



The Farmer Input Support Program and Poverty Alleviation in Zambia: The Smallholder Farmer's Perspective Using Intervention and Sustainability Theories

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Abstract

Zambia's agricultural sector like many African countries is dominated by smallholder farmers living below the US\$1.9 poverty line. Smallholder farmers are a very critical heterogeneous group in the global agricultural productivity as they supply sufficient food now and in the future. The Farmer Input Support Program (FISP) has continued to target the productivity of smallholder farmers to deal with poverty alleviation without consideration of farmers' resources, incentives, aspirations, and capabilities. Intervention and Sustainability Theories were used to investigate the smallholder farmers' experiences regarding poverty alleviation in the FISP. Qualitative research was adopted with the use of semi-structured interviews for data collection while data analysis was done using NVivo computer software. The research revealed that, to tackle levitating poverty levels a move from the current seed and fertilizer subsidy—FISP, to a more inclusive policy that would include other forms of farming is critical.

Subject Areas

Development Economics, Operations Management, Agribusiness

Keywords

Farmer Input Support Program, Smallholder Farmers, Poverty Alleviation

1. Introduction

In most rural parts of Zambia, the majority of the rural settlers depend on agri-

culture for their livelihoods and as a source of income. Poverty alleviation has been one of the goals of the current Farmer Input Support Program (FISP) through the provision of grain (largely maize) and fertilizer subsidies to smallholder farmers. This scenario has seen most smallholder farmers being inclined to crop farming as opposed to livestock or aquaculture farming. Smallholder farming has great potential for poverty alleviation and can lead the country to self-sufficiency in agricultural production due to its vast and abundant natural resources [1]. The poverty situation in Zambia has been eminent in the lives of smallholder farmers living in a hazardous environment with no access to basic services, good health, education and nutrition, coupled with low income and consumption levels. Further, anyone living below the adopted measurement line of US\$1.90 per day per person is an indication of extreme poverty [2]. Poverty has been described as weakness in major areas of human well-being. This includes malnutrition, analphabetism, low life expectancy, poor health, reduced participation in socio-economic life and inhospitable habitant [3]. Poverty is usually measured by monetary indicators or livelihood indicators. In 2015 according to [4], there were approximately 735 million people living in extreme poverty. Of this number, most of the people resided in rural areas of Sub-Saharan Africa and South Asia. This situation had gotten worse with the threats posed by COVID-19 where the vulnerable people in these regions experienced hunger and poverty. COVID-19 affected the efforts that were being made in reducing poverty around the world [5]. The study done by [6] revealed that no poverty reduction model is ideal hence the need for self-motivated models in a rapidly changing context. The social factors in communities and households are critical for effective and sustainable poverty alleviation among the rural poor. The call has been to champion inclusive, resilient and well-functioning agricultural supply chains in alleviating poverty among the vulnerable and poor farmers through creation of new jobs and better incomes [7].

Zambia has not been alone in adopting subsidies as a poverty reduction initiative as evidenced by data from other Sub-Saharan countries. The subsidies have been around since the 1990s and in 2002, the subsidies changed its name to Fertilizer Support Program which later changed to FISP in 2008. The Government has invested in improving incomes through supporting the more than 80 percent of the farming communities with subsidies in order to reduce poverty levels. The agricultural sector has seen increases in the budgetary allocations for FISP however, high poverty levels in rural areas have persistently not been reduced by the program. The FISP budgetary allocation has been increasing steadily over the years compared to other core functions of the Ministry of Agriculture. In 2004 and 2011 the Government devoted 40% of the agricultural sector budget to fertilizer and maize seed subsidies each year. This resulted in a decline in the provision of research and extension service delivery in the Ministry. This later affected other types of farming as significance was given to fertilizer and maize subsidies [8]. Therefore, the argument is that policies like FISP cannot create the desired transformational change to fully deal with poverty reduction.

The technical change alone cannot resolve the social and economic aspects to champion the change in the smallholder farmers as the risks involved are too high.

FISP as a poverty alleviation program has been performing badly despite significant investments partly because the focus has been on governance as opposed to the smallholder farmers. Therefore, the identification of context-specific factors is critical in poverty alleviation programs [9]. There are more sustainable public investments besides FISP that can help alleviate poverty. These include veterinary support, disease control, crop science, agronomic improvements, and enhanced livestock breed stock, and farmer extension support. Therefore, in tackling poverty alleviation the development of an Agricultural Support Program (ASP) calls for coordinated multi-layered and concerted efforts by all industry participants in agriculture and business environment. The aim is to jointly share the goals in objectivity, transparency, competencies, markets, relevance and other benefits. Partners in the industry should be able to leverage other partners in the delivery of a successful ASP [10]. Fertilizer and seed subsidies have recorded increases in the production of maize and helped in ensuring household food security among the poor in most African countries. However, despite this increase, poverty levels have remained significantly high with many households living below the poverty line [11]. The study by [12] contended that there was need to emphasize whether FISP was meant as a proportion of livelihood security or agricultural growth. If the focus is agricultural growth then targeting should be inclined to farmers with good access to markets and the capacity to grow surplus crops. Consequently, if the objective is livelihood support then the focus should be on poor farmers. Further arguments have been on the need to train smallholder farmers in new and best agricultural technologies to increase their production [8]. The current status which translates to smallholder farmers farming themselves out of poverty while providing food for all has encountered many challenges making agriculture a high-risk livelihood strategy. Reference [13] categorized the livelihood strategies among farmers in two. In the first category are smallholder farmers with limited incentives and resources. The second category is those with the potential and incentives to invest in increased production. The smallholder farmers with limited resources and incentives need help with food security and resilience interventions. On the other hand, those with potential and incentives need help on how to maximize economic growth. The discussed strategies indicate the need to separate food-security and poverty reduction challenges. On the face of it, policies like FISP targeting to deal with poverty reduction and food security seem good by targeting the productivity of smallholder farmers. However, such a scenario is not true for Zambia and many Sub-Saharan countries. Factors that hamper such developments include but are not limited to small hectareage of farmland and rain fed farming as opposed to irrigation. This eventually results in smallholder farmers being risk-averse, even to the extent of avoiding technological advancements that would significantly benefit them economically. The one solution fits all mentality must be avoided at

all costs and realities of smallholder needs must be considered on a case-by-case basis for successful agricultural interventions [14].

Trends in sustainable agriculture have highlighted how smallholder farmers are critical in the global agricultural productivity as they supply sufficient food now and in the future. In Sub-Saharan Africa (SSA) initiatives to increase food production and raise incomes to alleviate poverty have been on top of the agenda. However, the interventions in policies like FISP to reduce poverty have several limitations. Smallholder farmers seldom have the time, money or desire to implement new technologies in their farming to deal with poverty reduction and food security. This fight calls for more integrated programs in the entire agriculture value chain to succeed. There is need, therefore, to develop an agricultural policy that recognizes the limitations and aspirations of the smallholder farmers and their structures. It ought to come with great incentives for smallholder farmers to invest time to learn and adjust their normal lifestyle to embrace change. Additionally, smallholder farmers operate in very risky environments likely to expose them to poor investment decisions characterized by uncertainty. When it comes to decision-making human beings are naturally inclined to choose what benefits them from the many alternatives that present themselves. Smallholder farmers are prone to such natural tendencies of deciding on whether to concentrate their resources on crop farming or livestock farming and vice versa [14].

The need for inclusive transformation to increase access to markets and other supports to trigger sustainable productivity growth for smallholder farmers is cardinal. Agricultural transformations must be anchored on climate change management, investment in infrastructure and market linkages, technology, extension services and a move from rain-fed agriculture. Some of the ways in which Governments could promote inclusiveness of smallholder farmers could be by promotion of agribusiness models and enhancing the farmers' capacity and other food chain actors in managing and coping with challenges in the supply chain. Improvements in production of both agriculture and non-agricultural sectors have over the years reduced poverty. Therefore, policies like FISP cannot succeed by targeting to deal with one issue and neglecting the others [7]. This then highlights the relationship that exists, among sustainable agriculture, food security, climate change, use of technology and poverty alleviation in smallholder farmers. The research therefore, explored the lived experiences of smallholder farmers in Shibuyunji district regarding poverty alleviation and the FISP through the development of a sustainable Agricultural Support Program that can reduce poverty levels in Zambia.

1.1. Background

Most Zambian smallholder farmers practice both crop and livestock farming. Therefore, the FISP has somehow limited the potential that can be realized in the livestock, aquaculture and other types of farming to generate the required incomes and move smallholder farmers out of poverty. The future growth of Zam-

Zambia's livestock and other types of farming among smallholder farmers lies in having an all-inclusive support program than the FISP which provides seed and fertilizer only [1]. In the COVID-19 era and beyond indications are that entrepreneurial behavior must be enhanced and improved among smallholder farmers by training, information sharing and promotion of farmer approaches in decision-making to facilitate farmer investment. Innovation characterized by systematic and strategic approach to decision-making process, competitive aggressiveness besides an autonomous sense of marketing, learning and entrepreneurial orientation is key [15]. Considering such a scenario, government's interventions in the FISP goals for poverty reduction and food security will remain ideas if smallholders are not empowered with proper tools, technologies, services, value chains and infrastructure. There is need therefore, to develop agricultural policies that would be of benefit to smallholder farmers in their production, regardless of the type of farming they are engaged in.

FISP has been at the core of Zambia's agriculture sector development strategy. The main focus of FISP has been on improving food security and incomes through increased production and creation of an environment for the private sector input supply chains to develop. The number of targeted/intended beneficiaries has significantly increased from 120,000 in 2002/2003 to about 900,000 in 2012/2013 to 1,024,434 in 2022/2023 agricultural season [16]. The huge numbers are an indication that there are a lot of smallholder farmers who are in need of support. Therefore, it would be beneficial to target households who do not qualify for FISP under the 0.5 to 2 hectares cultivated criterion to be given a livestock/fish farming criteria. Despite this focus, poverty levels have remained high as a result of certain factors that have not been addressed in the FISP implementation. FISP implementation challenges include poor fertilizer use efficiency among beneficiaries, failure to target poor farmers, poor evaluation and monitoring strategy of the program to ascertain its efficiency in meeting the goals and late delivery of farming inputs to the farmers affecting farmer productivity. Additionally, other factors relate to leakages and input diversion resold on the commercial market resulting in farmers not applying the correct amounts of fertilizer to the crop. Lastly, lack of a weaning-off strategy to eliminate some beneficiaries thereby having the same people benefiting for more than the stipulated period. There is need therefore, for the Government to review the FISP to increase incomes and arrest the ever-levitating poverty levels [17].

1.2. The Problem

The poverty levels among smallholder farmers have been levitating as the FISP in Zambia has concentrated on the seed and fertilizer input support without supporting other types of farming especially livestock, aquaculture and eventually the entire agriculture value chain. This has led to dwindling livestock, aquaculture and other types of farming at the expense of maize production. This has continued to negatively impact rural poverty levels. Therefore, to alleviate poverty there is need to reconsider the current seed and fertilizer-oriented sup-

port to a more inclusive agricultural support program that would include livestock production, aquaculture, agriculture value chain, etc. The paper synthesizes theoretical and empirical literature review and presents the lived experiences of the smallholder farmers in Shibuyunji district regarding poverty alleviation and the current FISP and explores sustainable strategies that smallholder farmers can employ to reduce poverty within their communities [1].

1.3. Gaps in the Literature

The literature on farmer input support in SSA and Zambia, in particular, has extensively focused on the program's implementation with regard to its goals, objectives, budget allocations, effects, targeting, e-voucher system, challenges, food security, fertilizer usage, and maize productivity. However, it has neglected to examine the farmers' personal experiences and expectations of the program, as highlighted in **Table 1**. The existing literature is heavily biased on what the Government needs to do and not on what the smallholder farmers desire to do. This created a situation where farmers are expectant from Government and the Government is expectant to see results from the farmers. The result has been levitating poverty levels among the smallholder farmers despite FISP interventions. In line with the identified gaps in the literature, the research explored the smallholder farmers' experiences of FISP and poverty alleviation in their communities. The study discussed the farmers' perspective within their social setting as opposed to the perspective of policy makers. The participatory and inclusiveness of other types of agricultural support in the FISP has been lacking. Therefore, this research has highlighted the transformations that need to take place in the entire agricultural supply chain for policies like FISP to alleviate poverty considering that the majority of the poor population are smallholder farmers.

2. Methodological Approach

The choice of the methodology was anchored on the discussion by [18], that every good study has to be appropriate to the research question and has to be conceptually and theoretically grounded. The research adopted the Ontology paradigm as discussed by [19] using a constructivist approach. The paradigm was premised on the assumption that people interpret the world around them in different ways based on their perceptions [19] [20]. Therefore, the use of Ontology constructivism enabled the researcher to gather information and theories that emerged from data without preconceived notions but based on the experiences of smallholder farmers regarding FISP and poverty alleviation [19] [21] [22]. The methodology of the study was as detailed in the flow chart in **Figure 1**.

2.1. Research Approach and Design

The research undertook a review of literature to get more understanding of the topic from secondary sources. Then, the collection of primary data through semi-structured interviews was conducted with smallholder farmers. The combination of data collection mitigated the risks that might arise from using a

Table 1. Past research on FISP and poverty alleviation in the agricultural sector.

Authors/Year published	Contextual	Findings	Research Gaps
Sigh P. K., & Chudasama H (2019)	India	Comprehensive poverty alleviation drive calls for the complementarity of various approaches.	The study did not discuss policy interventions like FISP.
Kuntashula, E. (2021)	Zambia	FISP increases maize production and ensures household food security.	The study did not answer the question whether smallholder farmers were happy with maize production to alleviate their poverty.
Kodamaya, S. (2011).	Zambia	Re-focus the targeting of FISP beneficiaries to improve its performance.	The study did discuss the challenges and not the lived experiences of farmers regarding FISP.
Dorward, A., Anderson, S., Bernal, Y. N., Vera, E. S., Rushton, J., Pattison, J., & Paz, R. (2009).	SSA, Zambia	Food security strategies and poverty alleviation strategies must be separated in agricultural policies.	The study did not highlight the lived experiences of farmers regarding FISP.
Molina-Flores, B., Manzano-Baena, P., & Coulibaly, M. D. (2020).	West Africa	Livestock is important in food security, poverty alleviation and wealth creation.	The study did not highlight the capabilities of farmers regarding other types of farming.
Mason, N. M., Kuteya, A., Ngoma, H., Tossou, D. A., & Baylis, K. R. (2020).	Zambia	Challenges in the implementation of FISP and lack of political will affected performance of the e-FISP concept.	The study did not highlight the lived experiences of farmers regarding FISP.
Smale, M., & Birol, E. (2013).	Zambia	Evidence of reduced poverty levels in farmers who received input support.	The study did not highlight the lived experiences of farmers regarding FISP.
Uddin, M. T., & Dhar, A. R. (2018).	Bangladesh	Input support program on Aus rice production improved food security and overall livelihood of the farmers.	The study discussed the support of a staple food and not other types of farming.
Hansen, J., Hellin, J., Rosenstock, T., Fisher, E., Cairns, J., Stirling, C., & Campbell, B. (2019).	SSA, South Asia	Climate risk management interventions can reduce poverty.	The study did not highlight other sustainable interventions as seen from the farmers' perspective.
Vos. R., & Cattaneo A. (2020)	South Asia, Africa	Inclusive food value chains can reduce poverty.	The study did not highlight how a single policy can tackle poverty alleviation.
Gassner, A., Harris, D., Mausch, K., Terheggen, A., Lopes, C., Finlayson, R. F., & Dobie, P. (2019).	Africa	It is not practical to reduce poverty without recognizing the capability and incentives of farmers' typologies.	The study did not highlight the lived experiences of farmers regarding FISP.
Osabohien, R., Matthew, O., Gershon, O., Ogunbiyi, T., & Nwosu, E. (2019).	West Africa	Poverty reduction through agriculture is dependent on human capital development.	The study did not highlight other sustainable issues based on the lived experiences of farmers.

Source: Researcher compilation of literature reviews (2023).

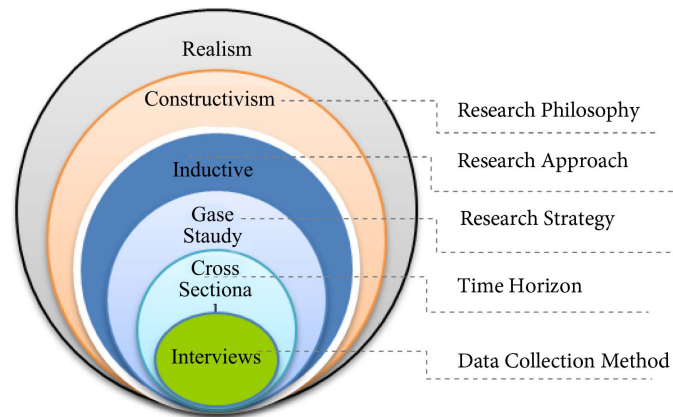


Figure 1. Methodological approach. Source: The authors' compilation, 2023.

single data collection tool and avoided biases. The research was descriptive in nature both from data recording to dissemination of the findings. The research was concerned with the general social process in Shibuyunji as opposed to generalizability in the conventional way. The results were used to promote social change and better understand the human behavior and experience [23].

The study employed qualitative research to benefit from explanations of smallholder farmers' behavioral meaning and explore the perspective and meaning of their experiences while seeking insight and identifying the social process [24]. The study embraced the process theory which tends to see the world in terms of people, situations, events and connecting processes. This then, enabled the generation of new ideas around FISP and poverty reduction. Further, the study helped in improving existing practices, programs, policies, etc. The research adopted an engaging, participatory, and collaborative approach with the participants as highlighted by [25].

The research employed purposive sampling targeting smallholder farmers with shared characteristics of being beneficiaries of the FISP in the 2022/2023 farming season. The use of computer software called NVivo was used as opposed to manual coding and categorizing. The data analysis took care of and eliminated any potential threats by validating the data ensuring that any desire to impress the researcher by the participants was minimized. Further, to ensure the validity of the data, the researcher was vigilant in looking out for behavior where participants felt obliged to provide the information religiously for fear of being removed from FISP. The researcher ensured neutrality in the collection and interpretation of the data. The use of follow-up questions to clarify participant's views on the subject was adopted [26] [27].

2.2. Study Site and Population

The research was conducted in Shibuyunji district in Central Province of Zambia. Shibuyunji is about 70 km west of Lusaka Province with approximately 5252 km² of land. The population of Shibuyunji is about 127,604 of which 83.10% represents the rural population compared to the urban population of 16.90%

[28]. The people of Shibuyunji like many districts in Central Province depend on agriculture as their main source of income. The selection of Shibuyunji was based on the premise that smallholder farmers were highly exposed to crop and livestock production. Additionally, this area receives an average rainfall of between 800 - 1000 mm making it suitable for any type of farming. The region has potential market for its produce being in close proximity to the capital city with little agricultural activities as detailed in **Figure 2** [28].

2.3. Ethical Considerations, Informed Consent and Trustworthiness

Ethical issues concerning informed consent, confidentiality, privacy, deception, and harm to participants were minimized, especially, since the interviews were conducted face-to-face [29]. The researcher ensured that extra care was taken to explain in detail to participants, the purpose of the study and any potential risks and benefits of participating in the study using a language participants were more familiar with [30]. The participants only proceeded to sign the consent forms once all doubts, concerns and questions were clarified and answered. To address the issue of credibility data was collected with the help of the agricultural extension officers working in particular agricultural camps since they were familiar with the environment. To achieve transferability the researcher described the context where the study was conducted in the section highlighted as the research area and study population. To achieve dependability, the research was approved by the UNZABREC and reviewed by peers who read through and gave feedback. Confirmability was addressed by the researcher maintaining objectivity, reflexivity and refraining from imposing one's own experiences, beliefs, and biases on the findings of the study [19].

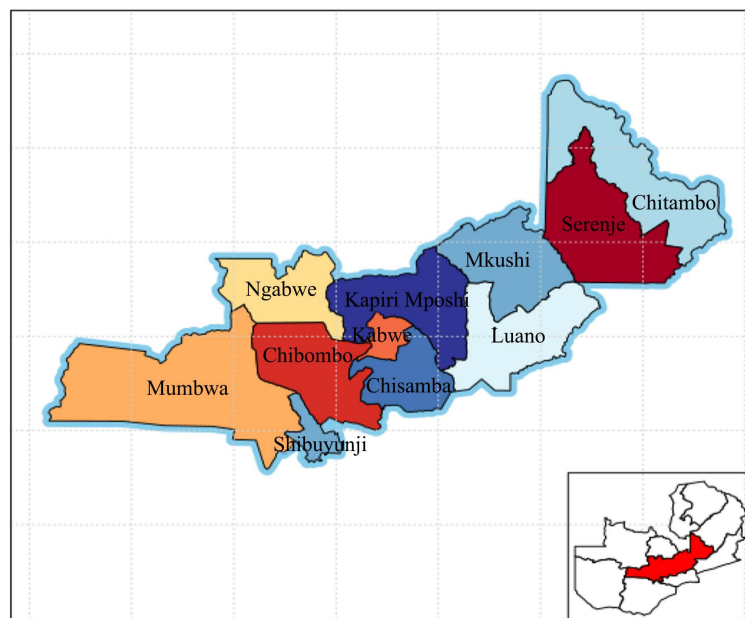


Figure 2. Location of study area. Source: Zambia statistics agency, (2020).

3. Theoretical and Conceptual Frameworks

The sustainability and intervention theories aided the discussion with poverty alleviation strategies that smallholder farmers could employ besides the FISP. Theoretical framework emerged from a thorough literature review which included an overview of FISP, its objectives, importance, selection criteria, and outcomes [29]. Identification of the different categories of smallholder farmers is key in order to correctly apply the solutions specific to their situations. Governments and the private sector can then apply interventions that would benefit the smallholder farmers based on case-by-case. Whatever actions or interventions are employed there is need to assess their impact in the future to see how sustainable they are. The smallholder farmers are therefore key in alleviating poverty and the success of any intervention depends on their willingness to adopt new ways of doing things in the most comfortable way. The conceptual framework highlighted how poverty alleviation is interlinked with food security, climate change, income generation, and sustainable agricultural practices as detailed in **Figure 3**.

The intervention theories were discussed based on literature, and using the inductive approach based on the fieldwork and the user's observed actions and experience. The FISP in Zambia was discussed in terms of challenges, benefits and way forward to smallholder farmers, in the light of sustainable and competitive strategies. Intervention theories helped in describing the intentions of the policy in terms of its functions and implementation as highlighted in **Figure 4** [31] [32].

The research was conducted in a community and therefore, sustainability theory relating to environmental, economic, and social, performance, and governance perspectives were discussed as informed by the literature review. From the environmental perspective, discussions were around improved farming technological and market strategies. The social perspective discussed issues of social independence, self-motivation and active engagement while the economic perspective discussed issues of increased domestic revenue, poverty reduction and income generation. The performance perspective discussed issues of increased information sharing, technology improvements and formative feedback and finally, the governance perspective discussed issues of best practice, policy changes and improvements.

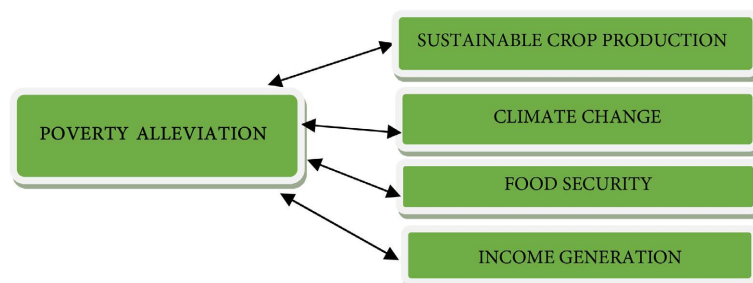


Figure 3. Conceptual framework. Source: The author's compilation, 2023.

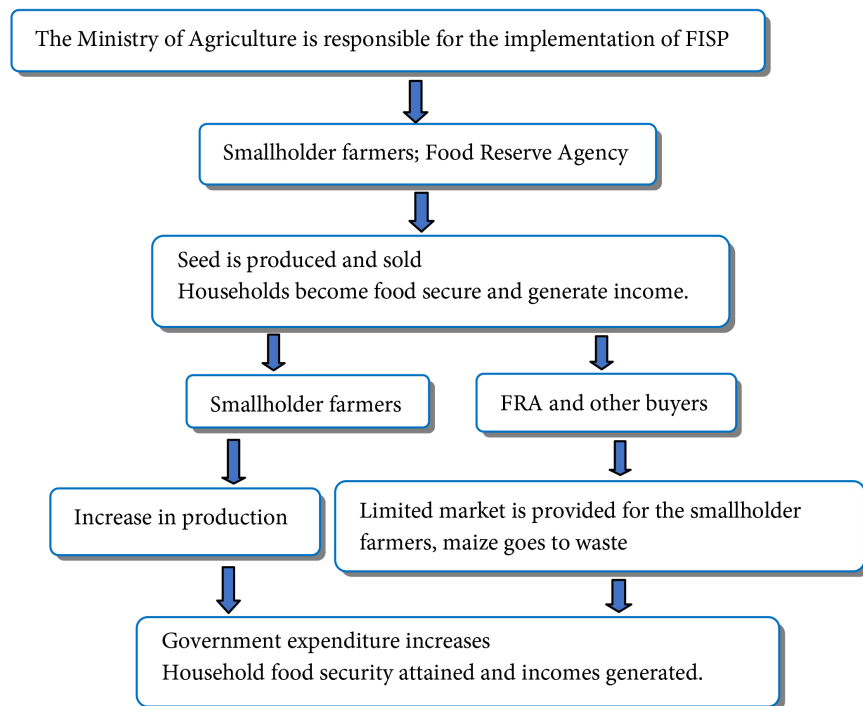


Figure 4. Intervention theory. Source: The author's compilation, 2023.

4. Findings and Discussions

4.1. Findings

To assess the severity of poverty levels on the smallholder farmers it was important to explore their lived experiences before the introduction of FISP. The flowchart in **Figure 5** details how the findings were obtained from the smallholder farmers in Shibuyunji.

In reference to **Figure 5** the smallholder farmers described their living conditions before FISP as unbearable as it was extremely difficult to afford the cost of farming inputs. The smallholder farmers described their farming activity as very risky as they were not able to generate enough income. Further, climate change was impacting negatively on their farming activities especially that it was rain-fed. The smallholder farmers indicated that in as much as FISP helped them to be food secure at household level, poverty was still in their homes as their crop production was affected by the challenges they experienced with FISP which included:

1) Late Delivery of farming inputs—The farmers highlighted that the delivery of the farming inputs was late. The situation was exacerbated by the long distances from the designated depots and the farming blocks where the roads were in a bad state of repair. This negatively affected the fertilizer application making the yield response and price condition unprofitable [33].

2) Inadequate farming inputs—The farmers expressed that in the 2022/2023 farming season, the amount of inputs received was very little compared to the other years and this affected their planning and productivity. The inadequacy of

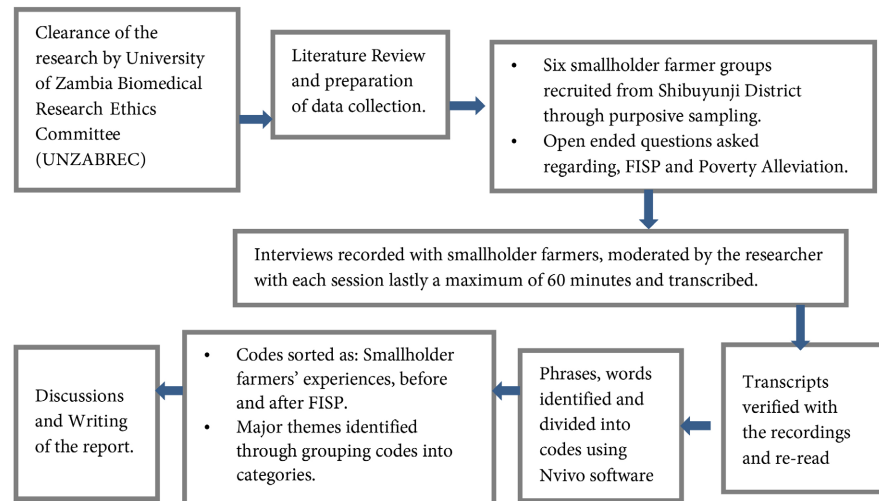


Figure 5. Obtaining the findings. Source: The Authors compilation, 2023.

the inputs made farmers only grow maize for consumption thereby affecting their income. The smallholder farmers felt that the current support structure has limited their potential to produce as farmers.

3) The inefficiency in the management of cooperatives—The farmers indicated that there existed some inefficiencies in the way the cooperatives were being run. Some members of the cooperatives would collect the inputs for resale when other members needed the same for their crops. There was need for proper management of cooperatives in order to benefit the people as opposed to them coming together just to collect the inputs. Some farmers expressed that they were more comfortable to be receiving the inputs as individuals and not as cooperatives.

4) Lack of access to markets—Some farmers lamented that the FRA dictated the floor price for maize without proper calculation of the cost of production. The farmers indicated that the price of maize sold to FRA was not profitable compared to when they sold their maize to neighboring countries. But since other markets are not accessible, they just opt to sell to FRA even if they don't agree with the price as opposed to losing the crop altogether. They proposed to have other buyers who would come with a competitive price for them to reap benefits from their produce.

5) Lack of the preferred choice of seed varieties—The farmers highlighted that despite their contribution to access the subsidy, the FISP implementation team did not give them a choice in the selection of maize seed varieties that would increase their yield. Their experience was that some seed varieties distributed to them were not very good for the type of soils they had in the area and did not take into consideration the changes in climate.

6) Lack of timely Information and Communication—The use of Information and Communications Technologies (ICT) could help in ensuring that communication is effective. Further, the information provided has been generic and does not necessarily suit farmer's specific needs and conditions. Lack of

access to information by smallholder farmers impacts negatively on productivity growth and poverty reduction. The major challenges have been on a limited number of farmers that can be reached [34].

4.2. Discussions

4.2.1. Sustainable Agricultural Practices

In discussing sustainable agricultural practices and how they can help in poverty alleviation, issues of diversified farming systems have to be considered in designing agricultural interventions. Crop diversification can be achieved through farm activities, crop varieties and multiple income streams. To get out of poverty, diversification can be achieved through farm and non-farm income sources. This is consistent with the discussions by [35], who highlighted how crop diversification would stabilize production and income. The findings are in agreement with [36], whose study highlighted how livestock diversification increased household food security in Southern Ethiopia. Livestock production can be used as a systems component in sustainable crop production through manure harvesting to increase soil fertility. The study further discussed how the cultivation of forage must be adopted to improve animal health and reproduction while reducing time spent by women and children scavenging for animal feed. Therefore, there was a need to invest in forage research that would help farmers get the best out of their investment in livestock production. Benefits have been recorded in diversifying agroforestry into crop and/or livestock farming by integrating various tree species into the production system. These trees can include fruit trees, fodder shrubs, fertilizer trees, and native species to achieve improved soil health, diversified production and reduced soil erosion. Considering that smallholder farmers in Shibuyunji had land which was not fully utilized in the growing of maize due to limited fertilizer and seed they received, the idle land can be utilized for integrated farming. This can only be achieved if farmers were given economic incentives to manage common resources sustainably, landholding and general management of the systems within their location and socio-economic factors [36]. This has been supported by [37] who discussed environmental roles that livestock had in diversified conservation farming systems. The animals feeding on plants sustain diverse ecosystems and help in the control of invasive species. The natural resilience of smallholder livestock systems provides climate adaptation strategies while climate mitigation is done through traditional low-input systems in the production of animal products which do not increase greenhouse gas emissions.

The discussions reveal that the lack of a policy that takes into consideration sustainable agricultural practices negatively impacts smallholder farmers. They are prone to lose income and assets and might experience food insecurity, indebtedness and other social-cultural challenges. The call therefore, is to have agricultural support programs which incorporate land and water management, crop management, livestock management, aquaculture management, agroforestry and integrated food energy systems that are environmentally friendly and

sustainable. The promotion of sustainable agricultural practices will then alleviate poverty through improved smallholder farmer livelihoods.

4.2.2. Investment in the Use of Technology

The farmers in the study area were quick to indicate that the cost of technology was too high for them to afford. This is consistent with the findings of [38] that access to credit can stimulate technology adoption. According to [39] agricultural technologies and practices facilitate growth of agricultural output. The key is to increase output while reducing average cost of production and in turn make substantial gains in income. Increased productivity leads to higher earnings, increased food security, increased employment opportunities and reduced poverty levels. The smallholder farmers were willing to take on technology in their farm production provided the uptake economies of size would be profitable. The adoption of technology is dependent on access to reliable, consistent, accurate and beneficial information for farmers to make their own assessments about that technology [40]. The access to technological information is related to the literacy levels of the farmers. Educated farmers, are more receptive to adopt new technologies as they are more open, rational and able to analyze the benefits of new technology [39] [40]. In a rural setup like Shibuyunji it was very protuberant to interact with older farmers. Reference [41] discovered that older farmers become risk averse in adopting new technologies. The use of improved agricultural technologies in smallholder farming is fundamental as it improves agricultural productivity thereby reducing poverty. Further, adoption of technology increases farm production, improves nutrition, enhances operational efficiency, creates employment, and helps adaptation to climate change [42]. Therefore, in order to alleviate poverty, it is cardinal that intervention policies like the FISP understand the heterogeneity of smallholder farmers in line with their perception towards adoption of new technologies. Policies that are developed without understanding the needs of farmers and their ability to adopt technologies that suit them would be planning to fail.

4.2.3. Investment in Basic Infrastructure and Access to Market

The smallholder farmers in Shibuyunji indicated that the non-availability of storage facilities and other infrastructure made them opt to make sales immediately after harvest, resulting in vulnerability on the market. The smallholder farmers usually market what has been produced rather than producing for marketing. This is consistent with the observations by [43] [44] that farmers without enough and good on-farm storage facilities opt to sell their produce at the earliest opportunity. Reference [43] observed that roads in the peri-urban areas have been maintained at the cost of rural roads that are in the value chain of feeding the nation and alleviating poverty. It must be noted that economies of rural areas are just as important as those in urban areas in lifting people out of poverty. Good physical and institutional infrastructure are critical in agriculture as they lead to diversification of livelihoods in rural areas and contributes to poverty

reduction substantially [45]. Therefore, in order to address the issues around provision of infrastructure, Government needs to prioritize investment strategies and projects based on cost-benefit analysis by ranking alternatives. The success of FISP demands for infrastructure investment and development through the establishment of an infrastructure fund. This can be achieved through capital markets, foreign and domestic sources of capital, PPPs, small-scale community-based infrastructure, etc. In this process, it is important to ensure that the poor and the other key stakeholders are not disfranchised.

4.2.4. Crop Failure Due to Climate Change

Farmers in Shibuyunji district were experiencing crop failure despite the subsidized input due to over-dependency on rain-fed agriculture as their only source of livelihood. The observation by the smallholder farmers is consistent with the study done by [12] [46], highlighting the risks related to climate change impacts, which included crop failure, disease and pest infestation, drought and floods. It should be noted however, that rain-fed agriculture still maintains an important role in the growth of food production and poverty alleviation both now and in the future. The importance of rain-fed agriculture in the face of climate change is dependent on appropriate investment and policy reforms to enhance its contribution to reducing poverty. To avert these risks the smallholder farmers need to be empowered with the right and timely climate information to strengthen decision-making and embrace sustainable strategies that will ensure productivity. This could be through the use of early maturing drought tolerant and water efficient crops and crop varieties, and adopting soil and water management technologies. Therefore, agricultural policies like FISP could incorporate irrigation schemes to not only improve food security but also reduce poverty. The call is on Government to prioritize investment in irrigation farming, especially at smallholder farming level. The desirous action therefore, would be to improve smallholder farmers' welfare to levels where they generate income from both farm and non-farm activities to see them move out of poverty.

4.2.5. Extension Services

The resultant of inadequate extension services in the study area has been wasted crops at the expense of subsidized inputs. When farmers perceive the inadequacy of extension services they become reluctant to seek the services [47]. The smallholder farmers preferred the participatory approach in a more decentralized system than the top-level decision, where issues could be resolved with their involvement. Access to extension services can help in assessing the usefulness and use of recommended knowledge and technology by farmers which would increase production and ultimately increase income and reduce poverty levels. More can be achieved if extension services can be well planned and coordinated routinely as opposed to visiting farmers on request [47]. Extension services serve as a means by which challenges experienced by farmers could be identified for research and policy formulation for the benefit of rural communities. To fully

benefit from extension services smallholder farmers need to attain a certain level of education to ease communication with the extension officers [48]. It is cardinal to place the smallholder farmers at the center of policy formulation to achieve the desired goals/outcomes. Extension services must provide knowledge and skills; technical advice and information; motivation and farmer organization through the process of learning, dialogue and adoption of what has been learned. The uptake of extension services depends largely on the accuracy and relevancy of advice being shared; timeline in terms of duration and availability; meeting the needs and requirements of smallholder farmers; appropriateness for smallholder farmers; efficiency of results obtained against resources invested and achievement of the objectives. Therefore, to improve smallholder farming practices and reduce poverty, deliberate efforts must be made to increase their awareness of the extension services to provide interventions and alternative options. Smallholder farmers are likely to participate if they feel they are a part of the extension services from the very beginning and throughout the whole process [49].

5. Conclusion and Recommendations

Greater focus has been placed on the development of smallholder agriculture in Zambia. This has been necessitated by the fact that 80% of agriculture is mostly practiced by smallholder farmers. The Gross Domestic Product (GDP) attributed to agriculture has been about four times more effective in reducing poverty than the GDP of other sectors the world over [50].

The research has revealed that poverty levels in the study area were worse before the introduction of FISP. While the picture regarding poverty levels changed with the introduction of FISP the situation still requires attention to alleviate smallholder farmers from poverty. It calls for improvements in the management of FISP and improvement in the entire agriculture sector for meaningful strides to be recorded in poverty alleviation. The smallholder farmers are looking forward to an agricultural support program that would be all-inclusive as opposed to the current fertilizer and seed subsidy. The access to markets, improvements in infrastructure, climate change mitigation (introduction of irrigated farming to move away from the over-dependency on seasonal production), and use of technology were among the issues that were highlighted by the smallholder farmers through their lived experiences. Therefore, a successful agricultural support program must consider investment in infrastructure and market linkages, development of inclusive value chains, adoption of agricultural technology, investment in climate-smart agriculture, and extension services. The farmers were ready to diversify from crop farming to other types of farming which included livestock and fish farming provided they received the necessary information, skills and training. Despite the farmers' challenges in alleviating poverty in the FISP, they demonstrated some level of sustainability in dealing with these challenges affecting their farming. Smallholder farmers showed wil-

lingness to adopt technologies and programs that would increase their productivity and improve their livelihoods. This was exhibited in their strength and determination to acquire skills and technologies that would help to solve their problems by emphasizing their abilities and resources for a better future. Above all the success of a policy is dependent on understanding community needs in supporting social infrastructure and building capacity in poor and vulnerable communities.

Recommendations

In view of the findings and discussions regarding the FISP, poverty alleviation and the lived experiences of the smallholder farmers in Shibuyunji district, the following recommendations would be key:

- Incorporate competent, quality and dedicated support structures at national, provincial, district and ward levels. The purpose of these structures is to build and sustain strong and viable institutions at all levels to help the poor in smaller groups. The success of the program is dependent on community management.
- Provision of the much-needed infrastructure is key in ensuring that value chains, market linkages, supply chains and other forms of linkages are sustainable.
- Investing in climate-smart, eco-friendly and innovative agriculture production systems has been critical in attaining sustainability in programs of poverty alleviation. Synergies among the farm and non-farm players in the sector while developing specific value chains should be encouraged.
- Access to micro-finance at affordable rates would be convenient in the reduction of rural poverty among smallholder farmers. The adoption of Public Private Partnerships (PPPs) would be sustainable in improving the livelihoods of the poor.
- Robust implementation of institutional accountability, self-monitoring processes which include external social auditing, community scorecards, internal reviews, and tracking of public expenditure. The use of ICT would be critical in monitoring and evaluating the system to facilitate speedy informed decision-making.

Conflicts of Interest

The authors have no conflict of interest to declare.

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