IMPACT OF MICROFINANCE BANKING SERVICES ON THE PERFORMANCE OF SMALLHOLDER RICE FARMERS IN KADUNA STATE, NIGERIA

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ABSTRACT
This study analyzes the impact of microfinance banking services on the performance of smallholder rice farmers in Kaduna State, Nigeria. Despite Nigeria's significant agricultural potential, smallholder farmers face multiple challenges, such as limited access to credit, insufficient infrastructure, and inadequate training, which hinder productivity. Microfinance institutions offer financial products like loans and savings, which are expected to enable farmers to invest in essential inputs and training, potentially boosting performance. The research employed a cross-sectional survey design and used primary data collected through a well-structured questionnaire administered to farmers organized into cooperatives. Stratified and simple random sampling techniques were used to select 179 respondents from three local government areas known for rice production. The data were analyzed using multiple regressions to test the relationship between microfinance services and farmers' performance. The findings reveal that microcredit and entrepreneurial skills training had significant positive impacts on farm performance at 1% level of probability which implies a unit increase in these variables will increase farmers' performance, while micro-savings had a negative effect at 1% level of probability and this decreases farmers' performance with a unit increase. The study shows that access to larger amounts of credit and enhanced entrepreneurial training can improve farmers' productivity and income, whereas improved savings programs are needed to foster financial discipline among farmers. It was recommended that government and financial institutions work together to enhance access to microfinance services, particularly in rural areas. Government should design policies to reduce barriers such as high interest rates and long repayment periods.

Key words: Microfinance, Banking, Rice, Farmers, Kaduna.
JEL Classification Codes: Q10, G21

1. INTRODUCTION
Nigeria is among the few countries in the world characterized by contradictory socio-economic and development scenarios. Despite its enviable human and material resources, the country and its people are classified among the very poor (Okunmadewa, 2021; UNDP, 2020), with no fewer than 4% of Nigerians living below the poverty line. It is described as a nation with a complex socio-political history that has largely impacted the population adversely, leading to worsening income distribution and increased poverty (Salamatu, 2023).

The country boasts of vast agricultural potential, with smallholder farmers constituting a substantial part of the agricultural workforce. However, these farmers are faced with barriers such as limited access to credit, inadequate training, and poor infrastructure, which hinder their productivity and income generation (Ogunlela&Mukhtar, 2023; Ibrahim &Mansor, 2022). Microfinance Institutions (MFIs) have emerged as important players in addressing these

challenges by providing financial services to smallholder farmers. These institutions offer microloans, savings options, and other financial products that enable farmers to invest in agricultural inputs, technology, and training. Previous research indicates that access to microfinance has led to improved productivity and income stability for smallholder farmers (Krah&Akpan, 2023).

While microfinance institutions have been heralded as key tools for alleviating poverty, their use may have detrimental consequences for the global poor. Repaying loans granted by microfinance institutions (MFIs) without understanding borrowers' situations can exacerbate their poverty and suffering. Smallholder farmers continuously seek to leverage available financial instruments to enhance their performance and secure the best possible investment choices.Despite the potential benefits, the effectiveness of microfinance banks in improving the performance of smallholder farmers in Kaduna State is not without challenges. High-interest rates, a lack of financial literacy, and the risk of over-indebtedness pose significant hurdles (Ogunbiyi& Adebayo, 2022). Additionally, studies have shown conflicting results regarding the impact of microfinance on agricultural productivity. Some researchers argue that microfinance may exacerbate poverty if not managed correctly (Diagne& Zeller, 2001).In recent years, the Nigerian government has recognized the importance of microfinance in agricultural development and has implemented various policies to enhance the sector. The initiatives of the Central Bank of Nigeria aim to promote microfinance institutions and provide a more conducive environment for smallholder farmers to access financial services (Central Bank of Nigeria, 2023). However, further research is needed to assess the actual impact of these initiatives on the performance of smallholder farmers in Kaduna State.

Moreover, research aimed at establishing the relationship between microfinance and farmer performance has yielded conflicting results. While Nasiru (2021), Tanko, Ajani, and Adeniji (2023), Girabi and Mwakaje (2023), and Nzomo and Muturi (2023) reported positive relationships, others, such as Hulme and Mosley (2013), Diagne and Zeller (2021), and Karnani (2007), found that microfinance services have a negative impact on farmer performance. Indeed, Hulme and Mosley (2013) found a positive and significant impact of microcredit for larger farmers with existing resources, income, and physical assets, while the impact was negative for smaller farmers. This discrepancy underscores the need for further research to investigate the direct relationship between these variables.The main objective of this study is to determine the impact of microfinance banks on the performance of small farmers in Kaduna State.

The study is structured to provide a comprehensive analysis of the influence of microfinance services on smallholder rice farmers' performance in Kaduna State, Nigeria. Each section is organized logically, moving from theoretical foundations to empirical investigation. Introduction: This section presents the research problem, objectives, and the significance of microfinance in enhancing smallholder rice farmers' productivity in Nigeria. Literature Review and Theoretical Framework: This section examines previous studies on the impact of microfinance services and discusses relevant theories, including Classic Microfinance Theory and Human Capital Theory, to establish the conceptual foundation of the study. Methodology: This section outlines the research design, sampling methods, and data collection approach (using a structured questionnaire). It also explains the rationale for using multiple regression analysis to test the study's hypotheses. Results and Discussion: This section presents findings from the regression analysis, discussing the effects of microfinance services on farmers' performance in relation to previous research. Conclusion and Recommendations: This final section summarizes key findings and offers recommendations.

2. LITERATURE REVIEW

2. 1 Theoretical Literature

This study has two theoretical underpinning which are: Classic microfinance theory andHuman Capital Theory.

a. Classic Microfinance Theory

Classic Microfinance Theory, as articulated by Srikant, Marc, and Kristi (2008) and cited by Dunford (2022), posits that individuals living in poverty can access microfinance services, such as loans or savings, to initiate or expand micro-enterprises. This financial support enables them to generate sufficient net revenue to repay loans with interest while also increasing their household income and overall standard of living. Key assumptions of this theory include: (1) clients utilize microfinance institutions for loans or savings; (2) they invest these funds in viable businesses; and (3) they manage these enterprises to achieve significant returns on investment. Proponents of this theory argue that microfinance institutions are vital for addressing the lack of financial services, particularly in rural areas, and those small loans and savings promote economic self-sufficiency, thereby enhancing beneficiaries' performance.

The implication of this theory for this study is that smallholder farmers who engage with microfinance services (such as microcredit and micro-savings) can improve their agricultural performance. The Classic Microfinance Theory is particularly relevant, as it suggests that low-income farmers can utilize microfinance products to invest in their farms, ultimately leading to improved productivity and income.

Challenges and Critiques

Despite its widespread adoption, microfinance has faced criticism and scrutiny. Several studies indicate that microcredit does not uniformly lead to poverty reduction or sustainable income generation. Bateman (2010) argues that microfinance can create dependency rather than fostering economic independence, especially when borrowers lack the business skills necessary to invest funds effectively. Kabeer (2005) adds that while microfinance can empower certain individuals, others may fall into debt traps, especially in cases where they face economic shocks or rely on high-interest loans. Such critiques raise questions about the assumption that all recipients will manage funds optimally and repay loans.

b. Human Capital Theory

Human Capital Theory, developed by Becker (1975), posits that knowledge and experience are essential resources that individuals possess and that inform their ability to recognize and exploit opportunities (Chandler & Hanks, 2000). This theory underscores the significance of education and experience in entrepreneurial development and the enhancement of entrepreneurial activities. The implication of Human Capital Theory for this study is that as farmers acquire entrepreneurial skills through education and experience gained from microfinance banks—their enhanced knowledge can lead to increased entrepreneurial activities, ultimately improving their overall performance.

Critiques and Limitations

While Human Capital Theory underscores the importance of skills for productivity, it has limitations, particularly in contexts with structural barriers. For instance, Schultz (1961) and recent studies argue that skills and knowledge alone may not lead to higher productivity if farmers lack access to markets, modern inputs, or supportive infrastructure. Additionally, Duflo*et al.* (2008) indicate that the benefits of skills training are often mediated by factors such as access to capital, the suitability of the training for local needs, and environmental conditions. These critiques highlight that human capital development, while necessary, may be insufficient for substantial improvement in agricultural performance without other supportive factors.

2.2 Review of Empirical Studies on Microfinance and Performance

This section reviews empirical studies on the impact of microfinance on smallholder rice farmers' performance, focusing on three key independent variables: microcredit, micro-

savings, and entrepreneurial skills training. The review aims to highlight the contributions and limitations of existing studies to provide context for the current study's investigation.

a. Microcredit and Performance

Udoka, Mbat, and Duke (2016) explored the impact of commercial bank credit on agricultural output in Nigeria, using secondary data from published articles and the Central Bank of Nigeria's Statistical Bulletin. Their findings, derived from an ex-post facto research design and ordinary least squares regression, revealed a positive relationship between the Agricultural Credit Guarantee Scheme Fund and agricultural production. However, the study's reliance on secondary data limited the ability to capture firsthand insights from farmers, which may have provided a deeper understanding of credit usage and its impact on performance.

Ayegba and Ikani (2019) assessed the effects of agricultural credit on rural farmers, collecting primary data through 500 questionnaires. Their study found that unregulated private money lenders were the predominant source of credit (53.33%), which negatively impacted economic growth. They also noted that the scarcity of formal banking services in rural areas restricted farmers' access to regulated credit sources, hindering their productivity. This study recommended closer collaboration between the government and banks to design financial instruments tailored to the agricultural sector's cash flow and risk patterns.

Poliquit (2020) focused on the accessibility of rural credit for small farmers in the Philippines. The study employed interviews with 45 farmers and 4 local informants, revealing significant barriers to accessing formal credit. Farmers' needs for credit were largely unmet, and the study suggested the introduction of innovative financing schemes to improve credit accessibility. This aligns with the broader critique that traditional credit systems are insufficient in addressing the unique challenges faced by rural farmers.

b. Micro-savings and Performance

Ikechukwu (2006) investigated the savings and investment behaviors of farmers in Giwa and SabonGari Local Government Areas, Nigeria. Using a sample of 160 randomly selected farmers and employing descriptive statistics, multiple regression, and correlation analysis, the study found that factors such as farm income, off-farm income, and family size explained a significant portion of savings and investment behaviors (61% and 71%, respectively). This finding underscores the importance of financial stability and additional income sources in influencing farmers' ability to save and invest in their agricultural enterprises.

Babajide, Taiwo, and Isibor (2015) examined micro-savings mobilization innovations in Lagos and Ogun States, Nigeria. They analyzed primary data from 267 respondents through structured questionnaires and found that the introduction of innovative savings products led to a 160% increase in savings rates. The study highlighted the potential of innovative savings products to encourage rural savings, providing a pathway to poverty alleviation. However, the need for greater awareness and access to these savings products was emphasized to increase their impact.

Minimbo (2013) analyzed the relationship between microcredit and maize productivity in Tanzania, using village savings loans. The study found that access to microcredit through savings schemes had a positive impact on farmers' productivity, confirming the beneficial role of micro-savings in improving crop yields. This study emphasizes the importance of accessible financial products for enhancing smallholder productivity.

c. Entrepreneurial Skills Training and Performance

Noor and Dola (2011) evaluated the impact of training on farmers' perceptions and performance. The study involved 323 farmers and training personnel, and employed a multi-stage data collection approach, including mail surveys, telephone surveys, and face-to-face interviews. The results indicated a positive trend in the effectiveness of training programs. However, variations in the benefits of training were noted, suggesting that factors such as the quality of training and the specific skills imparted played a role in determining its success.

Wordofa and Sassi (2016) assessed the role of Farmer Training Centers (FTCs) in improving income and productivity among small farmers in Ethiopia. Based on a household survey of 250 households, the study demonstrated a significant positive effect of FTC-based training on farm productivity and income. The results highlight the importance of accessible and effective training programs in enhancing smallholder farmers' entrepreneurial capabilities, ultimately improving their performance.

Santoyorio (2013) conducted a training needs assessment for the Project for Agricultural Development and Economic Empowerment (PADEE) in Cambodia. The study employed both qualitative and quantitative research methods to identify farmers' training needs across various agricultural practices. Findings revealed a strong demand for training in livestock and crop production, with pest and disease control being of particular interest. This study emphasizes the critical role that targeted training programs can play in addressing farmers' needs and improving agricultural outcomes.

2.3 Literature Gap and Value Addition

While there is substantial literature on the impact of microfinance on agricultural productivity and poverty reduction in general, few studies focus specifically on smallholder rice farmers in Kaduna State, Nigeria. Existing studies on microfinance in Nigeria tend to focus on broader agricultural contexts or urban areas, while research specifically addressing the intersection of microfinance services (like microcredit, micro-savings, and entrepreneurial skills training) and smallholder farmers in Northern Nigeria is limited. This study fills this gap by targeting the performance of rice farmers who benefit from these microfinance services in Kaduna State. Many studies have focused on either microcredit or micro-savings but not both, and fewer still examine the combined effect of microcredit, micro-savings, and entrepreneurial skills training on agricultural performance. This study is unique in its simultaneous consideration of these three factors and their influence on smallholder rice farmers, filling a gap in empirical literature on the cumulative impact of these services on agricultural outcomes.

3. METHODOLOGY

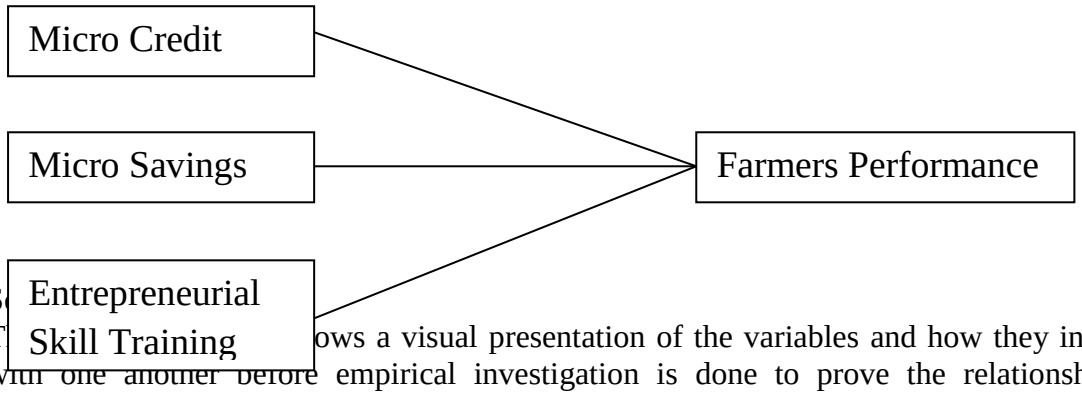
The study was conducted in Kaduna State, located in Nigeria's North-West region, covering an area of approximately 48,473.3 km². The state comprises 23 Local Government Areas (LGAs), with the capital city being Kaduna. Geographically, it lies between latitudes 11° 32' and 09° 02' N and longitudes 08° 50' and 06° 15' E, bordered by Zamfara, Katsina, Kano, Niger, Bauchi, Plateau, and the Federal Capital Territory. The state has a population of approximately 8.85 million as of 2018. Its climate is tropical continental, with distinct wet and dry seasons and annual rainfall ranging from 1,016 mm to 1,524 mm, and an average temperature of 25.2°C.

Primary source of information was used to collect data from individual farmers registered with cooperatives that are associated with Microfinance Institutions (MFIs) using a well-structured questionnaire. Using a multi-stage sampling technique, 179 rice farmers were selected for the study.

3.1 Theoretical Framework

The Classic Microfinance Theory suggests that microfinance services such as microcredit, micro-savings, and entrepreneurial training play a crucial role in enhancing the performance of smallholder farmers by providing financial resources and improving their financial management skills. Meanwhile, Human Capital Theory emphasizes the importance of developing the skills and knowledge of farmers through training and education, which can further enhance their ability to manage their agricultural enterprises effectively. Together, these two theories form the foundation of the study, where the relationship between microfinance services (microcredit, micro-savings, and entrepreneurial skill training) and smallholder rice farmers' performance is explored. These theoretical perspectives guide the investigation into how these services contribute to improving productivity and income for smallholder farmers in Kaduna State.

Figure 1: Research Framework



S
T ows a visual presentation of the variables and how they interrelate with one another before empirical investigation is done to prove the relationship. The independent variables (microcredit, micro-savings, and entrepreneurial skill training) are expected to influence the performance of small farmers which is the dependent variable.

3.2 Model Specification

The data for this study were analyzed using multiple regression analysis to test the hypotheses regarding the effect of microfinance services on smallholder rice farmers' performance in Kaduna State. The decision to employ regression analysis as a parametric tool was based on the researcher's objective to establish the relationship between the variables and to identify which variables predict the dependent variable, as well as their influence on this prediction. Regression analysis aims to investigate which independent variables predict the dependent variable and their respective influences on that prediction.

Farmers' performance (FP) was be regressed on microcredit (MC), micro-savings (MS), and entrepreneurship skills (ES). Consequently, the combined effect of the three independent variables microcredit, micro-savings, and entrepreneurial training skills on the dependent variable (small farmers' performance) will be determined through multiple regression analysis. Thus, the model

$FP = \alpha + ß1\text{MCi} + ß2\text{MSi} + ß3\text{ESi} + \varepsilon$

Where, FP = Farmers' performance which was measured by yield. α =Constant term representing the intercept of the model; MC = Microcredit which is the financial credit provided to smallholder farmers; MS =Micro-savings representing the savings deposited by farmers with microfinance institutions; ES=Entrepreneurial skill training, covering the training provided to farmers to enhance their business and management skills; β1- β3 = Coefficients of the respective independent variables, indicating the effect size and direction of each variable's impact on farmers' performance; ε = Error term

4. RESULTS AND DISCUSSION

The data went through series of preliminary analysis before presented. The data collected were screened for missing values, data screening and outliers. Also, the assumptions of linear regression like normality, linearity, multicollinearity, homoscedasticity and test for auto correlation were carried out before the test of hypothesis.

Table 2: Regression Output 1: ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	29.435	3	9.812	13.952	0.000[b]
Residual	123.073	175	0.703		
Total	152.508	178			

a. Dependent Variable: FPnb. Predictors: (Constant), ESn, MSn, MCn

Source: SPSS Output, 2024

The results on table 2 show that the combined effects of microcredit, micro-savings, and entrepreneurial skill training significantly influence the performance of smallholder rice farmers in Kaduna State. The significant F-statistic (13.952) and low significance value (0.000)

indicate that the regression model as a whole is a good fit for the data, and the independent variables can explain a substantial amount of variance in rice farmers' performance.Similar studies, such as those by Robinson (2001) and Roodman&Morduch (2014), have shown that access to microcredit enables smallholder farmers to invest in inputs, technologies, and other resources that lead to increased productivity.

Table 3: Regression Output 2: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std Error of the estimate	Durbin Watson
1	0.439[a]	0.193	0.179	0.83861	1.925

a. Predictors: (Constant), ESn, MSn, MCn.
b. Dependent Variable: FPn

Source: SPSS Output, 2024

Table 3 shows the summary of the multiple regression analysis. The empirical findings show that R, the multiple correlation coefficient stood at 0.439 which indicates a moderate correlation. R^2, the multiple coefficient of determination of the variables stood at 0.193 indicating that about 19.3% of the total variation in FP is explained by variations in the, independent variables captured in the study. The adjusted R^2 being 0.179 also indicates that the independent variables will still explain 17.7% of the variations in FP even if other variables were added to the study.

Table 4: Multiple Regression Estimates

Coefficients[a]							
	Unstandarized Coefficient		Standarized Coefficient			Collinearity Statistics	
Model	B	Std Error	Beta	T	Sig	Tolerance	VIF
Constant	3.242	0.315		10.299	0.000		
MCn	0.177	0.067	0.191	2.655	0.009	0.892	1.121
MSn	-0.270	0.058	-0.318	-4.66	0.000	0.990	1.010
ESn	0.191	0.066	0.206	2.885	0.004	0.901	1.110

a. **Dependent Variable: FPn**

Source: SPSS Output, 2024

Table 4 presents the results of the multiple regression analysis, detailing the coefficients for the independent variables (microcredit, micro-savings, and entrepreneurial skill training) and their impact on the dependent variable (farmers' performance, FPn) The coefficient of microcredit (0.177) indicates that for each one-unit increase in microcredit, farmers' performance is expected to increase by 0.177 units, holding other variables constant. This result agrees with the findings of Khandker, (2005) on Microfinance and Poverty using panel data from Bangladesh. This implies that microcredit has a positive impact on farmers' performance, and the effect is statistically significant at 1% level of probability. Moreover the micro-savings coefficient (-0.270) indicates that an increase in micro-savings is associated with a decrease in farmers' performance by 0.270 units, which is statistically significant at 1%. This negative relationship could suggest that increased savings may not directly contribute to perform and could possibly indicate issues such as liquidity constraints or a lack of effective utilization of saved funds. This in conformity with the findings of Duvendack*et al.*,(2011)

Lastly, entrepreneurial skill trainingcoefficient (0.191) shows that for each unit increase in entrepreneurial skill training, farmers' performance is expected to increase by 0.191 units, holding other variables constant. This effect is also statistically significant at 1%, indicating

that entrepreneurial skill training positively influences farmers' performance. This consistent with result of Adebayo *et al.*,(2015) in their study on impact of entrepreneurial training on the performance of smallholder farmers in Nigeria.

5. CONCLUSION AND POLICY RECOMMENDATIONS

In conclusion, the study aimed to analyze the impact of microfinance institutions on smallholder rice farmers' performance in Kaduna State, focusing on three critical microfinance components: microcredit, micro-savings, and entrepreneurial skills training. The multiple regression analysis revealed that microcredit and entrepreneurial skills training had a significant positive impact on smallholder farmers' performance, while micro-savings showed a negative but statistically significant effect. These findings implies that access to credit and relevant entrepreneurial training can improve agricultural productivity and income, supporting the notion that microfinance is a valuable tool for enhancing rural farmers' economic conditions.

The negative impact of micro-savings, however, implies a complex relationship between savings behaviour and performance, which may be influenced by various socio-economic factors, such as the limited financial capacity of farmers to save while investing in their farming enterprise. These findings align with previous research, such as that of Nasiru (2021); Ayegbaand Ikani (2019), which underscores the role of financial inclusion in rural development Based on the findings of the study, it was recommended that government and financial institutions work together to enhance access to microfinance services, particularly in rural areas. Government should design policies to reduce barriers such as high interest rates, long repayment periods, and collateral requirements, which hinder smallholder farmers from fully benefiting from microfinance services.Additionally, microfinance banks should foster a culture of saving among farmers. This should not be limited to voluntary cooperative group savings, but should include innovative programs and schemes that incentivize small farmers to save more effectively.Furthermore, financial institutions that provide services to farmers should intensify their efforts in educating and enlightening them on entrepreneurial skills. This would significantly contribute to transforming subsistence farming in Nigeria into a more business-oriented venture, promoting sustainability and profitability within the agricultural sector.

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