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FINANCIAL ACCESS AND GROUNDNUTS PRODUCTIVITY: SMALLHOLDER FARMERS' PERSPECTIVE IN TANZANIA

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Abstract:

This study assessed the contribution of financial access to groundnut productivity of smallholder farming in Kongwa district of Tanzania. A cross-sectional research design was used, utilizing a mixed-method approach that combined quantitative and qualitative data collection techniques. A sample of 105 smallholder farmers was randomly selected from the population. Data was gathered through questionnaires and interviews, and the Cobb-Douglas production function was applied to assess the effect of finance access inclusion on groundnut productivity. Findings revealed that access to credit, improved fertilizers, increased education and training, farmers' age, and livestock ownership presented a significant positive contribution to groundnut productivity. In contrast, large household size and greater distance to the nearest market were associated with decreased groundnut productivity among smallholder farmers. The study recommends an immediate intervention from the government and private sector to educate farmers about credit utilization and encourage the adoption of best farming practices in groundnut production. Additionally, the study suggests initiatives to bring markets closer to the farmers through improved transportation infrastructures. Lastly, financial inclusion policies for smallholder farmers, such as the provision of financial literacy programs and favorable interest rates, will encourage more farmers to access loans and thus increase their livelihoods through increased production productivity. The study carries its application in the area of financial inclusion for small-scale farmers in less developed countries, particularly in rural areas.

Keywords:

Finance access, Groundnut productivity, Smallholder farmers, Tanzania

1. Introduction

Groundnut in Tanzania is the second most important crop in oilseed production after soybeans and the third most significant in edible vegetable oil production (FAO, 2022; Das et al., 2023). Additionally, the study by Das et al. (2023) reported that groundnut is one of the major sources of financial and food security crops for most smallholder farmers in Tanzania. Despite these significances, its production and productivity are reported to be three times lower than in other African countries such as Nigeria and Ethiopia. For instance, a report by FAO (2023; 2020) shows that groundnut yield in Tanzania was 690kg/ha in the year 2020, while in Ethiopia and Nigeria it was 1,806kg/ha and 1,103 kg/ha, respectively. Various factors were reported to be the cause, among these are limited access to credit, unreliable rainfall, and diseases and pests, which together influenced the crop yield in Tanzania (FAO, 2022). Therefore, unlocking the limitation to formal credit and control over pests and diseases among smallholder farmers could significantly improve the productivity of groundnuts in Tanzania. The study by Agbodji and Johnson (2021), illustrated that access to finance is a key factor that influences the productivity of groundnut in most developing countries. This is because agricultural finance access among smallholder farmers involves various services, including credit to financial institutions. Moreover, access to credit to farmers will imply the ability to purchase potential inputs such as fertilizers and improved seeds, which in turn will increase crop production. Farmers, especially in resource-constrained environments like those in Tanzania, often struggle hard to adopt modern farming practices due to limited savings and high interest rates on commercial loans. Providing financial support and access to credit empowers them to overcome these barriers and enhance their production capacity (Yang et al., 2020; Mangasini et al., 2014). Furthermore, access to finance contributes to effective risk management in agricultural activities (Karlan et al., 2012a; Birkenmaier et al., 2019). In general term, access to agricultural finance for smallholder farmers is used as a tool for supporting them in agribusiness and farm-related operations like input procurement, processing, wholesaling, and marketing.

Studies by Ali et al. (2014) and Seluhinga (2023) reported that financial access had a positive effect on farm productivity. This implies that farmers will have access to financial services which gives them the financial capability to acquire and adopt improved technologies and seed varieties. The continued use of technology and improved inputs among smallholder farmers led to an increase in groundnut production and yield (Seluhinga, 2023). Generally, access to agricultural finance among smallholder farmers is a pathway for supporting them in agribusiness and farm-related operations, which include input procurement, processing, wholesaling, and marketing. The limitation on financial access to farmers could hinder them from using improved inputs, which in turn reduce their production and crop yield.

Evidence from previous studies, such as Byedileclara and Mhando (2023) shows that access to credit had a significant influence on smallholder farmers' decisions to invest in farm inputs and places to produce. This is because agricultural production is associated with higher risks, which require more assurance mitigation sources, such as financial resources. Therefore, farmers in most developing countries may hesitate to adopt new technology if they are not linked to sound financial sources. Smallholder farmers in this study will refer to those who cultivate on farm sizes of between 1.0 ha and 3.0 ha by applying traditional techniques using hand hoes and being dependent on rain-fed agriculture.

Groundnut (Arachis hypogaea L) is a self-pollinated leguminous crop mostly produced in tropical and sub-tropical countries, including Tanzania (Janila et al., 2013; Shasani et al., 2020). In 2021, groundnut production was estimated to be 50.7MT globally, of which about 95% of the total production originates from developing countries (FAO, 2022; IPAD, 2021). China and India represent the highest production of groundnut, contributing 46 and 14 percent, respectively of global production. Similarly, Africa contributes about 35 percent of the world's groundnut production. Nigeria, Sudan, Tanzania, Chad, Senegal, and Cameroon are the major groundnut-producing countries in Africa (Mwakimata, 2018). The leading country in Africa is Nigeria, producing about 4.8 million tons, the second country is Sudan with a production of 2.8 million tons, followed by Senegal with 1.7 million tons, and Tanzania producing only 1.1 million tons in the year 2021 (IPAD, 2021). It is estimated that, in developing countries, groundnut contributes to about 25 to 60% of the small-scale farmers' income (FAO,2018; Mwalongo et al.,2020).

Globally, Tanzania is ranked 12th in groundnut production with a total production of 690,000 tons in 2020 and 1.1 million tons in 2021 (USDA, 2021), which is equivalent to 4% of Africa's production (FAO, 2022). Groundnuts in Tanzania have great potential to bring about food security among low-income smallholder farmers due to their multiple benefits and uses. It can be consumed as raw, roasted, or pressed for oil, making it a nutritious and versatile component in diets across both developed and developing nations (Das et al., 2023). In Tanzania, the leading region in groundnut production is Iringa with 33 percent of the total output, followed by Tabora (20 percent), Shinyanga (10 percent), Mbeya (7 percent), and Mtwara (4 percent). Morogoro, Dodoma, and Rukwa are among the major groundnut-producing areas in Tanzania. However, in Dodoma, groundnut production is less than 3 percent of the national average. The selection of Dodoma region as a study area is due to its low groundnut production only 3% of the country's total production. Moreover, Dodoma has experienced an increase in the potential market demand for groundnuts following the shift of the government offices from Dar es Salaam to Dodoma city. This led to the rapid growth in the number of groundnut growers in the Dodoma region, giving the need to undertake this study.

Despite Tanzania being a major groundnut producer in the sub-Saharan region, the productivity of groundnut production in Tanzania has been experiencing a declining trend. For example, in the year 2021, groundnut productivity in Tanzania declined from 1.5 tons/ha to 0.7 tons/ha, which is far below the global average of 1.7 tons per hectare (FAO,2021; FAO, 2022). Findings from the study by Das et al. (2023) illustrated that the groundnut yield in Tanzania did not substantially increase for a number of years. According to Dodoma Municipal Council report (2020), productivity levels of groundnuts in the Dodoma region indicated that the Bahi district produced an average of 0.6 ton/ha, while Kongwa is the lowest-performing district with 0.2 t/ha productivity (UTR, 2021).

Moreover, groundnut farming in Tanzania faces various challenges which include pests, diseases, environmental factors, technology limitations, financial constraints, and institutional barriers. These challenges, as noted by Mangashi et al. (2014), can hinder groundnut production potential for smallholder farmers in Tanzania. Currently, the city of Dodoma is experiencing a rapid population growth trend with a total population of 765,179 people by 2022. This population growth presents an opportunity for assured markets for groundnut smallholder farmers to diversify their income sources and improve their livelihoods. To make the most of this opportunity, improving access to finance for groundnut producers is crucial as highlighted by the World Bank in 2020, finance plays a significant role in boosting agricultural productivity among smallholder farmers. To achieve this goal, a comprehensive study on the contribution of access to finance on the extent of groundnut production and productivity plays a great role.

To address the challenge of declining groundnut production yield trends, various initiatives by public and private sectors have been implemented to enhance groundnut production and productivity through the encouraged use of improved seeds with high yields, drought resistance, and pest resistance. Despite these efforts, groundnut productivity in Dodoma remains low in the Kongwa district, averaging 0.2 tons per hectare. This is thought to be attributed to limited access to credit, both formal and informal financial institutions. Furthermore, despite various government policies, legal frameworks, and institutional measures aimed at increasing groundnut production and providing financial, human, and technical support to small-scale farmers, production has declined over the past two decades. To this end, there is limited empirical literature in Tanzania emphasizing the significance of credit among groundnut farmers in achieving improved productivity.

Different studies have been conducted in Tanzania to explore groundnut production and productivity about credit access. These included studies by Katundu et al. (2014) and Bucheyeki (2010) focused on socioeconomic factors influencing smallholders' groundnut production in Tabora and the adoption of different groundnut varieties. Mwakimata (2018) delved into the socioeconomic implications of gender-specific yield analysis in groundnut production in Tanzania. On the other hand, studies by Das et al. (2023); Mwalongo et al. (2020), Aram (2020), and Siringo et al. (2018) examined production constraints and factors affecting the adoption of specific groundnut traits. Following this review, it can be observed that few of these studies captured the finance access by farmers in the study area and thus created a significant gap in the existing literature that needs to be filled by focusing on the specific dynamics of groundnut production and finance access in a region of Dodoma undergoing rapid urbanization. Therefore, the current study investigated the contribution of finance access to groundnut productivity among smallholder groundnut farmers in the Kongwa District of Tanzania. The results from this study will contribute to a detailed understanding of the importance of financial inclusion by smallholder farmers in developing countries, including Tanzania.

2. Literature Review

2.1. Theoretical Framework Review

This study is hinged on the theory of production, where the production of commodities is determined by both fixed and variable factor inputs, primarily constituting land, labour, capital, and the level of technology. According to the production theory, the production of output will be maximized when inputs (labour, capital, improved seeds, and technology) are optimally combined at the least cost. Thus, a rational producer will always employ the combination of inputs that will maximize output/profit at least factor cost combination (Debertin, 2012; Eryigit and Dulgeroglu, 2015). At this point, the marginal cost (MC) of factor inputs is equal to the price ratio of inputs employed in the production process.

However, for farmers to improve and increase the combination of farm inputs efficiently, access to finance is of paramount importance. Access to credit in agriculture is an important constituent of economic growth and development strategies in most developing economies, such as Tanzania. The study by Seluhinga (2023) indicated that access to credit by farmers will enable them to purchase agricultural inputs such labor, improved seeds, and planting materials, which in turn will increase groundnut productivity. Access to credit in the agricultural sector, theory of the economic behaviour of the rational producer. Where an output/profit maximising farmer will aim to borrow up to where the marginal benefit of credit sought will outweigh the marginal cost (MC). Thus, they will allocate the available resources and use efficiently the available technology to maximize the expected outputs. Therefore, a rational farmer's decision to apply for credit should be based on the fact that the output/profit for having access to credit and getting the full amount that is requested is greater than the output/profit for not having access to the full amount that is requested. Some of the literature that has demonstrated the relationship between agricultural credit and agricultural productivity in economic theory is Agbodji and Johnson (2019). Their work estimates that agricultural credit has a significant impact on agricultural productivity in Togo. A theory is also based on the link between access to credit and its influence on farmers' income and welfare. Similarly, Ali and Awade (2019) establish that access to credit for soybean farmers in Togo has a positive effect on their income and welfare.

2.2. Empirical Literature Review

In developing countries, access to credit by smallholder farmers plays a crucial role in fostering agricultural development. This is because access to finance is a tool for farmers to increase their savings which allows them to purchase advanced technology which in turn improves production and productivity. This increase benefits smallholder farmers by enhancing productivity, enabling asset accumulation, improving food security, and ultimately elevating rural agricultural incomes.

Diallo et al. (2020), Agbodji et al. (2019), and Kashif et al. (2016), for instance, pointed out that credit access has a significantly positive effect in terms of improving agricultural productivity. Furthermore, Diallo et al. (2020) documented that farmers who had access to credit had a higher production than their counterparts at 37.32 percent. In the same vein, Ali et al. (2014) found that the removal of credit constraints among smallholder farmers could increase agricultural productivity by 17%. Similarly, Das et al. (2023) reported that groundnut producers in Tanzania were producing fewer outputs as compared to the quantity of input used. Furthermore, Akudugu (2016) found a significant relationship between credit from formal and informal sources and agricultural production.

Abraham (2018) conducted a study on financial access for rural smallholder farmers and found that access to financial services increased farmers' access to agricultural inputs, which improved their agricultural production and productivity. This will imply that those who access credit services could be in a better position to purchase modern inputs and increase their production activities. Similarly, Simatele & Maciko (2022) reported that poor rural communities who had access to financial services were shown to be more secure in their production and income than those who did not have access to financial services.

The study by Omojolaibi (2020) indicated that most women in Nigeria who had low education levels were economically limited in financial services access, and thus, they were unable to acquire improved inputs to improve their agricultural productivity. On the other hand, Yang et al. (2020) investigated how credit restrictions imposed by formal financial organizations affected the income and health of rural Chinese citizens. The findings showed that restrictions imposed by formal financial institutions on rural poor Chinese farmers negatively impacted their income and health, particularly those disadvantaged groups of men, women, married people, and single people.

Findings from the study by Yang et al. (2020) as cited by Seluhinga (2023) indicated that smallholder farmers in China who were limited to accessing formal financial services produced fewer outputs compared to those who had more access to financial services. This shows how access to credit is important in improving agricultural production and productivity among smallholder farmers in the rural areas of developing countries.

Seluhinga (2023) investigated the factors influencing access to financial services for small-scale farmers in Morogoro region. The finding indicated that older smallholder farmers were more likely to access credit than younger ones in the region. This implies that the likelihood of using formal financial services increased with the age of respondents. Therefore, older farmers were more experienced and resourceful to enabled them to acquire credit from financial institutions and use it to buy inputs for improving agricultural production.

Similarly, findings from the study by Humphrey et al. (2023) indicated that groundnut farmers in Singida region who had access to financial services and technology adopted easily improved groundnut cultivars. Therefore, their early adoption makes them improve groundnut productivity and thus has a better harvest.

Finding from the study by Mwatawala and Kyaruzi (2019) found that in Dodoma, groundnut production suffers from a decline in production due to limited access to finance, resulting in low production and productivity levels. This was supported by studies by Karlan et al. (2012) and Cai et al. (2009), who have shown that improving access to finance can expand farmers' investment options and equip them with better tools to manage risks effectively.

3. Methodology

3.1. Research Design and Study Area

This study utilized the cross-sectional design as researchers believed to collect information from farmers at a single point in time the district. The design has been commonly used in many studies, including that of Humphrey et al.

(2023) and Seluhinga (2023) due to its broad scope of variable inclusions in data collection (Omair, 2015). Both primary and secondary data were collected and employed in the analysis of the study objectives and hypothesis.
The study was conducted in Kongwa District located in the Dodoma region. The purposive sampling technique was used in selecting the Kongwa district due to its continuous decline in groundnut production and productivity. Productivity levels of groundnuts in the district are averaged at 0.1 tons/ha far less than the national average of 1.7 tons per hectare (UTR, 2021; FAOSTAT, 2023). The limitation of groundnut farmers to credit is thought to be a reason for the low level of productivity in the district, among others. This reduced their ability to acquire more inputs and increase their farm productivity.

3.2. Population of the study

The population for this study included smallholder farmers, leaders of farmer organizations, resident extension officers, and local government leaders such as Ward and Village Executive Officers and representatives from local financial institutions. Smallholder farmers include those who cultivate on farm sizes of between 1.0 ha and 3.0 ha by applying traditional techniques using hand hoes and being dependent on rain-fed agriculture (Byedileclara and Mhando 2023).

3.3. Sample Size and Sampling Procedure

Sample Size Determination

The Yamane formula was used to determine the sample size of the study, using a population of 443,867 people. The following formula determined the sample size of the population.

$$n_0 = \frac{(N)}{1+N(e)^2} = 399 \qquad (1)$$

Where no is the sample size, N is the population size, and e is the desired level of precision which is precision.
Results from the formula indicated that the sample size is 399 farmers. According to Saunders et al. (2012), a sample size of 30 individuals could be enough for the study to draw a statistically significant conclusion. Thus, this study uses a sample size of 104 groundnut farmers from the four

3.4. Sampling procedures

A three multiple stage sampling method was used in the selection of the sample size for this study. At the first stage, the purposive sampling technique was used to select the region and Kongwa district as the study area. In the second stage, 4 wards which included Mkoka, Pandambili, Songambele, and Ugogoni were selected based on their potential for groundnut production. Also, six villages were purposively selected and involved in the study; these villages included Ibwaga, Pandambili, Songambele A, Mkoka, Masena, and Chimotolo. Then, the proportional random sampling was used in the selection of groundnut farmers from the six villages at the third stage. The number of farmers selected from each village was determined by the total number of farmers in that village.

Data Collection Methods and Instruments

In the primary data collection, the study used questionnaires, semi-structured interviews, and Focus Group discussions (FGD). Key informants comprised leaders of farmer organizations, resident extension officers, and other local government leaders like Ward and Village Executive Officers, and representatives from local financial institutions. On the other hand, 5 FGDs comprising farmers, extension officers, and local government leaders were formed. A semi-structured questionnaire with open-ended questions was designed and coded, with relevant questions used in collecting survey information for quantitative data, . Self-administered questions were used in the quantitative data collection process from smallholder farmers in the study area. To supplement the quantitative data, qualitative information from key informants and FGD was collected using interview-guided questions.

Analytical Econometric Models

In analysing the influence of access to finance on groundnut productivity among smallholders in Kongwa District, a Cobb-Douglas production function in a modified form was used and estimated. The use of the Cobb-Douglas function is based on the fact of its ability to estimate the partial elasticity of production and marginal productivity for critical factors of production applied by farm households (Ochieng et al., 2011). In other words, it measures the percentage change in that particular input while holding other inputs constant. The general form of the Cobb-Douglas production function is presented as:

$$Y_i = \alpha_i X_1^{\beta_1} X_2^{\beta_2} X_3^{\beta_3} X_4^{\beta_4} \ldots\ldots\ldots\ldots\ldots\ldots X_n^{\beta_n} \ldots\ldots\ldots\ldots\ldots \ldots\ldots \quad (2)$$

Whereby: Y = Quantity of groundnuts produced Xs = Vector of variable inputs applied by the farm household with k=1,2,3…. N βs = Coefficients of change measuring the elasticity of transformation ratio for inputs (X), α = A constant

The general Cobb-Douglas production function was expressed in a linear form by introducing the natural logarithm(ln) to allow the estimation of coefficients and constants for the factors influencing the groundnut productivity, and expressed as:

$$Y_i = \alpha_i + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \ldots.. \beta_{11} \ln X_{11} + \varepsilon_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (3)$$

Where: Y is the output produced per hectare (productivity), α, and β1 − βn, are coefficients or parameters that are quantitatively determined empirically, X1 = Age of farmers (Years), X2 = Education level (years of schooling), X3 = Household Size (Number) , X4 = Quantity of fertilizer used in groundnuts production (kg - both CAN and DAP, X5 = farm size (Acres), X6 = Distance to the Nearest Market (km), X7 = Number of extensionist contact to farmers (number), X8 = Membership to farmers groups and cooperative, X9 = Credits access, X10 = Livestock ownership, X11 = Sex of respondents (Dummy, Male=1, Female =2) and ε = error term.

4. Findings and Discussion

Descriptive Results

Farmer's Education Level

Findings from Table 1 show that the majority (62 %) of the respondents had at least a basic primary-level education, although a significant number of groundnut farmers had no formal education. The level of education of farmers was enough to enable them to understand and interpret well the questions asked by researchers and provide the correct information. On the other hand, the majority to have only primary education could limit them to clearly understand the credit conditions and thus fail to obtain the necessary funds for additional inputs. The results support that of Katundu et al. (2014) that most farmers are less educated and that education may have both cognitive and non-cognitive effects on labour productivity. Similar to these results are those of Das et al. (2023) noted that educated groundnut farmers in Tanzania produced more ground produce compared to the less educated farmers. This is because education enables farmers to be more informed about financial services and marketing functions.

Table 1: Education level of farmers (n=104)

Category	Frequency	Percent
Informa education	25	24.0
Primary education	64	61.5
Secondary education	6	5.8
University Education	9	8.7

Source: Field data (2022)

Finance Access Among Smallholder Groundnut Farmers in Kongwa District

Findings in Table 2 show that about 70% of the farmers in Kongwa district finance their farm inputs from their sources. Additionally, some farmers reported financing the agricultural inputs through the sale of assets such as land, livestock, and other crops. This implies that, majority of them were not easily accessible to agricultural finance services in the district, the things which limited them from acquiring improved inputs to increase groundnut production, as indicated by the lowest district average productivity of 0.1 ton/ha.

Table 2: Sources of financing for farm capital by Farmers in Kongwa District

Category	N	Percent
Personal savings	100	70.4
From friends and relatives	2	1.4
Borrowing from microfinance	1	0.7
Borrowing from Cooperatives/SACCOS/VICOBA	7	4.9
Sale of assets (Crops, land, house, livestock etc)	32	22.5
Total	**142**	**100.0**

Source: Field data (2022)

The Contribution of Access to Finance on Smallholder Farmers' Groundnut Productivity in Kongwa District

The Cobb-Douglas production function was used to analyse the contribution of access to finance to groundnut productivity among smallholder farmers in the Kongwa district. Before the estimation of the effects, diagnostic tests for heteroscedasticity and multicollinearity were done. The Breusch-Pagan test was used in testing the presence of heteroscedasticity data, and results confirmed the absence of the problem. Moreover, the value for R-squared was found to be 0.78, indicating that the variables included in the model explained 78 percent of the variation in groundnut productivity.

The study findings (Table 3) indicated that access to credit was positively significantly related to farmers' productivity with a coefficient of 4.88. This implies that those farmers with access to finance produced more produce, with an increase in productivity of 4.5 units more as compared to those with limited access. These results concur with those of Seluhinga (2023) that access to formal financial credit and an increase in the level of education increased the agricultural production in Morogoro region. The findings are also similar to those of Humphrey et al. (2023) that smallholder farmers who were accessible to credit in Singida were found to adopt easily improved groundnut seeds and hence produced more than those late adopters. Also, similar results were reported by Abares (2023).

Table 3: Contribution of Finance Access on Groundnut Productivity in Kongwa District

Variables	Coef	Std. Error	Sig.
Credit access	4.544	15.258	0.032
Age of farmers	0.215	0.142	0.003
Sex of the respondent	14.021	13.246	0.302
Education level	0.427	0.251	0.002
Household size	-0.362	2.136	0.042
Used fertilizer (kg)	56.429	19.120	0.009
Farm size in 2021	0.602	1.556	0.703
Distance to the nearest village market	-0.404	0.221	0.083
Number of contacts to the extension officer	0.514	0.446	0.034
Membership to a farmer	7.425	15.023	0.627

group or cooperative			
Livestock ownership	1.842	5.811	0.079
Constant	-15.213	30.590	0.624
R	0.862		
R Square	0.781		
F (11, 31)	8.383		

Note: ***Significance at 1%, ** significance at 5%, * significance at 10%

Similarly, the age of groundnut farmers was indicated to have a positive and significant effect on the farmers' access to credit, having a coefficient of 0.21. This implies that older farmers were able to increase groundnut productivity by 21 percent for every unit of increase in years of living. This outcome is consistent with the theory of production, where the increase in years of age translates to accumulated farming experience, which enables the use of more risk mitigation strategies.

Education and training (Table 3) of farmers indicated to increase the productivity of groundnut by 43% for every unit increase in the number of schooling years. This is because education enables farmers to be more informed about financial services and marketing functions, which implies that more outputs will be sold. Similar findings were reported by Das et al. (2023) that in Tanzania, farmers with higher education were producing more outputs as compared to those with lower education. Furthermore, these findings were supported by the findings of Maziku and Mashene (2020), who noted that an increase in the year of schooling among maize farmers in Mbozi and Momba districts is associated with an increase in maize production. Contrarily, the size of the household indicated a negative effect on the groundnut productivity among farmers in the district. This is because the increase in household size increases the household dependence ratio, which also translates to redirecting resources to family care rather than increasing/investing in groundnut productivity.

Farmers with high contact frequency with extension officers displayed a 51% increase in their groundnut productivity in Kongwa district. The increase in productivity is because farmers who interact with extension officers have more access to the best agricultural practices acquired from training and the use of improved agricultural inputs. The use of modern inputs translates to high productivity, resulting from efficient resource utilization.

Additionally, farmers with livestock like cattle indicated to produce more groundnut by two bags as compared with those without livestock. The increase is attributed to the use of animals like cattle in farming activities by the majority of farmers in Kongwa district. The findings are in line with those of Seluhinga (2023) and Humphrey et al. (2023) that households endowed with assets like livestock reported producing more and accessing loans more easily than those who do not own.

Moreover, the use of fertilizer was also observed to increase groundnut productivity by 56 bags per hectare as compared to farmers who do not use fertilizer. This outcome agrees with studies by Assouto and Houngbeme (2020), where fertilizer use helps to enrich the soil mineral content and thus increase crop output. On the other hand, distance to market had a depressive effect in the productivity of groundnut by 40% with a unit increase in the distance to market. The possible explanation for this negative relation could be attributed to an increase in transport costs due to poor roads and other means of transport. High transaction costs reduce the profit margins for a unit of groundnut sold to the market by the farmer.

5.Conclusion of the Study

The study evaluated the contribution of financial inclusion on groundnut productivity in Kongwa district. Based on the study findings, it can be concluded that the level of financial access among smallholder groundnut farmers in Kongwa District is relatively low, as very few of the surveyed farmers reported having accessed credit. The main reason is the lack of education on how farmers can access credit and how to manage such credit to achieve the intended results. The majority of farmers fear the loss of assets and high interest rates on loans from formal commercial banks.

Similarly, access to credit, education, owning livestock, and use of improved fertilizer by farmers were found to be positively related to groundnut productivity among smallholder farmers. This implies that educated farmers can easily access financial services, which enables them to purchase and own assets which including livestock and improved inputs. Additionally, the age of farmers played a crucial role in accessing the credit, with older farmers demonstrating a 21 percent increase in productivity for each year of age. On the other hand, an increase in the number of people in a household and the distance to markets expressed a declining trend in the groundnut productivity. These findings underscore the significance of financial access and other socio-economic factors in shaping groundnut productivity in the study area, offering valuable insights for policymakers and stakeholders in agricultural development in improving the production and productivity of groundnut.

The study recommends immediate government and private sector support and interventional policies that promote financial access for smallholder farmers in the district. Similarly, improvement of transportation infrastructure will bring the market closer to farmers as an initiative to commercialize groundnut farming in the district and foster an increase in productivity. Also, sensitization on the use of fertilized and improved seeds, which fuel the increase in groundnut productivity, would go parallel with the effort to educate farmers on better farming practices, and investment into non-farm activities, which will foster their asset growth and increase creditworthiness. On the other hand, Banks and other financial institutions strategically need to formulate credit policies that favour the inclusion of smallholder farmers in developing countries, including Tanzania.

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