

Non-Use Of External Inputs And Food Security Of Small Holder Farmers: A Case Of Kiruhura District.

Uganda

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Abstract

The study investigated the effect of non-use of external on food security of small holder farmers: A case of Kiruhura District, Uganda. The key objective that guided the study was to assess the effect of moderate use of external inputs on food security of small holder farmers in Kiruhura District. A cross-sectional design using mixed methods approach was used to answer the study questions. The sample size for the study was 327 with 310 respondents participating in the study hence giving the average response rate of 91.4%. Stratified random sampling and purposive techniques were used to select the participants. Data analysis involved frequencies, means and inferential statistics such as correlations and the coefficient of determination. Findings revealed that smallholder farmers heavily rely on rainfall for water and employ rudimentary tools, animal manure, and plant leaves for farming. Weather uncertainties limit year-round cultivation, impacting agricultural quality and contributing to food insecurity. The study suggests that non-use of external inputs hampers food security, recommending a government-led campaign, through the Ministry of Agriculture, Animal Industry, and Fisheries in Uganda, to raise awareness about modern farming methods.

Key Words: External Inputs, Food Security And Rudimentary Tools.

Introduction

Recent estimates by the World Food Program (2021) indicate that 26.4% of the world's population lived in a food-insecure state in 2020. Additionally, global statistics show that approximately 821 million people worldwide were undernourished in 2021, a tenfold increase from the 81.97 million undernourished in 2010 (Allan et al., 2023). Despite Uganda's abundant natural resources and sufficient rainfall, food insecurity remains a significant development challenge. According to the Food and Agriculture Organization, 12% of the population experienced chronic food insecurity in 2021. In Kiruhura District, 33% of households face food insecurity due to limited availability, lack of availability and instability, according to the NAADS District Coordinator. The

main causes are poor agricultural practices and low, declining yields (Collins et al., 2023).

Unchecked food insecurity not only poses a threat to malnutrition, especially among children, but also threatens Uganda's progress towards Sustainable Development Goal 1c, which is to halve chronic hunger and extreme poverty (Christopher & Micheal, 2022). This goal is outlined in the National Development Plan (NDP II) and UBOS (2020). While existing studies examine the impact of technology and commercialization on nutritional security, there is limited documentation on how agricultural practices affect food security among smallholder farmers in Kiruhura District. This study aims to fill this gap by examining the relationship between agricultural

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practices and food security of smallholder farmers in Kiruhura District, Uganda.

Problem Statement

Kiruhura district in western Uganda is predominately rural with the majority of the population engaging in smallholder subsistence farming. However, food security remains a challenge for many farmer households in the district. Smallholder farmers typically farm small plots of land using mainly basic hand tools and rely mostly on traditional seeds, manure and minimal or no use of external agricultural inputs such as improved seeds, fertilizers and pesticides. The non-use of external agricultural inputs has been identified as a key factor undermining soil fertility and agricultural productivity among smallholder farmers in Kiruhura district. Without the replenishment of soil nutrients through external inputs, the soils have become depleted over the years leading to declining yields. As a result, agricultural productivity and household food production among smallholder farmers remains low, making many households food insecure for extended periods. Further complicating the issue is the rising population growth rates which are exerting more pressure on the limited arable land. Yet availability and access to agricultural inputs such as fertilizers, seeds and technologies remain a challenge due to factors such as high costs, inadequate supply, lack of awareness and knowledge among farmers. The limited extension services also negatively impact information dissemination to farmers about improved farming methods and the importance and proper use of external inputs.

The problem is that the continued non-use of external agricultural inputs among smallholder farmers in Kiruhura district is undermining soil fertility, reducing agricultural productivity and household food production, thereby perpetuating high levels of food insecurity among farming households.

Main Objective

To investigate the effect of non-use of external on food security of small holder farmers

Literature review

The study was guided by the theory of induced innovation developed by Hayami and Ruttan in 1970. This theory posits that relationships between factors and product prices lead to the adoption of various technological innovations that ultimately maximize agricultural productivity and ensure food security (Paul & Kazaara, 2023).

According to (Turyatamba et al., 2022), the theory of induced innovation asserts that relationships between factors and product prices lead to the adoption of various technological innovations to maximize agricultural productivity and thereby ensure food security. This theory is based on the assumption that achieving long-term and sustainable food security for agricultural households requires linking production with sustainable agricultural practices, including the adoption of improved seeds and moderate to high use of external inputs in agriculture (Collins et al., 2023).

The study chose to adopt the induced innovation theory because of its ability to clarify the link between agricultural practices and food security. This theory not only delineates the relationship but also offers practical solutions to guide smallholder farmers to action to address the food security issue.

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An empirical review.

In Uganda, agriculture is largely dominated by smallholder farmers who occupy much of the land and produce most of the plant and animal products. They constitute 85% of the total population in agriculture (Nabuumu et al., 2021). As one of the challenges to food security in Uganda is the high cost and limited access to improved agricultural inputs and production technology as reported by (Grace et al., 2023), timely and convenient availability of these inputs is a critical factor in food improvement. security among households in the country. Similarly, Bakhtsiyarava and Grace (2018) also observed that agricultural inputs in the form of improved seeds, fertilizers, machinery and irrigation are viable and effective strategies to avoid household food insecurity. However, in Uganda, the use of quality inputs such as seeds, fertilizers and pesticides is low due to their limited availability and accessibility. Additionally, the mindset of farmers that Ugandan soils are naturally fertile has also slowed the use of production inputs to increase production and productivity (NPA, 2018).

Methodology

A descriptive cross-sectional design was adopted. As guided by Creswell (2014), this research study design involved collection of data from different households at a single point in time. This design was preferred because it helps the researcher take a snapshot of a sample population at a single point in time, allowing conclusions to be drawn about phenomena across a wide population.

A mix of qualitative and quantitative approaches enabled one approach to compliment the other in the study. To quantify the number of respondents, a quantitative approach was used while qualitative will be used to explore in-depth how rewards affect employee performance.

The sample size of the study was selected using the Krejcie & Morgan's (1970) table, as cited by Amin (2005) for sample section. A total of 339 respondents were picked across all sub groups and both purposive and simple random sampling methods were to select respondents for the study.

The researcher used both probability and non-probability sampling techniques including simple random sampling technique. The study utilized stratified sampling technique to select small holder farmers. The technique was used because it minimizes selection bias by providing an equal and independent chance to all elements from that population category of being selected into the sample population (Berndt, 2020). Conclusively, the technique helped the researcher to obtain a proportional representation of smallholder farmers from each of the main farming activities in Kiruhura district. Additionally, purposive sampling was used to select NAADS Coordinators and top leadership of farmers groups. This technique enabled the researcher to identify and select respondents who have knowledge and experience on the subject matter and provided the best information that was needed for the achievement of the objectives study (Taherdoost, 2016).

The researcher carried out both quantitative and qualitative data analysis. Sheard, (2018) defines quantitative data analysis as the process of presenting and interpreting numerical data using statistical or mathematical models (Sheard,

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2018). Descriptive statistics were used to analyze quantitative data using frequencies, percentages, mean and SD from all of the study variables using SPSS & STATA (Nelson et al., 2022). ‘Strongly agree’ and ‘agree’ responses was merged to mean ‘agree’ while ‘strongly disagree’ and ‘disagree’ were merged to mean ‘disagree’ when analysing descriptive data. In order to test for hypothesis and to answer the research objectives, the researcher used inferential statistics to investigate the effect of farming practices on food security of smallholder farmers. Correlation coefficient was used to indicate the degree to which variables are related to one another. This enabled the researcher to find out the direction whether positivity or negativity. Regression analysis was carried out to establish the linear relationship between farming practices and food security of small holder farmers. Qualitative data that was collected using interviews and scrutinized using content analysis where information was arranged in major theme of moderate use of external inputs. These were then be presented using the narratives as presented by respondents. Implications, conclusions, and inferences of qualitative information on moderate use of external inputs was drawn. Efforts were made to cross-examine qualitative data with the quantitative findings to find agreement and disagreement (Amin, 2005).

Results

Table 1: None use of external inputs

Statements measuring none use of external inputs	Disagreement		Not sure		Agreement	
	Freq	%	Freq	%	Freq	%
Smallholder farmers in Kiruhura District cultivate crops throughout the year.	297	99.0	0	0.0	3	1.0
Smallholder farmers in Kiruhura District have alternative source of water for their crops and animals.	300	100.0	0	0.0	0	0.0
Smallholder farmers in Kiruhura District entirely depend on rainfall as their major source of water for their crops and animal	33	11.0	0	0.0	267	89.0
Smallholder farmers in Kiruhura District use indigenous handmade tools to carry out agriculture	66	22.0	0	0.0	234	78.0
Smallholder farmers in Kiruhura District use animal manure and plant leaves as their major source of fertilizer	21	7.0	0	0.0	279	93.0

Source: Primary data (2023)

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Table 1 shows that the majority of respondents, 99.0%, were in disagreement with the statement that smallholder farmers in Kiruhura District cultivate crops throughout the year. This implies that still relies on whether to cultivate crops

In respect to whether smallholder farmers in Kiruhura District have alternative source of water for their crops and animals, all the participants, 100%, were in disagreement. This means that Smallholder farmers have no alternative source of water for their crops and animals.

On whether smallholder farmers in Kiruhura District entirely depend on rainfall as their major source of water for their crops and animal, the majority, 89.0%, were in agreement to the statement. This means that the farmers entirely depend on rainfall.

Furthermore, on whether smallholder farmers in Kiruhura District use indigenous handmade tools to carry out agriculture, majority of the respondents, 78%, were in agreement with the statement. This implies that farmers use indigenous handmade tools to carry out agriculture (Niyonzima, 2023).

Lastly, when respondents were asked whether Smallholder farmers in Kiruhura District use animal manure and plant leaves as their major source of fertilizer, the majority, 93.0%, were in agreement. Hence indicating that they only use animal manure and plant leaves.

The above descriptive findings were supplemented by findings from a qualitative data. From interviews, a question was posed about smallholder farmers in Kiruhura District using indigenous handmade tools to carry out agriculture. All in all, the views of the key respondents are still rocked in traditional methods of production. These views are represented in one of the voices of the participants who stated that;

‘Farmers in Kiruhura District are still using traditional methods of farming. This justifies why agricultural production has stagnated hence leading to some households to suffer from food insecurity. As a district, we have tried to sensitize them. However, majority are still stuck in analogy as the saying goes now days’ KII4.

This implies that farmers in Kiruhura District are still using traditional methods of agriculture which exposes majority of them to food insecurity.

Regarding smallholder farmers in Kiruhura District entirely depending on rainfall as their major source of water for their crops and animal. One of the key respondents intimated that;

‘Majority of the small holder farmers in Kiruhura District have not yet embraced the use of irrigation. They still depend on rainfall as the major source of water for their crops and animals. This justifies why they are unable to have enough food to supply to markets throughout the year as well as for domestic consumption. When the rainfall is unreliable, agricultural production always go down hence leading to food insecurity’ KII4.

This implies that rainfall is the major source of water for most of the farmers in Kiruhura District

The interpretation from both quantitative and qualitative data indicates that majority of the smallholder farmers in Kiruhura District entirely depend on rainfall as their major source of water for their crops and animal, they still use

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rudimentary tools to carry out agriculture, they still use animal manure and plant leaves as their major source of fertilizer and they are unable to cultivate crops throughout the year because of the weather vagaries. Putting the above into consideration, this affects the quality of the agricultural production and consequently leading to food insecurity.

Discussion of findings

The study findings revealed that there is a statistically significant percentage between non-use of external inputs and food security. This finding is in agreement with NAADS Guidelines (2005), which stipulates that advisory services should focus on increasing agricultural production, incomes, introduce appropriate technologies which are affordable to the farmers, stimulate on-farm employment, facilitate formation and strengthening farmer organizations, developing new market linkages, providing social services and conserving environment. However, on the contrary, non-use of external inputs leads to low food production and where there is low-input, low-output activity with high levels of transaction costs, post-harvest losses and therefore, low-level of external inputs leads to insignificant level of food shortages. This finding agrees with Feder et al., (2004), Extension and use of external inputs can contribute to increasing the speed of technology transfer, increasing farmers' knowledge and assisting them in improving farm management practices and production.

External inputs influence the food security of smallholder farmers which is in close agreement according to Anderson & Feder (2003) that productivity improvements are only possible when there is a gap between actual and potential productivity. They suggested two types of 'gaps' that contribute to the productivity differential, the technology gap and the management gap.

The study findings are in line with previous findings that any government's commitment to developing a viable and efficient farming practice improvement starts with development of human capital from extension advice and services to farmers as noted Nygaard et al., (1997). This is in agreement with many studies in Africa that show positive impacts of external inputs and extension contact (Owen et al, 2001; Ragasa et al., 2012; Hasan et al., 2013).

Evenson (1997) also points out that because of large variation in programme design and field worker, it is not feasible to make broad generalisations about economic contribution of external inputs. This finding is confirmed by Kjaer et al., (2013) in a study in Uganda, that despite several major reforms programmes in agriculture and agribusiness in particular, National Agricultural Advisory Services remain next to non-existent. In Uganda, there are only 1500 extension workers in the entire country and much less with the dissolution of NAADS (MAAIF, 2014).

Agricultural and farming practices in Uganda has evolved over time through transformation into unstable service for several reasons (Semana, 2004). Rivera et al., (2000) argued that the pressures on use of external inputs is calling for changes in traditional farming practices which are now seen as outdated, top down, paternalistic, inflexible, subject to bureaucratic inefficiencies and therefore less able to cope with the dynamic demands of modern-day agribusinesses.

The finding revealed that smallholder farmers in Kiruhura District use animal manure and plant leaves as their major source of fertilizer. This finding according to Betz, (2009), is a result of extension worker often gravitating towards

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more capable and motivated farmers and information spill over between farmers. Farmers received information on new technologies and approaches through a variety of sources including formal extension, mass media, outlet such as radio or newspapers, private companies and other farmers. This makes it difficult to estimate the impact of extension on output. The study findings for objective one also indicated that smallholder farmers in Kiruhura District entirely depend on rainfall as their major source of water for their crops and animal. Therefore, government efforts to ensure that the majority of agricultural farmers are in direct contact with extension agents should be supported so as to improve and transform agricultural households in Uganda. The results from crop productivity estimates show that extension visit variable is positive and significant.

Conclusions

The study therefore concludes that small holder farmers entirely depend on rainfall as their major source of water for their crops and animal, they still use rudimentary tools to carry out agriculture, they use animal manure and plant leaves as their major source of fertilizer and they are unable to cultivate crops throughout the year because of the weather vagaries. Putting the above into consideration, this affects the quality of the agricultural production and consequently leading to food insecurity.

Recommendations

The Government of Uganda through Ministry of Agriculture Animal Industry and Fisheries (MAAIF) should carry out Mobilization Campaign to sensitize the public about modern methods of farming. This will enable them to have paradigm shift regarding agriculture.

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