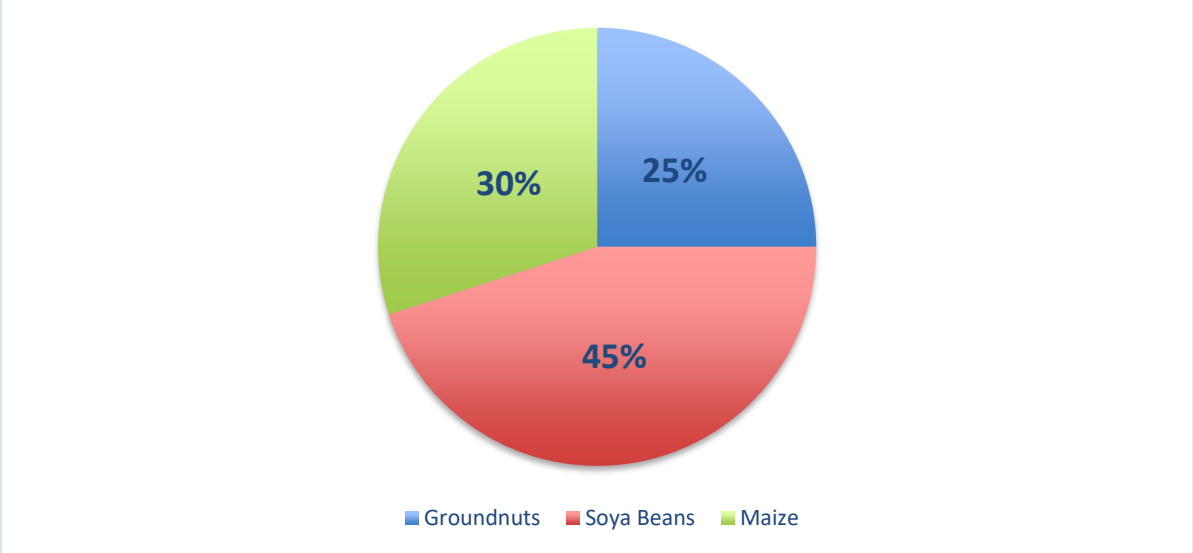

Figure 6*: Increased income in soya beans after an increase in cultivation.*

Approximately 45% of respondents involved in soya beans cultivation experienced an increase in income compared to those cultivating maize and groundnuts. Similar views were obtained from the interviews were one of the participants highlighted that:

"Soya beans have a good income as compared to maize and other crops grown in the area because the price for soya beans is good at the black market and normally it is almost double the prices of maize and groundnuts."

This rise in income has significantly impacted households' access to essential social services, including health and education, as small-scale farmers are now better equipped to cover related expenses. This shift underscores the potential of soya beans to enhance economic stability and improve quality of life for small-scale farmers.

Benefits of Soya Beans production.

In terms of benefits derived from the cultivation of soya beans, 60% of the respondents indicated that apart from maize which was mostly cultivated, soya beans showed that had a lot of benefits to the farmers.

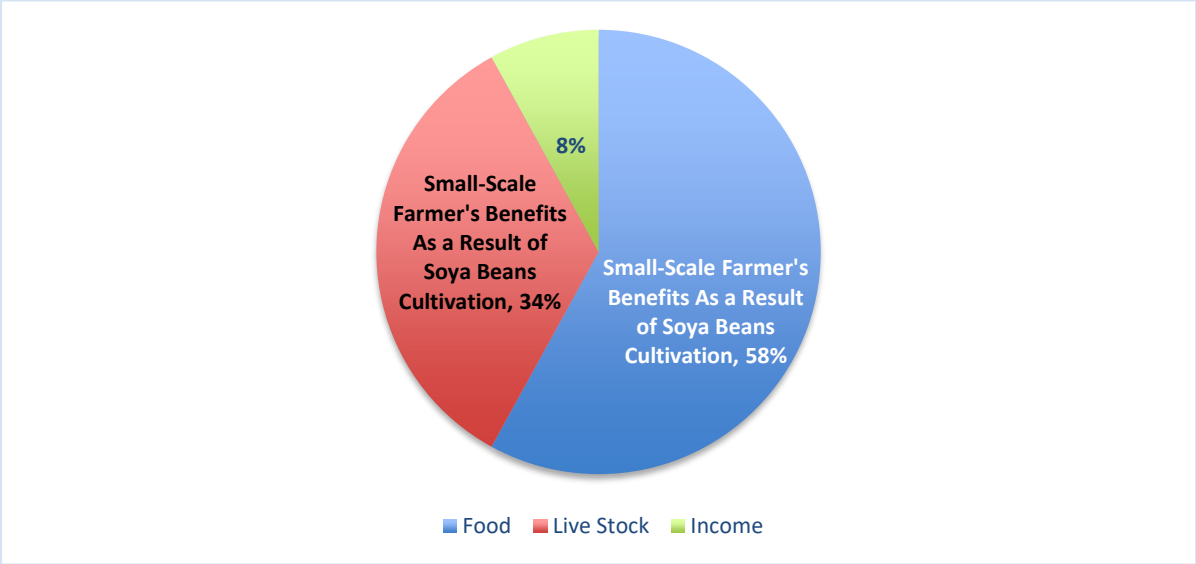

***Figure 7**: Small-scale farmer's benefits as a result of soya beans cultivation*

From the figure above, 34% of those in livestock farming, such as pig, goat and chicken rearing got feed for their livestock from soya beans which they processed locally to make feed. Further, 58% said that through trainings offered to them, they made cooking oil and sometimes used it as part of the meal. In terms of income generation, they said that though maize had readily available market from Food Reserve Agency (FRA), soya beans had a better income and only 8% of these farmers had extra income from soya beans cultivation. This was because soya beans were sold at a higher price despite not having a good market. It was highlighted that soya beans were able to improve the food security of the people because in terms of feeding, those who cultivated soya beans had an improvement in their daily dietary needs because they were able to afford two to three meals a day due to an extra income generated from soya beans. Given the right market, support in terms of finance, training, seed chemicals and the right rainfall pattern mostly experienced in the community, soya beans were capable of improving the living standards of the small-scale farmers.

"Before I started growing soya beans, my income was very small because we only cultivated little for our use at home, however a single 10kg bag of soya beans I was given from FISP showed me the need to diversify my farming to soya beans, later I concentrated in growing soya beans side by side with maize which had a nearby market from FRA within the village and then in the following year, I grew soya beans a bit more which has now helped me and my family to have enough food because we can even manage to balance our diet by having a variety of food at home and managing to pay for social amenities without problems as compared to the time when I was just growing maize alone."

Soya beans demand

According to the participants interviewed, while maize was readily available through the Food Reserve Agency (FRA) and local traders, soya beans experienced a high demand from both local and international traders. International traders from countries such as Malawi, Tanzania, Ethiopia, Eritrea, and Somalia, who were active in the district due to its strategic location as a border town, established operations there to procure soya beans from small-scale farmers. These traders purchased soya beans at lower prices from local farmers and sold them at higher prices in international markets. In many cases, soya beans in communities like Ntatumbila were bought even before harvest due to its high demand globally.

In terms of income generation, soya beans had the potential to provide greater revenue for small-scale farmers, especially when grown on a larger scale. For instance, during the 2023 farming season, soya beans were priced at K450 per 50 kg bag, compared to K280 for maize and K300 for groundnuts, reflecting a significant pricing advantage for soya beans.

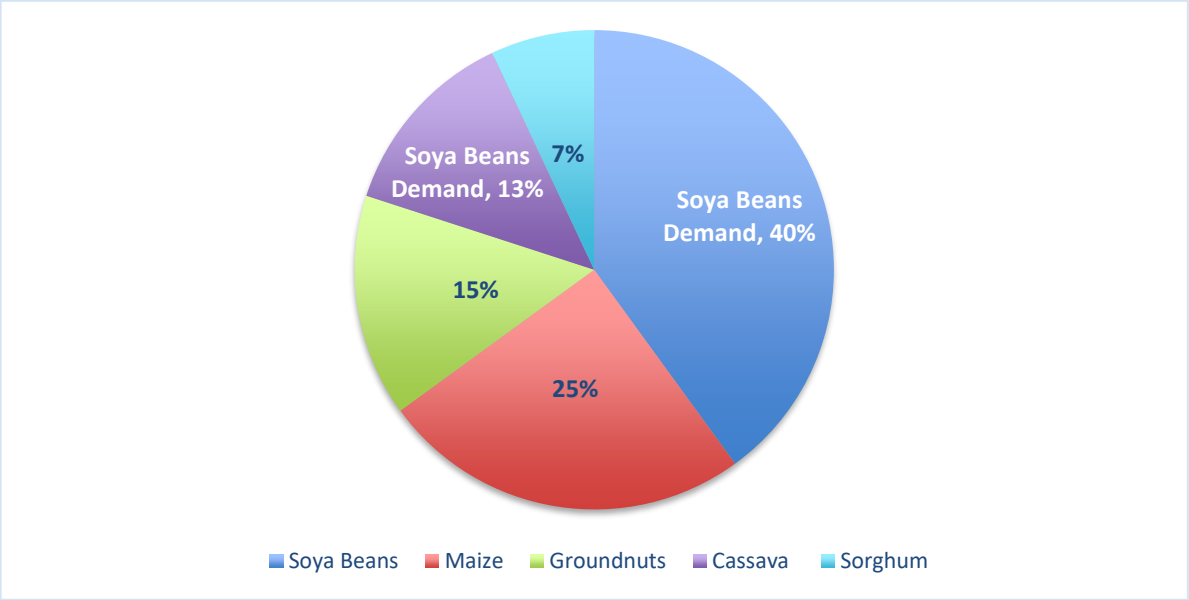

Figure 8: *Soya beans demand*

The figure above illustrates this demand and pricing structure. The figure indicates that with adequate support from the government and agro-supporting institutions, soya beans cultivation could substantially improve small-scale farmers' incomes. One small-scale farmer highlighted in a focus group discussion shared that the income from selling soya beans enabled him to acquire assets such as an iron-sheet roof for his house and new furniture, underscoring the economic benefits of soya beans cultivation.

"I am able to use my resources to cultivate my crops (maize, millet, cassava and soya beans). This is because I get that extra income from soya beans apart from just selling maize which I generally grow and sell to FRA. From my small holder farming, I managed to buy roofing sheets and items in the house such as chairs and a radio."

Food availability

Food availability refers to the consistent supply of sufficient quantities of food that can be easily transported, traded, or purchased. The participants in this study reported that while certain foods such as fruits, vegetables, dairy products, and peanuts were present in the market, they were often difficult for small-scale farmers to obtain. This was primarily due to financial constraints and limited access to markets. However, staple crops like sweet potatoes, cassava, and pumpkins were widely available in the village, as they were commonly cultivated by the farmers.

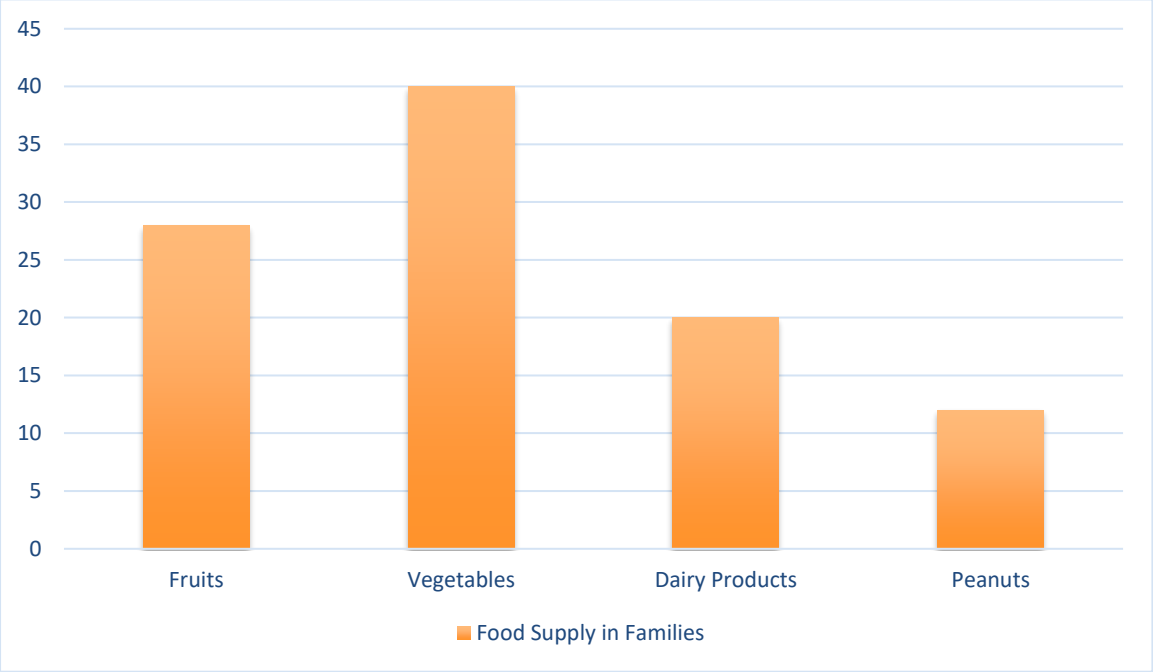

Figure 9: *Food supply in families*

The graph above indicates that vegetables and wild fruits were readily available, reflecting the rural nature of the community. However, other food items such as fruits, dairy products, peanuts, and carbohydrates were only available in the markets, requiring farmers to purchase them for household consumption. One of the participants interviewed highlighted that:

"We grow a lot of vegetables in the field and it helps us because we do not spend a lot of money to buy vegetables in this community just like groundnuts from which we make peanut butter which is locally produced. For the fruits, we obtain them from the bush. For dairy products such as milk and butter we have to get them from the market in the central business district and it was mostly expensive and hard to find by small holder farmers."

Food accessibility

Food accessibility encompasses both physical and economic access to food, influenced by factors such as purchasing power, income levels, transportation, and market infrastructure.

The study's participants highlighted the distribution of food accessibility, as depicted in the following figure.

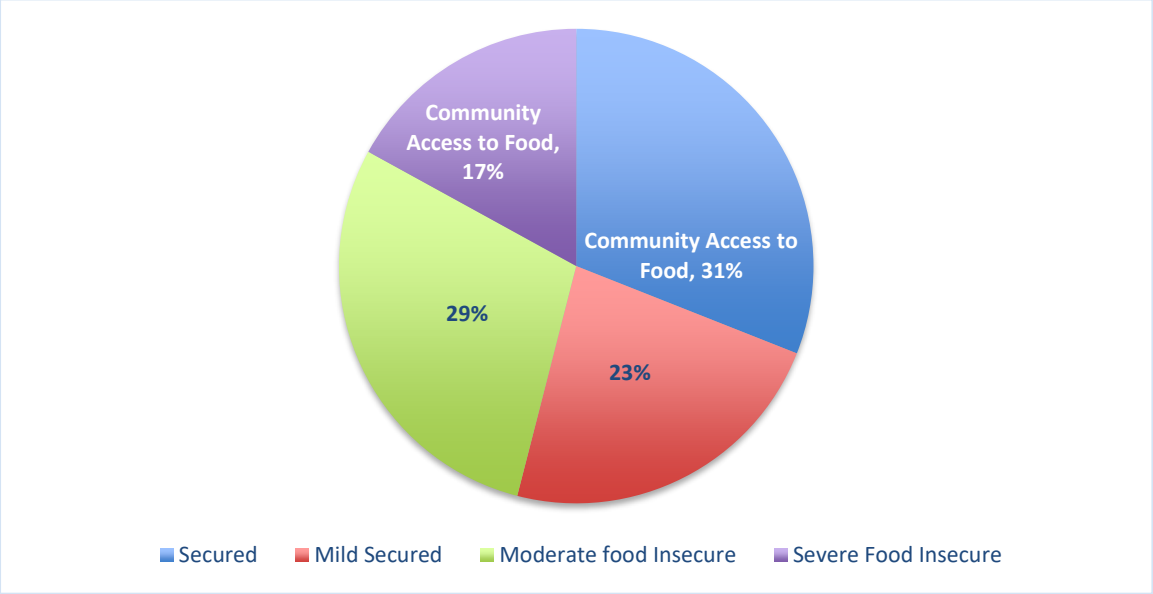

Figure 10: *Community Access to Food*

Food utilisation

The utilization of food, particularly in terms of nutritional quality, emerged as a critical concern among participants. A significant issue identified was the high rate of stunting among children under the age of five, which is indicative of chronic malnutrition. Stunting, resulting from prolonged inadequate food intake and recurrent illnesses, was prevalent in the community. The data revealed that 46.6% of children under five were moderately malnourished and stunted, 22.2% were severely stunted, and 31% were overweight.

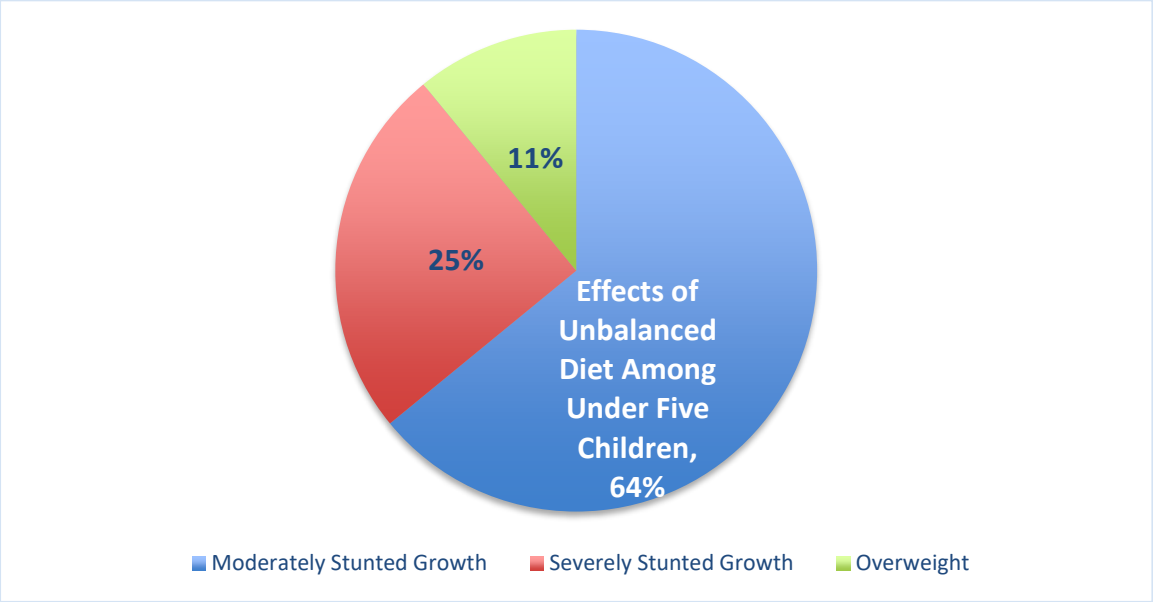

Figure 11: *Effects of unbalanced diet among the under five children in Ntatumbila village.*

The graph above underscores the importance of proper food utilization in ensuring the health and well-being of the population. Malnutrition was particularly prevalent among children in households that did not cultivate soybeans, underscoring the critical role of this crop in improving nutritional outcomes. One of the participants interviewed pointed out that:

"I have had three of my children suffering from lack of food illnesses. Mostly we depend on Nshima which is eaten in the morning as we prepare to go in the field. The next meal which is nshima again is had later in the day around 15:00hrs. This is so because I cannot afford to buy some more food and because of this reason, sometimes we can sleep without eating."

Food Stability

Food stability, which results from consistent availability, accessibility, and utilization, was evident in Ntatumbila Village due to the cultivation of soybeans. The widespread adoption of soybean farming not only improved the nutritional status of farmers but also contributed to economic stability. Farmers who grew soybeans experienced a more stable income, as they diversified their crops and reduced their reliance on maize, the dominant crop in the area. Soybeans provided a crucial supplement to their dietary needs and served as a reliable source of income.

These four pillars—availability, accessibility, utilization, and stability—are integral to the concept of food security. They are essential in ensuring that all individuals in the community have consistent, physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and preferences.

Discussion

Opportunities Realized from Soya Bean Cultivation among Small-Scale Farmers

The research findings indicated that small-scale farmers in rural communities had effectively harnessed soya bean cultivation to generate income opportunities and create direct employment along the local value chain. Contrary to concerns that soya production might displace subsistence crops, evidence from the field suggested that farmers prefer to clear new land for soya while preserving a diverse array of cash and subsistence crops. The practice of rotating soya with maize and other crops has proved to enhance soil fertility and increase maize yields. Small-scale soya farming presents a viable alternative to large-scale agricultural investments, offering significant potential for smallholder farmers in Zambia, particularly in Ntatumbila, to diversify household income and bolster food and nutrition security. As global and local demand for soya beans rises, expanding soya production could further improve rural livelihoods and income levels. Notably, the increased income from soya cultivation has enabled some farmers in Ntatumbila to upgrade their living conditions, including constructing houses with iron sheet roofs and diversifying into other crops.

Moreover, small-scale soya bean farmers have several opportunities to advance their production, income, and food security. Access to advanced inputs and technologies, such as microbial inoculants, certified seeds, and field preparation machinery, can lead to enhanced yields and more profitable operations. Soya bean farming also offers job opportunities for women and less literate individuals, who are often marginalized in the agricultural sector. The development of local processing facilities and improved market access can help farmers achieve better prices for their produce, as evidenced by a local entrepreneur who established a soya bean crusher plant for producing and marketing soya cooking oil within the district. Additionally, the rotational use of soya beans with other crops has been observed to improve soil fertility, thereby enhancing maize yields and overall agricultural productivity.

Soya Bean Production and Rural Livelihoods among Small-Scale Farmers

The study sought to compare small-scale farmers' experiences with soya bean production to other crops. Findings indicate that soya bean cultivation has significantly contributed to household food security. Farmers were able to use soya beans to maintain their food supplies and, in some cases, sell surplus to international traders in the area and local businesses. Although soya is cultivated on a relatively small scale, it provides additional income to families' already growing maize, which benefits from government market support through the Food Reserve Agency. Labor availability, particularly in smaller farms, often exceeds the resources needed to expand production. Consequently, smallholder farmers have utilized available labor effectively for their rural livelihood activities.

Farmers reported a rising demand for soya beans due to its diverse applications. The crop is increasingly used in livestock feed, which supplements protein intake in developing countries, and is essential for producing affordable animal feed for pigs, chickens, and fish. Furthermore, soya beans contribute to food security, with many farmers growing them for home consumption to enhance nutritional levels. The production of edible cooking oil also drives the need for soya beans, which requires substantial cultivation to meet market demand. Despite the challenges faced, soya beans generate higher income compared to maize and other crops, presenting a valuable opportunity for farmers to expand cultivation and improve living standards.

The findings in this study revealed that smallholder farmers are often motivated to utilize family labor to optimize their resources, compensating for the lack of alternative productive opportunities and low monitoring costs associated with family labor. This approach enables smallholders to compete in agricultural markets with more capital-intensive commercial farms, despite their disadvantages in terms of capital and information. In response to changing weather patterns, the study found that smallholder farmers are highly vulnerable to climate change effects. In an ideal situation, adopting irrigation technologies used by commercial farmers could enhance their resilience, as noted by Morton (2007), who highlights the shift to irrigated farming as a coping strategy in the face of climate variability in developing countries. Ackim (2015) similarly observed in Mexico but noted that the interaction of market and climate risks might exacerbate household vulnerability during this transition.

Smallholder farmers reported relying on extension officers and fellow farmers for information about improved farming methods. Due to barriers to adaptation, including limited economic and financial resources, inadequate access to usable information, and constraints in credit, technology, and social networks. These factors contribute to lower risk tolerance among smallholders compared to commercial farmers. The absence of commercial farmers in the area has limited the exchange of valuable information. Commercial farmers typically bring resources and access to media such as cable television, radio, and smartphones, which could connect smallholders to market information and opportunities.

Market access is a crucial factor influencing smallholder decisions on crop and livestock choices. Farmers must balance nutritional needs with cash requirements for essential services like healthcare and education. The appropriate cash crop can help smallholders earn necessary income and potentially escape poverty. Commercialization, a key element of

structural food security and agricultural diversification, is essential. In early development stages, smallholders often focused on producing staple foods, with food self-sufficiency prioritized over market-oriented production due to high seed prices and field risks associated with soya bean cultivation.

Challenges Faced by Smallholder Farmers

The study identified several challenges faced by smallholder farmers in Ntatumbila. One significant issue is the government's preferential market support for maize through the Food Reserve Agency (FRA), which limits opportunities for crop diversification. This lack of market assurance for other crops forces farmers to rely on opportunistic traders who often manipulate prices.

Farm size distribution, a crucial factor in agrarian economies, contributes to inequality. Interviews revealed that the average land size cultivated by smallholder farmers was less than 4 hectares. Despite having adequate land, local traditional leaders have exploited the community's vulnerability by allocating unused land to foreign investors, including those from Tanzania and Kenya, to grow crops like maize, sorghum, and soya beans. Scoones (2017) argues that agrarian structures reflect rural political settlements, with different agrarian classes linked to farms of different sizes. The land tenure systems in Africa and Zambia in particular differ across countries and are shaped by various factors including cultural and social difference in land market and government involvement in tenure arrangements. According to the study findings, the land tenure system in the Ntatumbila community creates a level of uncertainty for commercial farmers, who are reluctant to invest on a large scale due to the fear of losing property and assets through political disputes.

Regarding information on agricultural practices from the government, the study highlighted that most smallholder farmers rely on government extension officers and fellow farmers. This has resulted in uneven information distribution, with some farmers not sharing valuable information about good agricultural practices. Efforts to establish market linkages have been hampered by the farmers' poverty and limited access to inputs, leading to low productivity and unreliable supply, which deters large buyers. Poor transport infrastructure exacerbates these issues, as bad road networks make it costly to transport produce, particularly from remote areas with inadequate market connections (Siamabele and Manda 2024).

The lack of communication tools and organization among smallholder farmers often leaves them unaware of potential markets. They typically depend on extension officers for information on marketing and farming practices. Additionally, climate change poses a severe threat, as smallholder farmers rely on rain-fed agriculture and are significantly impacted by droughts, which disrupt food availability and agricultural productivity, as noted by (Ngoma et al., 2021).

Conclusion

This study focused on the potential for soya bean cultivation and rural livelihoods in Ntatumbila village, Nakonde district, Zambia, while also addressing challenges faced by smallholder farmers. A mixed methods research design was utilized in order to effectively collect and analyse the data. The study findings highlighted that Ntatumbila village, was generally a farming community whose livelihood depend on agriculture. While the village

with its favorable land and climate shows promise for soya bean cultivation, the farmers in the community continue to face limitations due to lack of resources. Despite the village's strategic location as a border town with readily available market, the farmers struggle with inadequate support, including seeds, financial loans, and infrastructure (Stadtbäumer et al., 2022). Government policy inconsistencies on price control and market provision further hinder the growth of soya bean farming. The study also established that the community's strengths lie in its available land and labor. However, these are not fully utilized due to insufficient resources and support. Unlike Gwiriri et al. (2021), who emphasized the need for human capital, this study found that the primary issues were technical deficiencies and limited access to capital and commercial networks. Improved agricultural support and consistent policies could leverage the community's strengths for enhanced food security and agricultural development.

Recommendations

The recommendations provided are based on the findings of this research. The study first presented the actual findings before suggesting the following recommendations:

Respondents indicated that support in the form of access to agro-financial loans, market road improvements, proper price controls, and consistent government policies is essential to motivate more farmers to cultivate soybeans. The government should develop a comprehensive support system that includes policy formulation, financial assistance, and training. Additionally, the support provided by government extension officers in farm and crop management should be expanded to include financial literacy and business skills, enabling farmers to approach farming as a business.

Information sharing with farmers is crucial for the development of the agricultural sector in the area. The data collected from interviewed farmers revealed that they had limited access to information, which hindered the expansion of soya beans cultivation. Therefore, more avenues for information sharing are necessary to help farmers access marketing information and other resources essential for farming. The government should ensure that programs aimed at supporting smallholder farmers are not just announced but are also effectively implemented. This can be achieved by providing smallholder farmers with incentives, such as access to markets, affordable loans for farming inputs, and financial support. Furthermore, the implementation of these support programs should be carried out using structures that are objective and transparent.

Mechanisms to ensure accountability in the distribution of support to smallholder farmers should be enhanced by the government to ensure that no smallholder farmer is excluded from the support system.

According to the interviewed farmers, access to agro-loans and other financial support is one of the greatest challenges faced by smallholder farmers in expanding their farming activities. It is essential to empower smallholder farmers with agro-loans for inputs and financial assistance to enable them to expand and effectively plan their soya beans cultivation.

Climate change has negatively affected both smallholder and commercial farmers; however, commercial farmers have been less impacted due to their greater capacity and fallback plans.

There is a need to train smallholder farmers on the effects of climate change and to encourage them to grow climate-resilient crops while adjusting their farming methods in response to changing rainfall patterns. To help smallholder farmers cope with climate change, technological improvements such as irrigation facilities are needed, especially during droughts.

The timely and affordable delivery of inputs is crucial to minimizing the challenges faced by smallholder farmers. Currently, smallholder farmers struggle to access affordable or subsidized soybean seeds, which are often too expensive for individual farmers to purchase.

Enhancements in information dissemination should be prioritized to develop an effective communication system that allows smallholder farmers to make informed decisions about their farming activities. The findings highlighted a gap in information dissemination to smallholder farmers, primarily due to the absence of a system for providing them with necessary information.

Acknowledgements
The authors would like to thank everyone who helped in ensuring that there was a successful completion of this manuscript.

Note on Contributors
All the authors contributed in the completion of this paper. The authors played roles in the development and successful completion of the manuscript.

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