

Financial Intermediation and Agricultural Output among Cooperative Farmers Anambra State, Nigeria

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Abstract: This study investigates the influence of financial intermediation on agricultural output among cooperative farmers in Anambra State, Nigeria. The study modelled the influence of access to credit, availability of loans, banking activities, financial literacy, presence of financial institutions, and use of financial products on farm income serving as a proxy for agricultural output. The research employed a descriptive survey design, utilizing simple percentage, mean, and standard deviation to analyze the demographic and the variable data. Inferential analysis was conducted using the Ordinary Least Squares (OLS) regression technique on a sample of 327 respondents selected through the use of Taro Yamani formula and stratified random sampling. The regression results reveal significant positive relationships between all independent variables and farm income. Specifically, access to credit ($\beta = 0.235$, $p < 0.01$), availability of loans ($\beta = 0.182$, $p < 0.05$), banking activities ($\beta = 0.168$, $p < 0.05$), financial literacy ($\beta = 0.210$, $p < 0.01$), presence of financial institutions ($\beta = 0.195$, $p < 0.01$), and use of financial products ($\beta = 0.160$, $p < 0.05$) significantly influence agricultural income. The findings suggest that increased financial intermediation enhances farmers' capacity to invest in productivity-improving inputs, thereby boosting farm income. Based on these findings, it is recommended that financial institutions should expand their outreach and financial literacy programs to cooperative farmers. Policymakers should also facilitate easier access to credit and diversify financial products tailored to farmers' needs. Strengthening financial infrastructure and promoting financial inclusion will likely improve agricultural productivity and overall rural development in Anambra State.

Keywords: Financial Intermediation, Agricultural Output, Cooperative Farmers, Farm Income, Access to Credit, Availability of Loans, Banking Activities, Financial Literacy

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1. INTRODUCTION

The relationship between financial intermediation and agricultural output has historically been a critical area of inquiry, particularly in developing economies such as Nigeria, where agriculture remains a cornerstone of the national economy. Financial intermediation, broadly defined as the process by which financial institutions facilitate the transfer of funds from savers to borrowers, plays an essential role in fostering economic development by mobilizing savings and allocating resources efficiently (Levine, 2005). In the context of agriculture, this process is vital because farmers often face significant capital

constraints that hinder their ability to invest in productivity-enhancing inputs like improved seeds, fertilizers, and equipment. Historically, rural farmers in Nigeria, including those in Anambra State, have had limited access to formal financial services, which has constrained their capacity to expand production and improve yields, thereby limiting their contribution to national food security and economic growth (Akinola & Adegboye, 2019). The emergence of microfinance institutions and agricultural banks was driven by the recognition that enhancing financial intermediation in rural areas could unlock the latent potential of smallholder farmers, but these efforts have often fallen short of expectations due to structural and systemic barriers. The basic characteristics of financial intermediation involve the collection of savings from the public, the provision of credit, the offering of insurance, and the delivery of other financial products tailored to the needs of different sectors, including agriculture (Honohan & King, 2009). In Nigeria, the agricultural sector is characterized by a predominance of smallholder farmers, many of whom operate within cooperative frameworks that serve as collective economic units. These cooperatives are crucial because they facilitate pooled resources, collective bargaining, and access to credit, yet they often face challenges related to the inadequate availability of financial services. The impact of effective financial intermediation on agricultural output is well-documented; improved access to credit enables farmers to purchase better inputs, adopt new technologies, and expand their cultivated areas, leading to increased yields and income (Ojo & Oladejo, 2020). Conversely, limited or inaccessible financial services often result in low productivity, stagnation, and continued poverty among smallholder farmers, emphasizing the importance of efficient financial intermediation mechanisms.

Access to credit, availability of loans, banking activities, financial literacy, presence of financial institutions, and the use of financial products are interconnected factors that influence farmers' ability to generate income and, by extension, agricultural output. Access to credit is fundamental because it provides the necessary capital for farmers to invest in inputs and innovations; however, in Nigeria, many farmers are excluded from formal credit markets due to lack of collateral, insufficient credit history, or high-interest rates (Ogunleye & Olowookere, 2021). The availability of loans through formal financial institutions can significantly boost farm productivity when properly targeted and delivered, yet many rural areas lack adequate banking infrastructure, limiting farmers' access. Financial literacy is another critical factor; farmers often lack the knowledge required to effectively utilize financial products or understand loan terms, which diminishes the potential benefits of financial services and increases the risk of default (Adebayo & Olamide, 2020). The presence of financial institutions such as commercial banks, microfinance banks, and cooperative societies is a prerequisite for expanding financial intermediation, but their physical presence in rural communities remains limited, creating a spatial and informational gap. The use of various financial products, including savings accounts, insurance, and mobile money services, can further enhance farmers' resilience and capacity to invest, thus positively impacting farm income as a proxy for agricultural output. Despite the recognized importance of financial intermediation for agricultural development, efforts by stakeholders like the government agencies, financial institutions, and development partners have often failed to deliver the expected results. Initiatives such as the National Agricultural Credit Scheme and various microfinance programs aimed at improving farmers' access to credit have experienced implementation challenges, including bureaucratic bottlenecks, high transaction costs, lack of awareness among farmers, and inadequate infrastructure (Eze & Nwosu, 2018). Consequently, many smallholder farmers remain marginalized within the financial system, unable to leverage available services effectively. This persistent gap highlights a significant systemic failure: the mismatch between the designed policies and the actual ground realities faced by farmers. The latent problem of limited financial inclusion among cooperative farmers persists despite the efforts, leading to suboptimal agricultural output and income levels that hinder rural development objectives.

Addressing this latent problem is crucial because agriculture remains the primary livelihood for the majority of Nigerians, especially in rural states like Anambra, where over 70% of the population depends on farming (National Bureau of Statistics, 2022). Improving financial intermediation can unlock farmers' potential to increase productivity, reduce poverty, and promote sustainable rural development. The benefits of addressing these issues extend beyond individual farmers to the entire economy, fostering

food security, creating employment opportunities, and stimulating rural economies. Moreover, an improved financial ecosystem can facilitate the adoption of modern agricultural practices, increase resilience to climate shocks, and enhance the overall competitiveness of the sector. Therefore, understanding the dynamics of financial intermediation and its influence on agricultural output is essential for designing effective interventions that can genuinely transform rural livelihoods and contribute to national development goals. The existing literature on the relationship between financial intermediation and agricultural productivity underscores the importance of contextual factors; however, there remains a significant knowledge gap, particularly within the Nigerian context. Many studies have focused on macroeconomic indicators or national-level financial inclusion without disaggregating data or analyzing specific mechanisms through which financial services influence farm-level outcomes (Akinola & Adegboye, 2019; Ojo & Oladejo, 2020). Additionally, the role of cooperatives as intermediaries in enhancing financial access and their impact on farm income has not been comprehensively studied within the Nigerian setting, especially in Anambra State. This lacuna suggests that existing policies lack nuanced understanding and targeted strategies that could optimize the role of financial intermediation in agricultural development. Filling this gap requires empirical evidence on how different facets of financial service delivery such as credit access, financial literacy, and banking infrastructure interact to influence agricultural output. Such insights are vital for tailoring interventions that are responsive to the unique socio-economic and environmental realities of Nigerian farmers, thereby ensuring more effective resource allocation and policy formulation.

Statement of the problem

The immediate problem that prompted this study is the persistent low agricultural output among cooperative farmers in Anambra State, Nigeria, despite various government and non-governmental interventions aimed at boosting agricultural productivity. Nigeria's agriculture sector continues to be the backbone of the economy, employing over 70% of the rural population and contributing significantly to the gross domestic product (GDP) (National Bureau of Statistics, 2022). However, smallholder farmers, especially those organized in cooperatives, face significant constraints in accessing adequate financial services, which hampers their ability to invest in modern inputs and technology necessary for increasing yields. The failure to effectively mobilize financial resources to support these farmers remains a critical bottleneck, and this problem is worsening as farmer incomes stagnate or decline, raising concerns about food security and rural development. The immediate challenge is that most farmers lack sufficient credit, access to loans, and financial literacy, which severely restricts their capacity to enhance productivity and income levels. This problem is highly topical and recent because the Nigerian government, along with development partners, has intensified efforts to improve financial inclusion and agricultural finance over the past decade (Ojo & Oladejo, 2020). Despite these efforts, empirical evidence indicates that a large proportion of smallholder farmers remain excluded from formal financial markets, and their farm outputs continue to be relatively low compared to potential productivity levels. The situation currently is that a significant number of cooperative farmers are unable to access credit or financial products that could enable them to expand their farms, adopt new technologies, or buffer against risks such as climate shocks. This unacceptable gap between available financial services and farmers' needs warrants urgent empirical investigation to identify the underlying causes and determine effective solutions to bridge this divide.

Theoretically, financial intermediation has the potential to substantially impact agricultural output by providing farmers with the necessary funds to invest in improved inputs, mechanization, and innovation, which in turn increases farm productivity. Access to credit, availability of loans, active banking activities, and the use of diverse financial products such as savings accounts and insurance are crucial factors that influence farmers' income, which can be used as a proxy for agricultural output (Levine, 2005). When farmers have better access to credit and financial services, they can make more productive investments, reduce uncertainty, and expand their farms, leading to higher yields and income. Conversely, limited financial intermediation constrains these opportunities, perpetuating low productivity levels and income disparities among smallholder farmers. This study aims to examine how these financial factors specifically influence the farm income of cooperative farmers in Anambra State, Nigeria.

Previous research efforts have attempted to address the constraints faced by farmers in accessing financial services, focusing largely on microfinance schemes, credit policies, and financial literacy programs. However, these initiatives have often failed to produce the desired outcomes due to systemic issues such as inadequate infrastructure, high transaction costs, and lack of awareness among farmers about available financial products (Eze & Nwosu, 2018). Many of these studies have also been limited in scope, analyzing macro-level data or specific microfinance programs without deep exploration of how individual financial intermediation mechanisms directly impact farm productivity at the local level. If this research is not conducted, the persistent knowledge gap will continue to hinder policymakers' ability to design targeted interventions, which could result in continued low agricultural productivity, increased rural poverty, and food insecurity. The inevitable consequence will be the perpetuation of a cycle of financial exclusion and underdevelopment among cooperative farmers in Anambra State. Therefore, this study is necessary to empirically investigate the precise relationship between financial intermediation and agricultural output among cooperative farmers in Anambra State. It aims to identify the specific barriers to access and utilization of financial services, including the role of financial literacy, the presence of financial institutions, and the use of financial products. The findings will provide evidence-based insights into how improved financial intermediation can lead to increased farm income, serving as a proxy for higher agricultural output. If the problem remains unaddressed, the sector risks continued stagnation, with farmers unable to capitalize on available opportunities for growth, which could have broader negative implications for Nigeria's food security and rural development agenda. Ultimately, this research seeks to fill the existing empirical gap and contribute to the formulation of more effective financial policies tailored to the needs of cooperative farmers in Nigeria.

Objectives of the study

The main objective of this study is to examine financial intermediation and agricultural output among cooperative farmers Anambra State, Nigeria. The specific objectives are to:

1. Determine the effect of access to credit on farm income among cooperative farmers Anambra State, Nigeria
2. Ascertain the effect of availability of loans on farm income among cooperative farmers Anambra State, Nigeria
3. Evaluate the effect of banking activities on farm income among cooperative farmers Anambra State, Nigeria
4. Examine the effect of financial literacy on farm income among cooperative farmers Anambra State, Nigeria
5. Determine the effect of presence of financial institutions on farm income among cooperative farmers Anambra State, Nigeria
6. Ascertain the effect of use of financial products on farm income among cooperative farmers Anambra State, Nigeria

Hypotheses of the Study

H₀₁: Access to credit has no significant effect on farm income among cooperative farmers Anambra State, Nigeria

H₀₂: availability of loans has no significant effect on farm income among cooperative farmers Anambra State, Nigeria

H₀₃: Banking activities has no significant effect on farm income among cooperative farmers Anambra State, Nigeria

H₀₄: Financial literacy has no significant effect on farm income among cooperative farmers Anambra State, Nigeria

H05: Presence of financial institutions on farm income among cooperative farmers Anambra State, Nigeria

H06: Use of financial products has no significant effect on farm income among cooperative farmers Anambra State, Nigeria

2. REVIEW OF RELATED LITERATURE

Financial Intermediation

Financial intermediation is a critical process in economic development, facilitating the transfer of funds from savers to borrowers and enabling productive investments (Levine, 2005). It involves financial institutions such as banks, microfinance institutions, and cooperative societies that serve as intermediaries to channel funds efficiently. Effective financial intermediation reduces transaction costs and information asymmetries, which are particularly significant in rural and agricultural settings (Beck et al., 2014). In developing countries like Nigeria, the strength of financial intermediation directly influences agricultural productivity and rural income levels (Ojo & Oladele, 2021). Recent studies emphasize the importance of a well-developed financial system in promoting inclusive growth. For instance, Akinboade and Kinfack (2020) found that financial intermediation contributes significantly to rural development by providing access to credit, savings, and insurance products tailored for smallholder farmers. Furthermore, financial intermediation facilitates risk mitigation and resource allocation, which are vital for agricultural investments (Beck et al., 2014). However, in many developing economies, financial markets are underdeveloped, and financial institutions often face challenges such as limited outreach and inadequate financial literacy among rural populations (Ojo & Oladele, 2021).

In Nigeria, despite reforms aimed at deepening financial markets, many rural farmers still face barriers such as high transaction costs, lack of collateral, and limited financial literacy (Akinboade et al., 2020). The effectiveness of financial intermediation depends on the institutional capacity to serve smallholder farmers through appropriate financial products and services. Strengthening financial intermediation is essential to unlock the potential of agriculture as a driver of economic growth in Nigeria and similar developing economies (Ojo & Oladele, 2021). The role of financial intermediation in fostering agricultural development underscores the need for policies that enhance the capacity of financial institutions, improve rural outreach, and promote financial literacy. Ensuring that financial services are accessible, affordable, and tailored to the needs of farmers can significantly enhance their productivity and income (Levine, 2005). Future research should focus on evaluating the impact of innovative financial products and mobile banking on agricultural finance in Nigeria, considering the rapidly evolving financial landscape.

Agricultural Output

Agricultural output remains a vital indicator of economic performance, especially in developing countries where agriculture employs a significant portion of the population (World Bank, 2020). It encompasses the total volume of crops, livestock, and other agricultural products produced within a specific period. The level of agricultural output directly influences food security, rural incomes, and national economic stability (Ojo & Oladele, 2021). Enhancing output is thus a priority for policymakers seeking to reduce poverty and achieve sustainable development. Recent empirical evidence indicates that access to financial services, modern inputs, and technological innovations significantly boosts agricultural productivity (Akinboade & Kinfack, 2020). For example, studies in Nigeria show that farmers who have better access to credit and extension services tend to adopt improved technologies, leading to higher yields and increased income (Ojo & Oladele, 2021). Conversely, low productivity levels are often attributed to constraints such as inadequate access to inputs, poor infrastructure, and limited access to markets.

Furthermore, climate variability and environmental challenges continue to threaten agricultural output globally. Adaptation strategies such as climate-smart agriculture, irrigation, and improved seed varieties are increasingly emphasized to sustain and enhance productivity (FAO, 2021). In Nigeria, efforts to

increase agricultural output focus on improving input supply chains, infrastructure, and policy support to create an enabling environment for farmers (World Bank, 2020). Ultimately, increasing agricultural output is essential for achieving food security and economic diversification. It requires a comprehensive approach that integrates access to finance, technology, infrastructure, and supportive policies. Future research should explore the impact of innovative agricultural practices and digital technologies on output levels in Nigeria's diverse agro-ecological zones.

Cooperative Farmers

Cooperative farmers are smallholder farmers who organize themselves into cooperatives to pool resources, share knowledge, and access markets and financial services collectively (Nkurunziza & Muli, 2022). These cooperatives serve as vital platforms for empowering farmers, reducing transaction costs, and improving bargaining power in supply chains (Ojo & Oladele, 2021). Their collective action can lead to increased productivity, income, and resilience against economic shocks. Research shows that cooperative structures enhance farmers' access to inputs, credit, and extension services, thereby improving their productivity and livelihoods (Nkurunziza & Muli, 2022). In Nigeria, cooperative societies are often instrumental in mobilizing rural savings and facilitating access to credit, which are critical for agricultural investments (Ojo & Oladele, 2021). However, the effectiveness of cooperatives depends on their management, organizational capacity, and ability to access supportive policies (Nkurunziza & Muli, 2022).

Furthermore, cooperative farmers face challenges such as governance issues, lack of access to modern technology, and limited linkage with markets (Akinboade & Kinfack, 2020). These challenges can undermine their potential to contribute significantly to agricultural growth. Therefore, strengthening the institutional capacity of cooperatives through training, policy support, and access to financial services is vital for realizing their full potential (Nkurunziza & Muli, 2022). The success of cooperative farmers in improving agricultural output and income hinges on their ability to leverage collective resources effectively. Policies aimed at promoting cooperative development, providing legal frameworks, and facilitating access to financial and technical support are essential (Ojo & Oladele, 2021). Encouraging the formation of well-managed and financially inclusive cooperatives can serve as a catalyst for rural development and poverty reduction in Nigeria.

Access to Credit on Farm Income among Cooperative Farmers

Access to credit is a fundamental factor influencing farm income, particularly for cooperative farmers seeking to finance production inputs and technological innovations (Ojo & Oladele, 2021). Credit enables farmers to overcome liquidity constraints, invest in improved seeds, fertilizers, and equipment, and adopt modern farming practices (Akinboade & Kinfack, 2020). Empirical studies confirm that better credit access correlates positively with higher farm yields and income levels (Mishra et al., 2020). In Nigeria, access to credit remains a significant challenge due to underdeveloped financial markets, high interest rates, and collateral requirements (Ojo & Oladele, 2021). Cooperative farmers often lack the collateral or formal documentation required by banks, limiting their ability to secure loans. Microfinance institutions and agricultural credit schemes have been introduced to address this gap; however, awareness and utilization remain low among smallholder farmers (Mishra et al., 2020).

Research evidence indicates that providing targeted credit facilities to cooperative farmers can substantially increase their farm income. For example, a study by Adegbite et al. (2021) found that cooperative farmers with access to credit experienced a 25% increase in farm income compared to those without access. Credit also allows farmers to adopt risk-reducing practices and diversify their crops, further enhancing income stability. Policy interventions aimed at improving credit access should focus on reducing transaction costs, simplifying loan procedures, and offering flexible repayment terms tailored to agricultural cycles (Ojo & Oladele, 2021). Strengthening the capacity of cooperatives to act as financial intermediaries can also improve credit delivery. Ultimately, expanding access to credit among cooperative farmers is essential for increasing farm income and promoting sustainable agricultural

development.

Availability of Loans on Farm Income among Cooperative Farmers

The availability of loans is a crucial determinant of farm income, especially when farmers seek to invest in inputs and technology to boost productivity (Mishra et al., 2020). Loan availability depends on the capacity of financial institutions to supply credit and the willingness of farmers to borrow based on perceived repayment ability (Ojo & Oladele, 2021). A consistent and accessible source of loans can enable farmers to plan and expand their production activities effectively. In Nigeria, the limited availability of agricultural loans is often attributed to systemic issues such as inadequate funding, risk aversion among lenders, and high default rates (Adegbite et al., 2021). Government-led agricultural credit schemes aim to bridge this gap, but they are often hampered by bureaucratic delays and ineffective targeting (Ojo & Oladele, 2021). As a result, many cooperative farmers remain underserved, which constrains their potential to increase farm income.

Research by Ngwu et al. (2022) highlights that the availability of loans significantly influences farmers' income levels, with those having access to credit experiencing higher productivity and profitability. Loan availability also promotes adoption of improved technologies and diversification, which are key to increasing farm income. Therefore, enhancing the supply and accessibility of loans within financial institutions is vital for agricultural growth. Policy measures should focus on creating a conducive environment for loan provisioning, including reducing collateral requirements, developing risk-sharing mechanisms, and strengthening institutional capacity (Ojo & Oladele, 2021). Additionally, fostering public-private partnerships can help expand loan availability to cooperative farmers. Ensuring a consistent and reliable flow of loans will directly impact farm income and overall agricultural development.

Banking Activities on Farm Income among Cooperative Farmers

Banking activities such as savings, transactions, and credit facilities play a vital role in enhancing farm income among cooperative farmers. These activities enable farmers to manage their finances efficiently, plan investments, and smooth consumption during periods of income fluctuation (Ali et al., 2020). The integration of banking services into agricultural practices facilitates formal financial inclusion, which is crucial for sustainable rural development (Kumar & Singh, 2022). Recent studies indicate that active participation in banking activities correlates positively with higher farm income. For example, Ali et al. (2020) found that cooperative farmers who regularly engaged in banking transactions and savings experienced better resource management and increased investment capacity. Moreover, banking activities provide a mechanism for risk management through savings and credit, which can buffer farmers against shocks such as droughts or pest infestations (Kumar & Singh, 2022).

However, many farmers in Nigeria still underutilize banking services due to lack of awareness, distrust of financial institutions, and logistical barriers (Ojo & Oladele, 2021). Efforts to promote banking activities should include behavioral change campaigns, financial literacy programs, and the extension of banking services to rural and remote areas. The adoption of mobile banking and agency banking models has shown promise in increasing bank activity levels among farmers (Ali et al., 2020). Fostering active banking participation among cooperative farmers can significantly increase their farm income by enabling better financial planning, risk mitigation, and access to credit. Strengthening the linkages between farmers and financial institutions is essential for unlocking the full potential of banking activities in rural Nigeria (Kumar & Singh, 2022). Policymakers and financial service providers must work together to address barriers and expand banking outreach.

Financial Literacy on Farm Income among Cooperative Farmers

Financial literacy is a key factor influencing the capacity of farmers to utilize financial services effectively, thereby impacting their farm income (Mishra et al., 2020). It encompasses knowledge of financial products, credit management, savings, and investment principles, which are essential for making

informed financial decisions (Klapper et al., 2019). Inadequate financial literacy often results in poor financial management, underutilization of financial services, and high default rates among farmers. Recent studies underscore the importance of targeted financial education programs tailored to the needs of smallholder farmers (Nguyen & Doan, 2021). These programs have demonstrated positive outcomes, including increased savings, better credit utilization, and improved investment in productivity-enhancing inputs (Mishra et al., 2020). For instance, in Nigeria, farmers who received financial literacy training showed a 15-20% increase in farm income compared to those without such training (Ojo & Oladele, 2021).

Furthermore, financial literacy influences farmers' ability to assess risks, diversify income sources, and adopt innovative farming practices. It also enhances their understanding of the terms and conditions of financial products, reducing vulnerability to exploitation (Klapper et al., 2019). Addressing the gap in financial literacy is therefore essential for promoting inclusive financial participation and increasing farm income among cooperative farmers. Policymakers should prioritize integrating financial literacy into rural development programs, leveraging extension services, and collaborating with financial institutions to deliver accessible training (Nguyen & Doan, 2021). The use of mobile technology and community-based trainers can expand the reach of financial education initiatives. Overall, improving financial literacy is a cost-effective strategy to enhance the financial behavior and productivity of cooperative farmers.

Presence of Financial Institutions on Farm Income among Cooperative Farmers

The presence of financial institutions in rural areas significantly influences farm income among cooperative farmers by facilitating access to financial services (Akinboade & Kinfack, 2020). Financial institutions, including banks, microfinance institutions, and cooperative societies, provide vital services such as credit, savings, and insurance, which enable farmers to make productive investments (Levine, 2005). The physical presence and active engagement of these institutions in rural communities are therefore critical for agricultural development. Research indicates that proximity to financial institutions reduces transaction costs and enhances farmers' willingness to borrow and save (Klapper et al., 2019). In Nigeria, studies show that cooperative farmers with easy access to financial institutions tend to have higher farm income due to increased investment in inputs, technology, and diversification (Ojo & Oladele, 2021). Conversely, the absence or limited presence of financial institutions exacerbates financial exclusion and constrains income growth.

Furthermore, the presence of financial institutions fosters trust and familiarity, which are essential for encouraging farmers to utilize formal financial services (Akinboade & Kinfack, 2020). It also facilitates the dissemination of financial literacy and innovative financial products tailored to farmers' needs. Strengthening rural financial infrastructure through branch expansion, mobile banking, and agent networks can significantly improve farm income outcomes. Policymakers should incentivize financial institutions to expand their outreach in rural areas, possibly through subsidies, risk-sharing schemes, or regulatory support (Levine, 2005). Public-private partnerships can also enhance the presence and effectiveness of financial services in rural communities. Ultimately, increasing the physical and operational presence of financial institutions is vital for unlocking the full income-generating potential of cooperative farmers.

Use of Financial Products on Farm Income among Cooperative Farmers

The utilization of diverse financial products, such as micro-insurance, microloans, and savings accounts, significantly affects farm income among cooperative farmers (Ngwu et al., 2022). These products are designed to address specific risks and financial needs of farmers, enabling them to invest in productivity-enhancing inputs and adopt innovative practices (Klapper et al., 2019). Proper use of financial products enhances resilience and income stability in the face of environmental and market uncertainties. Research in Nigeria demonstrates that farmers who actively use a variety of financial products tend to have higher and more stable farm incomes. For example, micro-insurance schemes that protect against weather-

related risks enable farmers to invest confidently in inputs and technology, leading to increased yields (Ngwu et al., 2022). Microloans provide the capital necessary for purchasing improved seeds, fertilizers, and equipment, directly contributing to higher productivity (Ojo & Oladele, 2021).

However, the adoption of financial products remains limited due to lack of awareness, mistrust, high costs, and complex procedures (Klapper et al., 2019). Promoting awareness campaigns, simplifying access procedures, and tailoring products to farmers' needs can increase utilization rates. Financial institutions should also develop innovative, affordable, and context-specific products to maximize farm income impacts (Ngwu et al., 2022). Fostering the effective use of financial products holds considerable potential for increasing farm income. It requires coordinated efforts among policymakers, financial service providers, and farmer organizations to improve product design, awareness, and accessibility (Ojo & Oladele, 2021). Expanding the use of suitable financial products is a vital strategy for sustainable agricultural growth in Nigeria.

Summary and Gap in Literature

The existing literature underscores the critical role of financial intermediation, access to credit, and the use of financial products in enhancing farm income among cooperative farmers, particularly in developing countries like Nigeria. Studies have shown that financial inclusion improves productivity, resilience, and income stability (Levine, 2005; Akinboade & Kinack, 2020). However, despite these findings, significant gaps remain in understanding how specific financial services influence farm income across different agro-ecological zones and farming systems. Most research concentrates on macroeconomic or national-level analyses, with limited focus on micro-level, farm-specific outcomes. There is also a paucity of longitudinal studies examining the long-term impact of financial interventions on farm income and sustainability. Furthermore, many studies highlight barriers such as limited financial literacy, infrastructural deficits, and cultural factors, but few offer comprehensive, context-specific solutions or evaluate the effectiveness of integrated approaches (Ngwu et al., 2022; Ojo & Oladele, 2021).

Another notable gap concerns the role of emerging financial technologies, such as mobile banking and digital platforms, in expanding financial services to rural farmers. While these innovations have the potential to transform agricultural finance, empirical evidence of their impact on farm income remains limited and context-dependent (Kumar & Singh, 2022). Additionally, more research is needed to explore how the synergy between financial institutions, government policies, and farmer organizations can be optimized for inclusive growth. Addressing these gaps requires rigorous, context-specific research that employs mixed-methods approaches, longitudinal data, and experimental designs. Future studies should also evaluate the effectiveness of tailored financial products and digital innovations in improving farm income and sustainability. Such insights will inform policy and program development to bridge the existing gaps in agricultural finance literature.

3. THEORETICAL FRAMEWORK

The theoretical framework underpinning this study is primarily grounded in the *Financial Intermediation Theory*, which emphasizes the pivotal role of financial institutions in channeling funds from savers to investors, thereby fostering economic growth and development. This theory, with its roots in the work of Goldsmith (1969) and Shaw (1973), posits that the efficiency and depth of financial intermediation directly influence the capacity of economic agents such as farmers to access credit and financial services necessary for productive investments. Goldsmith (1969) highlighted that well-developed financial systems facilitate savings mobilization and resource allocation, which are crucial for investment in sectors like agriculture. Similarly, Shaw (1973) argued that financial development alleviates resource constraints faced by entrepreneurs, including smallholder farmers, by providing the necessary financial tools to expand production. The core assumption of this theory is that an efficient and accessible financial system will promote increased investment in productive activities, leading to higher output and income levels among borrowers.

This theory assumes that financial institutions serve as intermediaries that reduce transaction costs, mitigate information asymmetry, and manage risks associated with lending, especially to small-scale farmers who are often perceived as high-risk borrowers (Levine, 2005). It presumes that the presence and accessibility of financial services such as credit, savings, insurance, and other financial products are fundamental determinants of investment capacity and productivity. Furthermore, the theory assumes that financial development is positively correlated with economic growth because it enables entrepreneurs and farmers to invest in productivity-enhancing inputs and technologies, thereby increasing output levels. In the context of this study, these assumptions imply that the level of financial intermediation available to cooperative farmers in Anambra State directly influences their ability to acquire credit, utilize financial products effectively, and expand their agricultural activities.

Applying the Financial Intermediation Theory to this study, it suggests that the degree of financial development—characterized by access to credit, availability of loans, presence of financial institutions, and financial literacy—determines the extent to which cooperative farmers can enhance their agricultural output. If farmers are able to access adequate financial services, they can invest in improved seeds, fertilizers, equipment, and technology, which are essential for increasing productivity. Conversely, if financial intermediation is weak or inaccessible, farmers are constrained in their investments, resulting in low yields and farm income. The theory thus provides a conceptual basis for analyzing how the strength and efficiency of financial intermediation mechanisms influence agricultural output among cooperative farmers in Anambra State, Nigeria. It underscores the importance of developing inclusive financial systems that effectively serve smallholder farmers to promote rural development and agricultural growth.

The Financial Intermediation Theory offers a robust framework for understanding the relationship between financial services and agricultural productivity. Its assumptions about the positive effects of accessible and efficient financial systems on investment and output directly inform this study's focus. By examining the role of financial intermediation through access to credit, loans, and financial products, this research aims to elucidate how these factors influence farm income and overall agricultural output among cooperative farmers. Addressing the gaps in financial accessibility and literacy, as prescribed by the theory, could significantly enhance the sector's productivity, thereby contributing to Nigeria's broader economic development goals.

4. METHODOLOGY OF THE STUDY

Research Design

This study employed a descriptive research design to systematically gather, analyze, and present data on the influence of financial intermediation on the income of cooperative farmers in Anambra State. The descriptive approach was chosen to accurately depict the current state of financial inclusion and its impact on agricultural income, providing a clear understanding of the relationships among the variables without manipulating any factors.

Area of Study

The research was conducted in Anambra State, Nigeria, which is characterized by a diverse population engaged predominantly in agriculture and small-scale trade. The state has a population of over 4 million people, with a significant proportion involved in socio-economic activities such as farming, trading, and small business enterprises. Geographically, Anambra is situated in the southeastern region, featuring lush green lands suitable for farming, with a mix of rural and semi-urban environments. Culturally, the state is rich in Igbo traditions, with a vibrant community life that influences local economic activities. The environment is generally conducive to agriculture, with fertile soil and a favorable climate supporting crop cultivation and livestock rearing.

Population of the Study

The population for this study comprised all members of agricultural cooperatives across Anambra State. The study's population encompasses all members of agricultural cooperatives in Anambra State, Nigeria

Among these cooperative societies, 3,856 are specifically categorized as agricultural cooperatives, with a combined membership of 23,484 individuals. These cooperative members are directly involved in farming activities and are expected to have varying degrees of access to financial services, making them ideal respondents for assessing the impact of financial intermediation on farm income.

Sample Size and Sampling Technique

Using a multi-staged sampling technique, the study determined a sample size of 497 respondents. The first stage involved selecting local government areas within the state through random sampling. In the second stage, cooperative societies within these areas were purposively selected based on their active participation in financial activities. Finally, respondents were chosen through systematic random sampling from each cooperative society's membership list, ensuring a representative sample that reflects the demographic and socio-economic diversity of the cooperative farmers.

Method of Data Collection

Primary data was collected directly from the respondents through structured questionnaires. This method was chosen because it allows for the collection of firsthand information on respondents' socio-economic backgrounds, financial practices, access to financial services, and income levels.

Data Collection Instrument

The primary instrument used for data collection was a structured questionnaire, designed to capture quantitative data on variables related to financial intermediation and farm income. The questionnaire included sections on demographic information, access to credit, banking activities, financial literacy, and income levels.

Validation of Instrument

The questionnaire was subjected to content validation by experts in agricultural finance and social sciences to ensure that it effectively covered all relevant aspects of the study. Additionally, pre-testing was conducted with a small sample of cooperative farmers outside the study area to ensure clarity, relevance, and comprehensiveness of the questions.

Reliability of the Instrument

The reliability of the questionnaire was assessed using Cronbach's alpha coefficient, which yielded a value of 0.82, indicating acceptable internal consistency. This ensures that the instrument reliably measures the constructs of interest and produces consistent results across different respondents.

Method of Data Analysis

Data analysis involved both descriptive and inferential statistics. Descriptive statistics such as frequency distributions, simple percentages, means, and standard deviations were used to summarize respondents' characteristics and responses. Inferential analysis was conducted using the regression technique of Ordinary Least Squares (OLS) to examine the relationship between financial intermediation variables and farm income, allowing for the identification of significant predictors and the strength of their influence.

5. PRESENTATION OF EMPIRICAL RESULTS

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	198	60.6
	Female	129	39.4
Age Group			
	20-29	45	13.8
	30-39	102	31.2
	40-49	75	22.9
	50-59	60	18.3
	60 and above	45	13.8
Educational Level			
	Primary Education	125	38.2
	Secondary Education	138	42.2
	Tertiary Education	64	19.6
Marital Status			
	Single	78	23.8
	Married	204	62.4
	Widowed/Divorced	45	13.8
Household Size			
	1-4 persons	102	31.2
	5-8 persons	153	46.8
	9 or more persons	72	22.0
Farm Size (hectares)			
	0.5 - 1.0	105	32.1
	1.1 - 2.0	138	42.2
	Above 2.0	84	25.7
Annual Income (₦)			
	50,000 - 100,000		
	101,000 - 150,000		
	Above 150,000		
		327	100

Source: Field Survey. 2025

The sample comprises 60.6% males and 39.4% females, indicating a gender imbalance favoring male respondents. This distribution reflects traditional gender roles in agriculture, where males often dominate farm activities, especially in rural areas. The higher male participation suggests that male farmers might have more access to resources, extension services, and financial products, but it also highlights the need to empower female farmers to bridge gender gaps in agricultural productivity and financial inclusion.

Respondents are predominantly in the 30-39 age bracket (31.2%), which is often considered the most productive age group for farming activities. The presence of respondents across all age groups, including those 60 and above (13.8%), indicates a diverse age range, with both young and older farmers involved. The substantial participation of middle-aged farmers suggests a potentially sustainable farming community, but the notable proportion of older farmers may also signal upcoming challenges related to labor force sustainability and knowledge transfer.

A significant majority have formal education, with 42.2% having secondary education and 19.6% with tertiary education. Primary education is also prevalent at 38.2%. This suggests that most farmers possess basic to moderate levels of literacy, which is advantageous for understanding and utilizing financial products, adopting new technologies, and engaging with extension services. The relatively high level of education serves as a strong foundation for improving farm productivity through knowledge-based

practices.

A majority of respondents (62.4%) are married, which has implications for household labor, income pooling, and decision-making processes. The presence of singles (23.8%) and widowed/divorced individuals (13.8%) indicates diverse household dynamics. Married farmers might benefit from shared resources and support, whereas singles or widowed farmers may face different challenges related to resource access and economic stability.

Most households (46.8%) have 5-8 members, which aligns with typical rural household sizes that provide ample labor for farming activities. Larger households can enhance productivity through available labor but may also strain household resources if income is insufficient. Smaller households (1-4 persons) may face labor shortages but could have lower consumption needs.

Farm sizes range from 0.5 to above 2 hectares, with the highest proportion (42.2%) owning 1.1-2.0 hectares. Smallholder farms are predominant, which is typical in many developing regions. Larger farms above 2 hectares, though fewer, may have more diversified production and higher income potential. Farm size influences income levels, access to credit, and adoption of modern farming practices.

Most respondents earn between ₦101,000 and ₦150,000 annually (42.2%), with a considerable proportion earning above ₦150,000 (34%). Income levels reflect modest earnings, common among smallholder farmers, but also show potential for growth. Income variability suggests differing levels of productivity, access to inputs, and market opportunities, underpinning the importance of financial inclusion and capacity building to enhance income.

Descriptive Statics

Table 3: Descriptive Statics on financial intermediation and agricultural output among cooperative farmers Anambra State, Nigeria

Variable	Mean	Std Dev
Access to Credit	3.45	0.89
Availability of Loans	3.20	0.75
Banking Activities	3.60	0.80
Financial Literacy	2.85	0.95
Presence of Financial Institutions	3.55	0.85
Use of Financial Products	2.90	1.00

Source: Field Survey. 2025

Access to Credit shows a Mean of 3.45 and SD of 0.89. On average, farmers in the sample rated their access to credit as slightly above the midpoint of the scale, indicating a moderate level of perceived access. The standard deviation suggests some variability among farmers' perceptions - while many feel moderately well-served, others experience significant barriers. This variation underscores the importance of targeted interventions to improve credit accessibility, particularly for those who perceive themselves as poorly served.

Availability of Loans have a Mean of .20 and SD of 0.75) thus, the mean score indicates that farmers perceive the availability of loans as moderately accessible. The relatively lower mean compared to other variables suggests that some farmers might still face challenges in obtaining loans. The standard deviation shows a reasonable spread, implying that while some farmers find loans readily available, others encounter difficulties. Enhancing loan availability could thus be a strategic focus to improve farmers' financial capacity.

For Banking Activities it has Mean = 3.60 and SD = 0.80. Showing farmers report engaging in banking activities at a level slightly above average, reflecting a moderate but promising level of banking engagement. The standard deviation indicates varied levels of activity, with some farmers actively using banking services such as savings and transactions, while others are less engaged. Promoting deeper

banking relationships could further enhance financial inclusion and productivity.

Financial Literacy has a Mean of 2.85 and SD of 0.95. The mean score suggests that, on average, farmers perceive their financial literacy as just below the midpoint, indicating room for improvement. The high standard deviation points to significant disparities - some farmers possess good financial knowledge, while others are quite limited. Implementing financial education programs tailored to farmers' contexts could elevate overall financial literacy levels and improve their ability to utilize financial services effectively.

Presence of Financial Institutions has a Mean of 3.55 and SD of 0.85. This shows that farmers generally perceive a relatively high presence of financial institutions in their areas, which is encouraging for financial outreach. The variability suggests that while most farmers recognize the availability of financial institutions nearby, some areas may lack sufficient infrastructure. Expanding physical presence and outreach efforts could address these gaps and foster greater financial inclusion.

Use of Financial Products reveals a Mean of 2.90 and SD of 1.00. The average score indicates moderate use of diverse financial products, such as insurance or savings accounts. The high standard deviation reflects considerable variation - some farmers actively utilize multiple financial products, whereas others do not use them at all. Increasing awareness and accessibility of financial products can encourage broader adoption, thereby strengthening farmers' financial resilience.

Regression Results

Table 3: Regression Results on financial intermediation and agricultural output among cooperative farmers Anambra State, Nigeria

Variable	Coefficient (β)	Standard Error	t-Statistic	Sig. Level
Constant	2.500	0.400	6.25	0.000**
Access to Credit	0.235	0.065	3.62	0.000**
Availability of Loans	0.182	0.058	3.14	0.002**
Banking Activities	0.168	0.067	2.51	0.012*
Financial Literacy	0.210	0.060	3.50	0.001**
Presence of Financial Institutions	0.195	0.064	3.05	0.003**
Use of Financial Products	0.160	0.069	2.32	0.021*
R	0.752			
R ²	0.565			
Adjusted R ²	0.552			
F-Statistic	42.34			0.000

Source: Field Survey. 2025

Note: ** $p < 0.01$, * $p < 0.05$

The regression analysis provides compelling evidence that financial intermediation significantly influences agricultural output, as measured by farm income among cooperative farmers in Anambra State. Each independent variable demonstrates a positive and statistically significant relationship with farm income, underscoring the importance of various facets of financial inclusion.

This coefficient - Access to Credit ($\beta = 0.235$, $p < 0.001$) - indicates that for every one-unit increase in farmers' access to credit, farm income is expected to increase by approximately 0.235 units, holding

other variables constant. This strong and significant relationship emphasizes the pivotal role of credit in enabling farmers to acquire vital inputs such as seeds, fertilizers, and equipment, which are essential for increasing productivity. The high significance level suggests that expanding credit facilities can be a powerful strategy to elevate agricultural output, reduce income disparities, and foster rural development.

The positive coefficient - Availability of Loans ($\beta = 0.182, p < 0.01$) - signifies that greater availability of loans correlates with higher farm income. This indicates that when farmers perceive loans as accessible and obtainable, their capacity to invest in productivity-enhancing activities improves, ultimately leading to increased income. The statistical significance highlights that policy efforts to streamline loan procedures and reduce barriers could substantially benefit farmers' economic well-being.

Banking Activities ($\beta = 0.168, p < 0.05$). Here, the active engagement with banking services such as savings, transaction handling, and financial planning correlates positively with farm income. This suggests that farmers who regularly interact with banking institutions are better positioned to manage financial risks, access credit, and plan investments effectively. Promoting banking literacy and encouraging routine banking activities can thus serve as catalysts for enhancing agricultural productivity.

Financial Literacy has ($\beta = 0.210, p < 0.01$). The significant positive impact of financial literacy underscores the importance of financial knowledge in empowering farmers to make informed decisions regarding savings, credit, and investment. Farmers with higher financial literacy are more likely to utilize available financial services effectively, avoid predatory lending, and optimize resource allocation, leading to increased farm income. This finding advocates for targeted financial education programs tailored to farmers' needs to maximize their financial inclusion and productivity.

Presence of Financial Institutions has ($\beta = 0.195, p < 0.01$). The existence of accessible financial institutions within proximity enhances farmers' ability to access financial services conveniently. The positive coefficient signifies that increased physical presence and outreach of financial institutions directly contribute to higher farm income. Strengthening the infrastructure and geographic reach of financial services is crucial for fostering inclusive growth in rural agriculture.

Use of Financial Products ($\beta = 0.160, p < 0.05$). this shows that diversification and utilization of various financial products such as insurance, savings accounts, and microloans are associated with increased farm income. This suggests that financial products tailored to farmers' needs can mitigate risks, stabilize income, and facilitate investments. Promoting awareness and accessibility of such products can significantly improve farmers' economic resilience and productivity.

The model explains approximately 56.5% of the variability in farm income ($R^2 = 0.565$), indicating a substantial explanatory power. The high F-statistic (42.34, $p < 0.001$) confirms that the collective influence of the independent variables is statistically significant and that the model provides a reliable explanation for variations in agricultural output. Given these robust findings, policy interventions should prioritize expanding access to credit and loans, particularly through simplified procedures and collateral-free schemes tailored for smallholder farmers. Financial literacy campaigns must be intensified to equip farmers with the knowledge necessary to navigate and utilize financial services effectively. Strengthening the presence of financial institutions in rural areas, coupled with the promotion of diverse financial products, will create an enabling environment for sustainable agricultural growth. Fostering a comprehensive financial ecosystem that enhances access, literacy, and usage of financial services is vital for unlocking the full potential of cooperative farmers in Anambra State. Such measures will not only increase farm income but also contribute to broader rural development, poverty reduction, and food security in Nigeria.

6. SUMMARY AND RECOMMENDATIONS

1. With respect to access to credit, findings revealed that a one-unit increase in farmers' access to credit significantly boosts farm income by approximately 0.235 units, indicating that improved credit access is a key driver of agricultural productivity.

2. Availability of Loans revealed that enhanced perceived availability of loans correlates positively with farm income, with each unit increase leading to a rise of 0.182 units in income, emphasizing the importance of accessible financing options.
3. Banking Activities shows that active engagement with banking services is associated with a 0.168 unit increase in farm income per unit rise in banking activity, highlighting the role of financial behavior in agricultural success.
4. Financial Literacy: revealed that higher levels of financial literacy significantly contribute to increased farm income, with a 0.210 unit rise for each unit increase in financial knowledge, underscoring the value of financial education.
5. Presence of Financial Institutions shows that the proximity and outreach of financial institutions are positively related to farm income, with each additional unit increase in institutional presence raising income by 0.195 units.
6. Use of Financial Products revealed that utilization of diverse financial products correlates with a 0.160 unit increase in farm income, illustrating the importance of financial diversification in stabilizing and enhancing earnings.

The study conclusively demonstrates that financial intermediation significantly influences the income levels of cooperative farmers in Anambra State, with key factors such as access to credit, availability of loans, active banking participation, financial literacy, presence of financial institutions, and diversified financial product usage all positively impacting farm income. These findings show the critical importance of enhancing financial inclusion and literacy in rural agricultural communities to unlock their full productivity potential. Effective policy measures aimed at improving access to financial services, expanding the reach of financial institutions, and promoting financial education are essential to fostering sustainable agricultural development, reducing income disparities, and driving broader economic growth in the region.

Recommendations

This study recommends that:

1. The Central Bank of Nigeria, in collaboration with federal and state governments, develops targeted credit schemes specifically designed for smallholder farmers in Anambra State. These institutions should streamline loan application procedures, reduce bureaucratic barriers, and offer affordable interest rates to ensure that farmers, particularly the most vulnerable, can access the necessary funds to expand their agricultural activities. Implementing these measures will directly increase farmers' capacity to invest in productivity-enhancing inputs, leading to higher agricultural output and income.
2. Financial regulatory authorities, in partnership with commercial banks and microfinance institutions, must prioritize expanding their physical presence and outreach in rural areas of Anambra State. This can be achieved through establishing more rural branches, mobile banking units, and agent banking networks. Such infrastructure improvements are essential to bringing financial services closer to farmers, reducing travel costs, and overcoming geographical barriers. Strengthening financial infrastructure will ensure consistent access to banking services, fostering financial inclusion and supporting farmers' productivity.
3. The Nigerian Financial Intelligence Unit, in conjunction with cooperative societies, agricultural extension services, and non-governmental organizations, should design and implement comprehensive financial literacy programs tailored specifically for farmers. These programs should focus on enhancing farmers' understanding of credit use, savings, investment opportunities, and risk management. Equipping farmers with financial knowledge will enable them to make informed decisions, effectively utilize available financial products, and manage their finances sustainably, thereby positively impacting their farm output.

4. Financial institutions and government agencies should collaborate to conduct targeted awareness campaigns and capacity-building workshops aimed at motivating farmers to actively engage with banking services. These initiatives should emphasize the benefits of savings, regular banking transactions, and credit utilization. By fostering a culture of banking engagement, farmers will be better positioned to leverage formal financial services for their agricultural needs, which will translate into increased productivity and income.
5. Regulatory authorities and financial service providers must innovate and introduce a broad range of financial products tailored to the needs of farmers, such as micro-insurance, microloans, and savings accounts. Such diversification will allow farmers to manage risks associated with climate variability, pests, and market fluctuations, while also providing capital for investments in technology and inputs. Promoting these products will lead to more resilient farming practices and enhanced productivity.
6. Policymakers at the federal and state levels must formulate and enforce policies that integrate financial services into broader agricultural development initiatives. This includes establishing supportive legal frameworks, funding capacity-building programs, and incentivizing financial institutions to serve rural farmers effectively. Institutional support is crucial for creating an inclusive financial environment that ensures all farmers, regardless of scale or location, can benefit from financial services, ultimately leading to sustainable agricultural growth in Anambra State.

Implications of the Study to the Economy

This study underscores the critical role of financial intermediation in boosting agricultural productivity, which is a cornerstone of rural economic development. By demonstrating that access to credit, availability of loans, banking activities, financial literacy, presence of financial institutions, and use of financial products significantly influence farm income, the findings highlight the need for targeted financial inclusion policies. Strengthening these aspects will not only elevate farm incomes but also stimulate broader economic activities such as agro-processing, transportation, and retail trade, thereby contributing to poverty reduction and improved living standards in rural communities.

Furthermore, the enhanced financial access and literacy can lead to increased investment in modern farming technologies, better risk management, and sustainable agricultural practices. These improvements will foster a resilient agricultural sector capable of withstanding economic shocks and climate variability. As agriculture remains a vital sector in Nigeria's economy, especially in states like Anambra, such financial inclusion initiatives can catalyze national economic growth, reduce unemployment, and promote socio-economic stability in rural areas.

Contribution of the study to knowledge

This study makes a significant contribution to the existing body of knowledge by empirically establishing the vital link between financial intermediation and agricultural income among cooperative farmers in Anambra State. It provides nuanced insights into how various dimensions of financial inclusion such as access to credit, loan availability, banking activities, financial literacy, and the use of financial products collectively influence farm productivity and income levels. By quantifying these relationships, the study offers evidence-based support for policymakers and financial institutions to develop targeted interventions that enhance financial access and literacy, specifically tailored to the needs of smallholder farmers in rural Nigeria.

Furthermore, the research enriches the understanding of the role that financial infrastructure and outreach play in fostering inclusive growth in the agricultural sector. It highlights the importance of physical presence and availability of financial institutions in rural areas as catalysts for increased farm income and economic resilience. This knowledge contributes to the broader discourse on financial inclusion as a driver of rural development and can serve as a basis for future studies exploring similar dynamics in different regions or sectors, thereby advancing the academic understanding of the intersection between finance and agricultural productivity.

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