

Assessing the Impact of Microfinance on Agricultural Productivity and Income of Smallholder Farmers in Rural Nigeria

Running title: Microfinance, Agricultural Productivity, and Smallholder Farmer Income in Rural Nigeria

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PUBLICATION METADATA	
Issue	Vol. 1 No. 1
Pages	22-34
Published Online	14 th Aug, 2026
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ABSTRACT

The study assesses the impact of microfinance on agricultural productivity and income of smallholder farmers in rural Nigeria. The specific aims were to assess the impact of loan tenure on agricultural production and the income of smallholder farmers, and to assess the impact of loan size on agricultural production and the income of smallholder farmers in rural Nigeria. The research methodology used for this study was a descriptive survey. Data collection for the study was done by means of a questionnaire developed by the researcher, which had a five-point Likert scale format. Analysis of the data obtained from the questionnaire was conducted by use of descriptive statistics such as frequency and percentages, and inferential statistics such as Chi-square (χ^2). Frequency and percentages were used for the analysis of demographic characteristics and research questions, whereas Chi-square (χ^2) was used to test the hypotheses. The result revealed that Loan Tenure has a significant effect on agricultural productivity and income of smallholders, with a P-value of $(0.000 < 0.05)$. Loan Size has a significant effect on agricultural productivity and income of smallholder farmers, with a P-value of $(0.025 < 0.05)$, in rural Nigeria. The study concluded that microfinance has a significant positive impact on the agricultural productivity and income of smallholder farmers in rural Nigeria. The study recommended that microfinance institutions (MFIs) should intensify efforts to reach more smallholder farmers through targeted credit schemes and flexible loan products designed around the agricultural production cycle.

Keywords: Agricultural; Income; Microfinance; Productivity; Smallholders

Subject Categories: Development Finance; Agricultural Economics; Rural Development

1. INTRODUCTION

1.1 Introduction

The agricultural sector continues to be the mainstay of the Nigerian economy because of its high employment level that accounts for more than one-third of the total labor force in the country (World Bank, 2023). The agricultural sector in Nigeria continues to perform below expectations because of its structural inefficiencies resulting from its low productivity, inadequate access to finance, and a dependence on smallholder production systems. Smallholder farmers—who cultivate less than two hectares on average—account for over 80% of total food production but operate under severe constraints, including limited mechanization, poor infrastructure, and high vulnerability to climate shocks (FAO, 2021; NBS, 2022). Among these challenges, access to affordable and timely credit remains one of the most persistent barriers to sustainable rural development.

Over the past three decades, microfinance has been promoted as a strategy to alleviate poverty, stimulate rural enterprise, and enhance agricultural productivity among resource-constrained farmers (Kiplagat et al., 2020). In Nigeria, the establishment of Microfinance Banks (MFBs) in 2005 and subsequent policy revisions have aimed to extend financial inclusion to the unbanked, especially those in rural and agrarian communities (Central Bank of Nigeria [CBN], 2020). These institutions were envisaged to provide small loans, savings services, and capacity-building programs tailored to the needs of low-income populations. For smallholder farmers, microfinance serves not only as a source of working capital for inputs such as seeds, fertilizers, and pesticides but also as a means of smoothing consumption, diversifying income streams, and mitigating risk (Afolabi, 2021; Okonkwo & Agu, 2022).

However, despite substantial government and donor efforts to promote rural microfinance, empirical evidence on its effectiveness in driving agricultural productivity and improving farmers' income remains mixed. Some studies report that microfinance significantly enhances yield, adoption of improved farming technologies, and household income (Ozor et al., 2022; Adeoti et al., 2023). Others argue that high interest rates, loan default, and limited outreach to women and marginalized farmers undermine its long-term developmental impact (Nwosu & Ogu, 2021; Ezeanyejì et al., 2023). This divergence underscores the importance of context-specific assessments that account for regional variations in institutional performance, farmer characteristics, and agricultural systems across Nigeria.

Rural Nigeria presents an illustrative case where financial exclusion intersects with developmental vulnerability. Despite hosting over 60% of the country's population, rural areas account for less than 25% of formal financial service penetration (CBN, 2020; EFinA, 2022). Traditional banks often avoid these regions due to perceived risks, low profitability, and lack of collateral from smallholders. Consequently, informal finance such as cooperative societies, rotating savings groups, and family networks remains a dominant but limited mechanism for credit access (Adeniran & Yusuf, 2019). Microfinance institutions thus fill a critical void between informal mechanisms and commercial banking, offering a potential pathway toward inclusive agricultural transformation.

Assessing the impact of microfinance on agricultural productivity and income is therefore crucial for both scholarly and policy reasons. From a policy standpoint, credible evidence can inform the design of targeted financial interventions that align with Nigeria's National Financial Inclusion Strategy (NFIS, 2022) and the Agricultural Promotion Policy (APP) aimed at boosting domestic food production and rural incomes. Academically, it contributes to debates on whether microfinance functions primarily as a poverty alleviation tool or as a genuine catalyst for production-driven growth. This study, therefore, seeks to evaluate how microfinance interventions affect the agricultural productivity and income levels of smallholder farmers in rural Nigeria. In doing so, it aims to identify the mechanisms, such as access to credit, training, and capital accumulation, through which financial inclusion influences agricultural outcomes. The analysis will not only contribute to

an understanding of the microfinance-agriculture nexus but also provide actionable insights for policymakers, development agencies, and financial institutions striving to enhance the resilience and competitiveness of Nigeria's rural economy.

1.2 Statement of the Problem

While microfinance has gained recognition as an instrument that could contribute to improving the welfare of smallholder farmers, research on how effective it has been in increasing agricultural productivity and incomes for smallholder farmers in rural Nigeria is not well-developed. In spite of being the majority of the agricultural labor force, smallholder farmers in rural Nigeria encounter barriers in the form of lack of funds, lack of adequate farming techniques, and lack of resources, which inhibit them from generating maximum productivity and earnings.

The role of microfinance institutions (MFIs) becomes evident here by delivering financial services suited for the smallholder farmers. Nonetheless, studies on the effectiveness of microfinance in influencing agricultural performance and incomes in this regard have not been empirically explored. This leads to the following research question: What effect has access to microfinance had on the productivity and income levels of smallholder farmers in rural Nigeria?

Additionally, the challenges faced by these farmers in accessing and effectively utilizing microfinance raise concerns about the sustainability and long-term benefits of such financial interventions. Without a comprehensive assessment of these factors, policymakers and stakeholders may struggle to develop effective microfinance strategies that truly benefit this vulnerable population. This study aims to fill this gap by systematically evaluating the relationship between microfinance access, agricultural productivity, and income levels among smallholder farmers in rural Nigeria, while also identifying barriers to effective use of financial services. The findings will contribute to understanding how microfinance can be optimized to support agricultural development and improve the livelihoods of smallholder farmers.

1.3 Objective of the Study

The main objective of this study is to assess the impact of microfinance on agricultural productivity and income of smallholder farmers in rural Nigeria. The specific objectives were to:

- i. Examine the effect of Loan Tenure on Agricultural Productivity and Income of Smallholder Farmers in Rural Nigeria.
- ii. Evaluate the effect of Loan Size on Agricultural Productivity and Income of Smallholder Farmers in Rural Nigeria.

1.4 Hypotheses of the Study

- i. Loan Tenure has no significant effect on Agricultural Productivity and Income of Smallholder Farmers in Rural Nigeria.
- ii. Loan Size has no significant effect on Agricultural Productivity and Income of Smallholder Farmers in Rural Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual Review

Microfinance

Generally, microfinance is conceived as an instrument for providing low-income people with access to various financial services, credit, savings, insurance, and financial literacy (Ledgerwood, 2019). The core logic of providing microfinance is based on ensuring financial inclusion and empowerment, which is premised on the assumption that providing microcredit and other forms of financial literacy to poor people can help them to make worthwhile investments in their activities, thereby escaping from the vicious cycle of poverty (Armendáriz & Morduch, 2010). From an agricultural perspective, microfinance is viewed as a powerful tool for transforming and linking smallholder farmers to capital, input, and technology

markets. From a theoretical perspective, providing microfinance to farmers is viewed as an instrument for improving their access to various production inputs such as fertilizers, seeds, and irrigation facilities, and for hiring labor, thereby enhancing their productivity (Kiplagat et al., 2020; Afolabi, 2021). The Agricultural Finance Theory argues that there is a positive link between credit availability, capital formation, and farm productivity, especially if credit is utilized efficiently (Binswanger & Sillers, 2018).

Globally, the literature on the impacts of microfinance and agricultural growth is varied. For the Asian region, some literature indicates robust positive impacts. For example, Khandker and Samad (2020) show that the establishment of microcredit institutions in Bangladesh was responsible for the increased investment and consumption stability in the agricultural sector for rural households. Similarly, access to microfinance services was shown to improve agricultural yields and the ability to cope with income shocks in the Indian context (Singh et al., 2021). However, critics caution that the impacts of microfinance may not be uniform for all regions and that it is not a “one-size-fits-all” approach. According to Dichter (2020), for instance, the use of high-interest microloans may not be aligned with the needs of the agricultural season and may thus contribute to debt levels for farmers. Others caution that the impacts of microcredit on agricultural productivity may be minimal in the absence of support services (Rahman & Khan, 2022).

Loan Tenure

The term “loan tenure” refers to the duration for which a borrower is expected to repay a given loan. The duration may be measured in terms of months or years. Loan tenure is a fundamental financial term that affects the structure of the loan repayment process and the level of interest that the borrower pays for the loans that they have acquired. It is particularly relevant in the context of cash flow management and affordability (Akinwunmi & Akinlo, 2019; World Bank, 2020).

Recent studies have emphasized that loan tenure is particularly relevant in the context of the economies of developing countries such as Nigeria, and that it is particularly affected by the unstable economic environment and the high level of interest present in the country (CBN, 2022; World Bank, 2020). In addition, flexible and well-structured loan tenures have been regarded as an essential factor for improving the level of accessibility and financial inclusion in the context of developing economies.

Loan Size

The term “loan size” refers to the amount of credit that is extended to farmers or agribusinesses for the purpose of production and/or processing activities. This factor is a key determinant of agricultural productivity because it has a direct effect on the level of production and the ability of the farmer to invest in the latest technology and techniques for the improvement of agricultural productivity. Empirical evidence suggests that the larger the loan size, the higher the chances for farmers to invest in quality seeds, fertilizers, irrigation systems, mechanization of farms, and hiring of labor, which may result in increased agricultural yields and income for the farmers. This is particularly true for those living in regions characterized by climate variability and market risks (Feder et al., 1990; World Bank, 2020).

However, the recent literature suggests that the effectiveness of loan size depends not only on the amount of the loan but also on the effective utilization of the credit extended to the farmers, the timing of loan disbursement, and the provision of support services such as extension services and market access. The literature suggests that in many developing countries such as Nigeria, prevailing high-interest rates and the need for collateral have led to a situation in which the loans extended to farmers are either too small or too late for effective investment in the production process (CBN, 2022; Nwankwo & Odigbo, 2021). There is also evidence that the larger the loans extended to farmers, the higher the chances of default risk. Thus, the optimal loan size for agricultural production is the level that matches the scale of agricultural activities and the needs of farmers and the relevant value chain for improving agricultural productivity and the well-being of those involved in the agricultural sector.

Agricultural Productivity

Productivity in agriculture refers to the volume of agricultural production realized by an individual farmer within a certain period of time. The inability of agriculture to grow and contribute meaningfully to the economy of Nigeria has been attributed to the non-provision of finance, which would lead to improvement through the provision of agricultural credits. It is worth noting that the problem of slow agricultural growth in Nigeria lies in the fact that attempts to achieve a broad economic basis for the rural population have been hampered by the lack of loanable financial resources. Among the reasons for the reduction in the share of agriculture in GDP is the absence of a credit policy for the country and credit organizations that could support the farmer (CBN, 2010). According to Raji (2008), agricultural finance is described as the process whereby resources are pooled together at all levels to ensure that there is increased productivity in the agricultural sector. The financing of agriculture in an emerging economy will have a positive effect on the development of the gross domestic product (GDP). Agricultural financing promotes growth while addressing issues associated with agricultural productivity and growth.

Agricultural Development

Agricultural development refers to a process aimed at improving agricultural productivity and sustainability to enhance food security, economic growth, and rural development. It encompasses various activities aimed at improving agricultural production through available resources and technology to increase agricultural output, such as crops, livestock, and other agricultural products, as well as challenges such as poverty, soil erosion, and market conditions (FAO, 2024). In agriculture, microcredit aims to relieve small-scale farmers from financial challenges, which enables them to access agricultural inputs such as fertilizers, quality seeds, and farm equipment (Tria et al., 2022; Imran et al., 2023). Agricultural development, understood as productivity per unit of input, is closely associated with access to capital and technology; where access to capital is limited, agricultural development becomes crucial, and is closely tied to access to agricultural credit aimed at improving agricultural output (Omowole et al., 2024; Ukpe & Saidu, 2023). Given that agriculture is an important component of rural development in Nigeria, smallholder farmers have a significant role in maintaining food security (Ukpe & Saidu, 2023). However, small-scale farmers' access to agricultural development through microcredit faces challenges such as defaulting, lack of financial literacy, and limited access to agricultural extension services (Babar et al., 2024; Nakano & Magezi, 2020).

2.2 Theoretical Frameworks

Financial Intermediation Theory

The theoretical basis of this study is Financial Intermediation Theory. According to this theory, financial intermediaries are instrumental in connecting the surplus units with deficit units in an economy. In the case of rural Nigeria, microfinance institutions act as significant financial intermediaries who make it possible for smallholder farmers to gain access to finances in order to increase their productivity and production levels. The central tenets of Financial Intermediation Theory have been developed largely by Gurley and Shaw (1960). In their pioneering work titled "Money in a Theory of Finance," they made important contributions to this field. Subsequently, other economists, including Douglas Diamond (1984), contributed to this theory, especially in aspects relating to liquidity transformation. This theory focuses on the importance of financial intermediaries such as microfinance banks in ensuring that money flows from people's savings to borrowers through these institutions. Microfinance institutions in rural Nigeria provide financing services to smallholder farmers who have no collateral and no credit history, allowing them to venture into agriculture and become more productive.

Regarding microfinance and smallholder farmers in rural Nigeria:

- i. Microfinance institutions act as financial intermediaries to smallholder farmers, offering loans to them as part of their services despite their inability to access financing through formal banking systems because of a lack of collateral and credit history.
- ii. These institutions help farmers access the capital needed for inputs, technology, and expansion, thereby enhancing productivity and income.
- iii. By managing information asymmetry and offering group lending models, microfinance institutions reduce risks and transaction costs, making financial services accessible and affordable for smallholders.

2.3 Empirical Review

The influence of the operation of microfinance on economic development and saving was investigated by Nwude and Anyalechi (2018) in Nigeria for the period of 2000 to 2015. The research was conducted through the application of ordinary least squares regression analysis. According to the results obtained from the study, microfinance bank operations have not helped in improving agricultural output in Nigeria; they have instead increased savings. The suggestions for improving the economic growth of Nigeria's rural areas include: the government making a conscious effort to improve basic infrastructure in the rural areas to encourage microfinance institutions to open up shop; microfinance institutions making an effort to lend money to those in the rural areas based on relationship lending; and diversification of some of the resources used in farming to reduce risks of farming due to extreme weather that might come as a result of climate change to improve productivity.

Gambo et al. (2026) carried out research on the impacts of agricultural credit schemes, which include commercial banks, microfinance banks, and cooperatives, on agricultural production, economic growth measured by GDP, and food security in Nigeria. After reviewing existing literature and analyzing major agricultural credit schemes in Nigeria, it becomes evident that agricultural credit has a significant impact on improving agricultural production and providing food security in Nigeria. There are problems associated with agricultural credit, such as high-interest rates, collateral, and lack of rural banking services that influence agricultural credit in Nigeria. Ways of tackling these problems have been recommended to enhance agricultural credit in Nigeria.

The effects of credit evaluation on rural farmers in Nigeria were studied by Ayegba and Ikani (2013). Data were collected using primary methods through a total sample size of 500 questionnaires. It was clear from the results that informal moneylenders (53.33%) constituted the major source of credit, which is harmful to an economy that is expected to develop. In addition, it was noted that there were no banks in the rural areas since most of them were found in urban settings.

The effect of credit given by commercial banks on agricultural production in Nigeria was researched by Udoka, Mbat, and Duke (2016). An ex post facto research design was adopted for this research. Data collection in this study was done from journal articles and the Statistical Bulletin of the Central Bank of Nigeria. The ordinary least squares technique was employed, and the results revealed that a significant positive relationship existed between the Agricultural Credit Guarantee Scheme and agricultural production in Nigeria. Consequently, secondary data extraction was used in this study.

3. METHODOLOGY

This study presents the methodological approach and procedures adopted in conducting the research. A descriptive survey research design was employed, as it is appropriate for generating quantitative data through standardized data collection procedures using structured research instruments and clearly defined study variables. In alignment with the focus of this study on smallholder farmers, the target population comprises smallholder farmers operating within selected regions of Nigeria. These regions were purposively chosen to ensure adequate representation of the diverse agricultural practices and socio-economic conditions of smallholder farmers across the country. The total population consisted of 869 identified

smallholder farmers within the selected regions. From this population, a sample size of 274 respondents was determined using the Taro Yamane formula, which is suitable for studies with a known and finite population. The respondents were selected using a random sampling technique to ensure representativeness and minimize sampling bias.

A properly structured and self-created questionnaire titled “Effect of Microfinance on the Productivity and Income of Small Farmers in Rural Nigeria” was used for obtaining the desired data from respondents. This questionnaire was divided into two sections, Section A and Section B. Section A was used to obtain data regarding the personal information of the respondent, whereas Section B consisted of questions posed to respondents with options such as SA, A, D, and SD. The required data was obtained through a questionnaire survey among the selected firms. In all, 274 copies of the questionnaire were distributed, and 274 copies were collected on the spot by the researcher. It is also necessary to note that 13 copies of the questionnaire were not completed properly and were discarded, meaning the researcher obtained 261 properly filled copies for analysis. Descriptive statistics such as frequency count and percentages were applied to the analysis of demographic characteristics and responses to research questions, while the inferential statistic, chi-square, was used for testing research hypotheses at a level of significance of 0.05.

4. RESULT ANALYSIS

Reliability

Reliability of the test instrument was measured through the use of Cronbach's Alpha. The value of 0.75 for the coefficient indicated that the test instrument was reliable.

Section A: Presentation of Demographic Information

TABLE 1. *Respondents' Distribution Based on Firms*

FIRM	POPULATION [SAMPLE]	PERCENTAGE (%)
Abenigo Agro Nig. Ltd.	248 [78]	28%
Agro Nurseries Limited	195 [61]	22%
Demmaco Optimum Services Ltd	63 [20]	07%
Difag Multi-Inputs Ltd	208 [66]	24%
EBSU Agri Business Ent. Ltd.	97 [31]	11%
Enugu State Graduate Farmers	58 [18]	06%
Total	869 [274]	100%

Source: Field Survey (2025).

Table 1 shows the distribution of respondents from the selected firms as follows: Abenigo Agro Nig. Ltd. 78 (28%), Agro Nurseries Limited 61 (22%), Demmaco Optimum Services Ltd 20 (07%), Difag Multi-Inputs Ltd 66 (24%), EBSU Agri Business Ent. Ltd 31 (11%), and Enugu State Graduate Farmers 18 (06%). Of the 274 surveys that were sent out, 261 were returned, giving the questionnaire a return rate of almost 95%.

TABLE 2. Presentation of Demographic Data

CHARACTERISTIC	FREQUENCY	PERCENTAGE
Gender		
Male	188	72%
Female	73	28%
Marital Status		
Single	164	63%
Married	93	36%
Divorced	04	01%
Age		
20–29 years	80	31%
30–39 years	96	37%
40–49 years	53	20%
>50 years	32	12%
Working Experience		
< 5 years	139	53%
5–10 years	63	24%
11–20 years	39	15%
>20 years	20	08%
Qualification of Respondents		
Bachelor's Degree	133	51%
Master's Degree	62	24%
PhD	21	08%
Professional Certificates	45	17%

Source: Field Survey (2025).

Table 2 presents the demographic data on the characteristics of the respondents. The vast majority of respondents are male, accounting for 188 people, or 72% of the sample. Regarding marital status, single individuals constitute the majority at 164 (63%), while 93 (36%) are married. As for the age distribution, the highest share of respondents are aged 30–39 (96 people, 37%), followed by those aged 20–29 (80 people, 31%). Older respondents are represented in lower shares: those aged 40–49 account for 53 people (20%), while those over 50 account for 32 people (12%). Regarding working experience, 139 respondents (53%) have less than 5 years of experience, 63 (24%) have 5–10 years, 39 (15%) have 11–20 years, and 20 (8%) have over 20 years.

Regarding educational qualification, respondents with bachelor's degrees form the largest group, at 133 respondents (51%), followed by those holding professional certificates, at 45 respondents (17%). Those with master's degrees form the next largest group at 62 respondents (24%), while those holding PhDs form the smallest group, at 21 respondents (8%). These results give significant insight into the composition of the respondents, with dominant factors including gender, marital status, age range, working experience, and educational attainment.

Exploratory Factor Analysis

Exploratory Factor Analysis (EFA) refers to a statistical tool utilized in determining the underlying structure of data by establishing relationship patterns among the variables. By using EFA, one acquires knowledge regarding the underlying constructs of one's data, leading to a more profound comprehension of the relationships among the variables, which may

be helpful in future research activities. According to the Chi-Square test for the KMO, the individual constructs of the variables are ready for factor analysis.

TABLE 3. *Chi-Square (KMO) Tests for Study Constructs*

CONSTRUCT	VALUE	DF	P
Farm Income	2.893	2	0.235
Asset Ownership	4.421	5	0.490
Agricultural Productivity and Income of Smallholder Farmers	4.421	5	0.490

Source: Researchers' Computation (2025).

TABLE 4. *Exploratory Factor Analysis — Factor Loadings*

VARIABLE	FACTOR 1	FACTOR 2	FACTOR 3	UNIQUENESS
APISF2	0.758			0.513
API2	0.730			0.467
API3	0.693			0.477
API4	0.681			0.589
API1	0.632			0.473
API5	0.581			0.685
API3	0.573			0.587
API4		1.008		0.002
API1		0.995		0.032
FII1			0.903	0.336
FII2			0.721	0.400
AOI3			0.552	0.650
AOI4				0.746

Source: Researchers' Computation (2025). Note: The applied rotation method is Promax.

Factor loadings from Table 4 shed light on how observed variables relate to the factors derived using factor analysis. For instance, variables with high factor loadings on Factor 1, such as 0.758, 0.730, 0.693, 0.681, 0.632, 0.581, and 0.573, have strong relations with Factor 1. Such high loadings imply the presence of a common theme or construct for Factor 1, based on which these observed variables are related to it.

In the case of Factor 2, variables with factor loadings of 1.008 and 0.995 have strong relationships with this factor. Factor loadings greater than 1 may imply that such variables have very strong correlations with Factor 2 compared with other variables whose loadings are less than 1.

Factor 3, which has factor loadings of 0.903, 0.721, and 0.552, represents a somewhat weaker but still relevant connection with the variables loaded on this factor. Although these values are slightly lower than those of Factors 1 and 2, there remains a meaningful connection between the variables, suggesting that Factor 3 represents a specialized aspect of the dataset.

TABLE 5. *Factor Characteristics*

FACTOR	EIGENVALUES	UNROT. SUMSQ. LOADINGS	UNROT. PROP. VAR.	UNROT. CUMULATIVE	ROT. SUMSQ. LOADINGS	ROT. PROP. VAR.	ROT. CUMULATIVE
Factor 1	4.516	4.060	0.312	0.312	3.195	0.246	0.246
Factor 2	1.964	1.710	0.132	0.444	2.118	0.163	0.409
Factor 3	1.608	1.276	0.098	0.542	1.731	0.133	0.542

Source: Researchers' Computation (2025).

Factor characteristics are depicted in Table 5. The present study identified three factors, which explain different amounts of variance in the dataset. Factor 1 was the most important, with the highest eigenvalue (4.516), indicating considerable explanatory power; the high correlation between variables loaded on Factor 1 reflects a common thread connecting them, crucial to understanding the general structure of the dataset. Factor 2, with the second-highest eigenvalue (1.964), is also essential to the analysis, though its role is less dominant than that of Factor 1. Factor 3 was the least significant factor, with the smallest eigenvalue (1.608); although the correlation between its variables is not as strong as in the other factors, a meaningful connection remains. Overall, Factor 1 accounted for the largest share of variance in the dataset, while Factors 2 and 3 explained other, smaller aspects of the variance.

Hypothesis Testing

TABLE 6. *Goodness of Fit Test*

VARIABLE	R-SQUARE	ADJUSTED R-SQUARE
Agricultural Productivity and Income of Smallholder Farmers	0.720	0.587

Source: Researchers' Computation (2025).

TABLE 7. *Hypotheses Testing Results*

HYPOTHESIS	PATH	BETA	STD. DEV	T STATISTIC	P-VALUE	2.5%	97.5%
H₀₁	Loan Tenure → Agricultural Productivity and Income of Smallholder Farmers	0.143	0.023	6.190	0.000	0.158	0.872
H₀₂	Loan Size → Agricultural Productivity and Income of Smallholder Farmers	0.409	0.102	4.001	0.025	0.492	0.812

Source: Researchers' Computation (2025).

The hypotheses stated above were tested to assess the significance of the results obtained. The tests examine the significance of the independent variables, loan tenure and loan size, on the agricultural productivity and income of smallholder farmers in rural Nigeria. From the results, both loan tenure and loan size are statistically significant, as indicated in Table 7 above.

At the 5% level of significance, loan tenure and loan size are statistically significant [$\beta_1 = 0.143$; $\beta_2 = 0.409$] with [p-value = 0.000; p-value = 0.025], respectively. This means that a one-unit change in loan tenure and loan size will bring about a corresponding increase in the agricultural productivity and income of smallholder farmers in rural Nigeria.

Furthermore, the coefficient of determination, represented by R-squared (R^2) and adjusted R-squared (adjusted R^2), is a statistical measure that indicates the goodness-of-fit of the regression model to the data. The R-squared value of 0.720 indicates that 72 percent of the variation in the dependent variable (agricultural productivity and income of smallholder farmers in rural Nigeria) can be accounted for by the independent variables (loan tenure and loan size). Hence, the regression model accounts for a large portion of the variation in the dependent variable.

On the other hand, the adjusted R-squared, at 0.587, accounts for the number of predictors used in the regression model and adjusts the R-squared accordingly. The adjusted R-squared penalizes the regression model if it includes variables that contribute little or nothing to predicting the dependent variable. This explains why the adjusted R-squared is slightly lower than the R-squared, suggesting that the regression model may include some predictors that make little or no contribution to the model. In sum, while the R-squared offers an optimistic view of the model's explanatory power, the adjusted R-squared offers a more conservative estimate of the same.

5. CONCLUSION

Based on the analysis above, it is clear that microfinance is an essential tool in boosting the agricultural production and earning capacity of small-scale farmers in rural areas of Nigeria. Both loan tenure and loan size have been identified as crucial factors for achieving success through microfinance schemes. First, loan tenure gives farmers the necessary period to focus on agricultural investment without the need for immediate repayment, allowing their production cycle to become effective. Second, a greater loan size helps farmers expand their activities, improve their working equipment, hire workers, and diversify their work, thus achieving higher yields and higher earnings.

Considering the results obtained, it can be concluded that microfinance programs that provide farmers with longer repayment terms and substantial loan amounts will produce better outcomes. This means that microfinance programs should be tailored to the agricultural conditions of the region and should aim for long-term results rather than focusing on small, short-term credits for meeting production goals. The study concluded that microfinance has a significant positive impact on the agricultural productivity and income of smallholder farmers in rural Nigeria.

6. RECOMMENDATIONS

Based on the findings of the study, which reveal that loan tenure significantly influences agricultural productivity and overall income of smallholder farmers in rural Nigeria, while loan size also shows a significant effect, the following recommendations are proposed:

- i. Microfinance organizations should consider providing loans with longer repayment periods to small-scale farmers. Such longer periods will give farmers the opportunity to plant their crops and pursue other agricultural ventures without being under pressure to repay loans within very short periods.
- ii. Microfinance organizations need to reconsider increasing the limit of loans that can be provided to small-scale farmers. This is because larger amounts of money can help them purchase good-quality inputs like seeds and fertilizer, which will help boost production.

DECLARATIONS

Author Contributions (Credit): The authors are credited with the general writing of the work

Funding: This research received no external funding

Conflict of Interest: The authors declare no conflict of interest.

Ethics Approval: Not applicable

Consent to Participate: Informed consent was obtained from all individual participants included in the study.

Data Availability Statement: The data supporting the findings of this study were collected via a structured questionnaire administered to smallholder farmers in the selected regions and are available from the corresponding author upon reasonable request.

REFERENCES

- ❖ Adeniran, A., & Yusuf, T. (2019). Informal finance and rural agribusiness in Nigeria: Bridging access to credit gaps. *Journal of Development Finance Studies*, 6(2), 45–59.
- ❖ Adeoti, J., Ogunleye, A., & Ojo, F. (2023). Microfinance as a vehicle for enhancing smallholder farmers' productivity in Southwest Nigeria. *African Journal of Agricultural Economics and Development*, 12(1), 33–50.
- ❖ Afolabi, M. (2021). Microfinance and poverty reduction among smallholder farmers in rural Nigeria. *International Journal of Social and Economic Research*, 9(4), 149–167.
- ❖ Armendáriz, B., & Morduch, J. (2010). *The economics of microfinance* (2nd ed.). MIT Press.
- ❖ Ayegba, O., & Ikani, D. I. (2013). An impact assessment of agricultural credit on rural farmers in Nigeria. *Research Journal of Finance and Accounting*, 4(5), 1697–2222.
- ❖ Babar, M. A., Babar, M. M., Lehri, S. M., Arif, M., Hanif, M., Ullah, N., Ali, M. B., & Ashraf, M. (2024). Impact of microfinance on agriculture sector development, SMEs and small entrepreneurs: A literature review. *Spry Contemporary Educational Practices*, 3(1), 842–854. <https://doi.org/10.62681/sprypublishers.scep/3/1/45>
- ❖ Banerjee, A. V., & Duflo, E. (2019). *Good economics for hard times*. Public Affairs.
- ❖ Becivenga, V. R., & Smith, B. D. (1991). Financial intermediation and endogenous growth. *Review of Economic Studies*, 58(4), 195–209.
- ❖ Binswanger, H., & Sillers, D. (2018). Rural credit and agricultural development: Conceptual frameworks revisited. *Agricultural Finance Review*, 78(3), 245–264.
- ❖ Central Bank of Nigeria (CBN). (2005). *Statistical bulletin* (Vol. 16). CBN.
- ❖ Central Bank of Nigeria (CBN). (2020). *Revised microfinance policy, regulatory, and supervisory framework for Nigeria*. CBN.
- ❖ Deere, C. D., & Doss, C. R. (2021). Gender and the distribution of wealth in developing countries. *Development and Change*, 52(1), 3–33.
- ❖ Dichter, T. (2020). Beyond the hype: Assessing microfinance impacts two decades later. *World Development*, 136, 105–119.
- ❖ Enhancing Financial Innovation & Access (EFInA). (2022). *Access to financial services in Nigeria 2022 survey*. EFInA.
- ❖ Ezeanyejì, C., Okoli, N., & Nnamdi, N. (2023). Microfinance participation and welfare outcomes among rural households: Evidence from Nigeria. *Review of African Political Economy*, 50(175), 98–115.
- ❖ FAO. (2021). *State of food and agriculture in Nigeria: Transforming food systems for inclusive rural growth*. FAO.
- ❖ Food and Agriculture Organization (FAO). (2024). 33.1 million Nigerians projected to be food insecure in 2025. FAO in Nigeria.
- ❖ Gambo, Z., Zakari, F. S., Zulaiha, J. B., Aisha, K. A., Hauwa'u, Y. D., & Sulaiman, A. D. (2026). Impact of agricultural financing on economic performance and food security: Evidence from Nigeria. *IARD International Journal of Banking and Finance Research*, 12(1).
- ❖ Imran, M., Haq, S. U., & Phambra, A. M. (2023). Smallholder farmers' access to microcredit and energy efficiency in crop production (pp. 1–16). https://doi.org/10.1007/978-981-19-7736-7_37-1
- ❖ Khandker, S. R., & Samad, H. (2020). Dynamic impacts of microfinance on rural poverty and production in Bangladesh. *World Bank Economic Review*, 34(1), 27–52.
- ❖ Kiplagat, P., Korir, J., & Chumo, C. (2020). The role of microfinance institutions in agricultural development: Lessons for Sub-Saharan Africa. *Journal of Rural & Community Development*, 15(3), 25–40.
- ❖ Ledgerwood, J. (2019). *Microfinance handbook: An institutional and financial perspective* (3rd ed.). World Bank Group.
- ❖ Mazzucato, M. (2018). *The value of everything: Making and taking in the global economy*. Allen Lane.
- ❖ McKinnon, R. (1973). *Money and capital in economic development*. Brookings Institution.
- ❖ Nakano, Y., & Magezi, E. F. (2020). The impact of microcredit on agricultural technology adoption and productivity: Evidence from a randomized control trial in Tanzania. *World Development*, 133, 104997. <https://doi.org/10.1016/j.worlddev.2020.104997>
- ❖ National Bureau of Statistics (NBS). (2022). *Annual abstract of statistics 2022*. NBS.
- ❖ Nosiru, M. O. (2010). Microcredits and agricultural productivity in Ogun State, Nigeria. *World Journal of Agriculture Science*, 6(3), 290–296.

- ❖ Nwankwo, O. (2012). Agricultural financing in Nigeria: An empirical study of Nigerian Agricultural and Rural Development Bank (NACRDB): 1990–2010. *Journal of Management Research*, 5(2), 28–44.
- ❖ Nwosu, S., & Ogu, C. (2021). Assessing the growth impacts of rural microfinance in Nigeria: Insights from panel data. *Journal of Development Studies and Policy*, 8(2), 79–95.
- ❖ Nwude, E. C., & Anyalechi, K. C. (2018). The impact of microfinance on rural economic growth: The Nigerian experience. *International Journal of Economics and Financial Issues*, 8(4), 27–31.
- ❖ Okonkwo, I., & Agu, G. (2022). Credit accessibility and agricultural income among smallholders: Evidence from Anambra State, Nigeria. *Nigerian Journal of Agricultural Economics*, 13(2), 112–128.
- ❖ Omowole, B. M., Urefe, O., Mokogwu, C., & Ewim, S. E. (2024). Integrating fintech and innovation in microfinance: Transforming credit accessibility for small businesses. *International Journal of Frontline Research and Reviews*, 3(1), 090–100. <https://doi.org/10.56355/ijfr.2024.3.1.0032>
- ❖ Ozor, N., Adesope, O., & Emenyonu, C. (2022). Microcredit and adoption of improved agricultural technologies among rural farmers in Nigeria. *Journal of Agricultural Extension and Rural Development*, 14(4), 203–215.
- ❖ Piketty, T. (2014). *Capital in the twenty-first century*. Harvard University Press.
- ❖ Poliquit, L. Y. (2006). *Accessibility of rural credit among small farmers in the Philippines* [Master's thesis, Massey University].
- ❖ Rahman, S., & Khan, M. A. (2022). Microfinance and smallholder resilience: A meta-analysis of agrarian impacts in Asia and Africa. *Development Policy Review*, 40(S1), e12645.
- ❖ Rhaji, M. A. (2008). An analysis of the determinants of agricultural credit approval/loan size by commercial banks in south-western Nigeria. *Nigeria Agricultural Development Studies*, 1(1), 17–26.
- ❖ Shaw, E. (1973). *Financial deepening in economic development*. Oxford University Press.
- ❖ Singh, R., Verma, A., & Gupta, A. (2021). Microfinance, agricultural productivity, and rural resilience: Evidence from India's self-help groups. *Journal of Rural Studies*, 82, 413–423.
- ❖ Tria, D., Harun, M., & Alam, M. (2022). Microcredit as a strategy for employment creation: A systematic review of literature. *Cogent Economics & Finance*, 10(1). <https://doi.org/10.1080/23322039.2022.2060552>
- ❖ Udoka, C. O., Mbat, D. O., & Duke, S. B. (2016). The effect of commercial banks' credit on agricultural production in Nigeria. *Journal of Financial Accounting*, 4(4), 1–10. <https://doi.org/10.12691/jfa-4-1-1>
- ❖ Ukpe, U. H., & Saidu, D. M. (2023). Evaluating the role of credit facilities as drivers of small-scale rice farmers' productivity in Wukari Local Government Area, Taraba State, Nigeria. *International Journal of Sustainable Agricultural Research*, 10(4), 109–119. <https://doi.org/10.18488/ijisar.v10i4.3575>
- ❖ World Bank. (2020). *World development report 2020*. World Bank.
- ❖ World Bank. (2023). *Nigeria economic update: Seizing agribusiness opportunities*. World Bank.