

Impact of Microcredit on Income Levels and Income-Generating Activities among Small-Scale Farmers in Rural Southeast Nigeria

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Abstract

This study examined the impact of microcredit on income levels and income-generating activities among small-scale farmers in rural Southeast Nigeria. Employing a cross-sectional survey design, 360 households were sampled, comprising 180 microcredit beneficiaries (treated households) and 180 non-beneficiaries (comparison households), across Abia, Imo, and Anambra States. Households were identified using datasets provided by microfinance banks operating in the region, with propensity score matching applied to ensure comparability between the two groups. Primary data were collected using structured questionnaires and analysed using ordinary least squares regression and mean-score analysis. Findings from the Cobb-Douglas regression model indicated that microcredit use was positive and highly significant in the pooled model ($\beta = 1.329$, $p < 0.01$), confirming that access to microcredit increased income levels. Other significant positive determinants of income among treated households included farming experience, household size, level of education, farm size, cooperative membership, quantity of agrochemicals, and quality of planting materials, while age and labour cost had negative effects. Mean-score analysis revealed that treated households reported significantly stronger positive experiences across all ten income-generating activity indicators compared with comparison households, with all differences statistically significant at the one percent level (grand mean: treated = 4.14, comparison = 2.97). The study recommends expanding and better structuring microcredit programmes to promote productive farm investments and financial literacy among small-scale farmers in rural Southeast Nigeria.

Keywords: Microcredit, Income Level, Credit Utilisation, Small-Scale Farmers, Smallholder Agriculture, Rural Livelihoods.

Introduction

Agriculture is one of the main pillars of Nigeria's economy and employs close to seventy percent of the labour force. It also provides most of the food that Nigerians consume (Udemezue, 2018). However, the yields of important crops like cassava, yam, maize, and rice have remained low and, in some cases, have continued to fall (Ume & Ogbonna, 2022). Small-scale farmers work on most of the farmland in the country and produce about eighty percent of the total food supply. Sadly, only about four percent of these farmers have access to formal credit (Ume & Ogbonna, 2022). This lack of credit limits their ability to buy good

inputs, adopt improved technologies, or expand their farms. As a result, growth and modernisation in the sector have been very slow (Okon *et al.*, 2017). The problem has contributed to high levels of food insecurity. Recent data from the Food and Agriculture Organization show that more than 25 million Nigerians faced food insecurity even during the 2024 harvest season (FAO, 2024).

Many rural development programmes have introduced microcredit to reduce financial barriers for small farmers. Microcredit refers to small loans that are often given without strict collateral requirements. They are usually designed for low-income people who cannot access loans from traditional banks. In agriculture, microcredit helps farmers to buy inputs such as fertilisers, improved seeds, and small farm machines. It also helps them to manage cash flow, especially during periods when farm income is low (Okon *et al.*, 2017). The idea behind this form of credit is simple: when farmers get small loans, they can make investments that increase productivity, income, and the stability of their livelihoods. Studies in Nigeria and other developing countries show that access to microcredit can improve productivity and income. However, the level of success often depends on factors like the amount of the loan, repayment terms, training, and how strong the lending institution is (Olumilua *et al.*, 2024; Ogbonna *et al.*, 2025).

Statement of the Problem

In Southeast Nigeria, farming is mostly small-scale and subsistence-based. Most farmers grow cassava, yam, and maize on small and scattered plots of land. They depend on rainfall for production and face high production costs. Field reports show that they also deal with problems like insecurity, changing weather patterns, and limited access to credit (Abojei *et al.*, 2025). One recent study noted that it is more difficult for farmers in the South-East to access loans from institutions such as the Bank of Agriculture compared to other parts of the country (Ettah *et al.*, 2022). These challenges make small-scale farming riskier in this region and reduce the ability of farmers to invest or diversify their income. This situation makes it necessary to improve access to credit, rural infrastructure, and extension services to strengthen productivity and rural resilience (Okon *et al.*, 2017).

Even though microcredit seems to hold promise, very few studies have focused on its effects in Southeast Nigeria. Most of the existing studies either look at the national level or concentrate on other regions such as the South-West and the North (Bose *et al.*, 2020). Many of these studies also consider only one aspect of microcredit, like productivity or income, without linking it to other important factors such as how the credit is actually used. The South-East has unique socio-economic and environmental conditions. Because of this, findings from other regions may not apply to it. The differences can be seen in the structure of cooperatives, access to extension services, and the nature of local markets. For this reason, it is not yet clear whether microcredit has truly helped small-scale farmers in Southeast Nigeria to increase their income or use credit productively. Understanding these relationships is very important because smallholder farming is still the main source of

livelihood for many rural families in the region. The government is also making efforts to expand financial inclusion and promote rural development, and such efforts require clear evidence on what works and what does not.

Objectives of the Study

This study focuses on the impact of microcredit on two related outcomes among small-scale farmers in rural Southeast Nigeria:

1. to determine the effect of microcredit on the income levels of small-scale farmers, and
2. to assess how farmers use credit for income-generating activities.

Hypotheses

The following hypotheses guided the study:

Hypothesis 1 (Income levels):

H₀: Microcredit use has no statistically significant effect on the income levels of small-scale farmers in rural Southeast Nigeria.

H₁: Microcredit use has a statistically significant positive effect on the income levels of small-scale farmers in rural Southeast Nigeria.

Hypothesis 2 (Income-generating activities):

H₀: There is no statistically significant difference in the perceived impact on income-generating activities between microcredit beneficiaries and non-beneficiaries.

H₁: There is a statistically significant difference in the perceived impact on income-generating activities between microcredit beneficiaries and non-beneficiaries.

Theoretical and Conceptual Framework

This study is grounded in neoclassical production theory, which holds that agricultural output is a function of the inputs applied in the production process. The Cobb-Douglas production function provides the principal analytical framework. First developed by Cobb and Douglas (1928), this function models output as a multiplicative function of inputs such as labour, capital, land, and technology. Its log-linear form permits estimation through ordinary least squares regression, making it particularly suitable for farm-level analysis in developing-country contexts where data constraints are common. The Cobb-Douglas specification has been widely applied in agricultural economics to examine the relationship between inputs and outputs in smallholder farming systems (Tenaye, 2020).

In the context of smallholder agriculture, capital is a critical constraint. The credit rationing theory of Stiglitz and Weiss (1981) provides the theoretical basis for understanding why small-scale farmers are systematically excluded from formal credit markets. Under conditions of imperfect information, lenders ration credit to reduce adverse selection and moral hazard, disproportionately affecting small-scale borrowers who lack collateral. The resulting credit constraint prevents farmers from purchasing optimal levels of productive inputs, leading to sub-optimal output and income. Microcredit relaxes this constraint by

providing small, accessible loans designed for borrowers excluded from formal banking. By increasing the capital available for production, microcredit is expected to shift the production function upward, leading to higher output and income. This theoretical expectation justifies the inclusion of microcredit use as a key explanatory variable in the Cobb-Douglas specification adopted in this study.

The study also draws on the sustainable livelihood's framework (Chambers & Conway, 1991), which recognises that rural households pursue diverse livelihood strategies to reduce vulnerability and improve well-being. Access to financial capital, including microcredit, is one of five asset categories (alongside human, social, natural, and physical capital) that determine a household's capacity to undertake productive activities. Within this framework, microcredit enhances financial capital, which in turn enables investment in income-generating activities, adoption of improved technologies, and participation in market-oriented production. The combination of production theory, credit rationing theory, and the livelihoods framework provides a robust conceptual basis for examining both the income effects and the broader livelihood implications of microcredit among small-scale farmers.

Literature Review

Microcredit and Farm Income

The relationship between microcredit and agricultural income has received growing scholarly attention, particularly in sub-Saharan Africa and South Asia. At the theoretical level, microcredit is expected to increase farm income by relaxing the capital constraint that prevents smallholders from purchasing optimal levels of inputs. Empirical evidence broadly supports this expectation, although the magnitude and sustainability of income effects vary across contexts.

In Nigeria, several studies have reported positive income effects of microcredit. Ogbonna et al. (2025) found that access to microcredit led to higher yields and farm income among smallholder beneficiaries in Southeast Nigeria, with gains attributable primarily to investments in improved seeds, fertilisers, and hired labour. Ogunleye et al. (2025) examined poultry farmers and showed that microcredit access improved profit efficiency, with borrowers performing significantly better than non-borrowers. Bello et al. (2022) reported a positive income effect of the Anchor Borrowers' Programme among smallholder maize farmers in Kwara State. These findings suggest that microcredit can function as a catalyst for productivity improvement when directed toward productive investment.

Beyond Nigeria, the evidence is similarly encouraging but context-dependent. Awotide et al. (2015) used propensity score matching to assess the impact of credit access on smallholder cassava farmers in Nigeria and found significant positive effects on agricultural productivity. Nordjo and Adjasi (2020) reported that credit access improved smallholder productivity in Ghana, particularly when combined with technical support.

The evidence also highlights important caveats. Balana and Oyeyemi (2022) examined agricultural credit constraints in Nigeria and found that access remains severely limited, with only a small fraction of smallholders able to secure formal credit. They argued that structural barriers in the financial system, including information asymmetry, high transaction costs, and perceived lending risk, continue to exclude the majority of small-scale farmers from credit markets. This observation is consistent with the credit rationing framework of Stiglitz and Weiss (1981) and underscores the importance of alternative credit delivery mechanisms, including microfinance.

The determinants of income among credit beneficiaries also merit attention. Studies consistently identify education, farming experience, farm size, and cooperative membership as significant positive determinants of farm income (Akintunde et al., 2024; Mba et al., 2022; Ojide et al., 2021). Age and labour cost are commonly reported as negative determinants, reflecting declining physical capacity and rising production expenses (Adamu et al., 2021; Mukaila et al., 2021). The interaction between these socioeconomic variables and credit access is critical: microcredit may amplify the income gains from education and cooperative membership by providing the financial resources needed to act on the knowledge and networks they provide.

Microcredit and Income-Generating Activities

A second strand of the literature examines how microcredit affects the range and intensity of income-generating activities undertaken by rural households. Researchers have observed that engagement in diverse income-generating activities helps households to cope with risks and maintain stable consumption levels (Muhammed et al., 2023; Jimoh et al., 2024). Farmers with access to credit are often able to engage in a wider range of productive activities because they can invest in both farm and non-farm ventures (Jimoh et al., 2024).

Bandiera et al. (2022) examined the relationship between microfinance and economic diversification using evidence from multiple developing countries and found that credit access facilitated diversification of income sources, which contributed to income stability and reduced vulnerability to shocks. Ilesanmi et al. (2024) evaluated microcredit effects on rural livelihoods in Southwest Nigeria and reported that credit access improved farm-level investment and household welfare, although the extent of benefits depended on household composition, access to markets, and extension service quality. Namayengo *et al.* (2023) conducted a comparative study on microcredit and agricultural production among resource-poor rural women and found that credit access facilitated investment in productive inputs and enhanced market participation. These findings collectively suggest that microcredit not only raises income levels but also shapes the qualitative character of economic engagement among rural households.

However, significant gaps persist. Most studies treat the use of credit for specific income-generating activities as a secondary outcome rather than a primary focus. Very few studies explore how credit is actually deployed at the household level — whether loans are used for

productive investment or diverted to consumption. In Southeast Nigeria, this question is particularly understudied. Furthermore, many existing studies rely on descriptive comparisons or simple cross-sectional analysis without correcting for selection bias, limiting the robustness of their conclusions. This study addresses these gaps by combining OLS regression analysis of income determinants with a direct assessment of how credit is perceived to affect income-generating activities, using propensity score matching to enhance comparability between beneficiary and non-beneficiary groups.

Methodology

Study Area

This study was conducted in the South-East agro-ecological zone of Nigeria. The South-East zone comprises five states: Abia, Anambra, Ebonyi, Enugu, and Imo. The states are within the South-East rainforest zone of Nigeria. The area has a population of 21,955,334, comprising 3,727,347 people from Abia State, 5,408,756 from Imo State, 5,527,809 from Anambra State, 4,411,119 from Enugu State, and 2,880,303 from Ebonyi State (NPC, 2006). Imo and Anambra are the most populous states of the zone and have a high concentration of economic activities. The South-East states are among the densely settled areas of the country, with an average population density of 247 persons per square kilometre as against the national average of 96 persons per square kilometre (NPC, 2006). The zone is located on latitudes 5°06'N to 6°34'N of the Equator and longitudes 6°38'E and 8°08'E of the Greenwich (Prime) Meridian. It has a tropical humid climate with two distinct seasons per year, the rainy and dry seasons. Within the two seasons, the temperature range varies from about 18°C to 34°C. Credit institutions that facilitate access to credit exist in the study area and include commercial banks, microfinance banks, cooperatives, the Bank of Agriculture, and the Bank of Industry.

Sampling Procedure

A multi-stage sampling technique was used for the study. The first stage involved the purposive selection of three states in Southeast Nigeria with a high proportion of small-scale farmers in rural areas: Imo, Anambra, and Abia. The second stage involved the selection of three Local Government Areas (LGAs) from each of the three selected states: Umu Nneochi, Bende, and Ohafia LGA from Abia State; Aboh-Mbaise, Ehime Mbano, and Ihitte/Uboma LGA from Imo State; and Aguata, Orumba South, and Anocha LGA from Anambra State. The third stage involved the selection of four communities from each of the selected LGAs, giving a total of 36 communities. The fourth stage involved the selection of ten small-scale farmers from each of the selected communities, giving a total of 360 respondents.

Treatment households (those that had received microcredit) and comparison households (those that had not) were identified from existing datasets provided by at least three microfinance banks operating in each of the three states. These datasets listed the locations

and credit amounts of small-scale farmers who had accessed microcredit. The datasets together identified 607 households who were small-scale farmers that had received microcredit from the microfinance banks. From this sampling frame, 180 treatment and 180 comparison households were selected, with 60 treatment and 60 comparison households interviewed per state.

Propensity Score Matching

Propensity score matching (PSM) was employed to address potential selection bias arising from non-random assignment to the treatment group, following the methodology outlined by Rosenbaum and Rubin (1983) and the practical guidance provided by Caliendo and Kopeinig (2008). Since farmers who accessed microcredit may differ systematically from non-beneficiaries in ways that also affect income, PSM was used to construct a comparison group that closely resembled the treatment group on observable characteristics.

In the first step, a logit model was estimated to predict the probability of accessing microcredit (the propensity score) as a function of nine pre-treatment covariates: age, marital status, level of education, sex, household size, farm size, farming experience, distance to farm, and cooperative membership. These covariates were selected on the basis that they are theoretically related to both the likelihood of accessing microcredit and the outcome variable (income), as established in the existing literature on smallholder credit access in Nigeria (Balana & Oyeyemi, 2022).

In the second step, nearest-neighbour matching with replacement was implemented, using a caliper of 0.05 standard deviations of the logit of the estimated propensity score. This caliper width was chosen to balance the trade-off between bias reduction and sample retention. Matching with replacement was used to minimise bias in contexts where the distributions of propensity scores differ between groups. Each treated household was matched to the comparison household with the closest propensity score within the specified caliper.

Balance diagnostics were assessed by comparing the standardised mean differences of each covariate between the treatment and comparison groups before and after matching. Prior to matching, several covariates showed statistically significant differences between groups, particularly education level, cooperative membership, and farm size. After matching, the standardised mean differences for all nine covariates fell below the conventional threshold of 10%, indicating adequate balance. The common support condition was imposed to ensure that comparisons were made only within the region of overlap in propensity score distributions between the two groups. Observations outside the common support region were excluded from the analysis. The final matched sample retained the full 360 households (180 treated, 180 comparison), as all observations fell within the common support region.

Data Collection

Data were gathered using structured questionnaires and interviews, capturing information

on socioeconomic characteristics, income levels, farm income, and credit utilisation activities. A reliability score of 95.8% was recorded following a Pearson correlation method.

Analytical Framework

Mean scores based on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) were used to assess the perceived impact of microcredit use on income-generating activities. Ordinary least squares multiple regressions using a double-log Cobb-Douglas production model was employed to estimate the effect of microcredit on annual income. The analysis was conducted at a five percent level of significance.

The double-log Cobb-Douglas models are specified as follows:

Equation 1 (Treated and Comparison models separately):

$$\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \dots + \beta_{13} \ln X_{13} + \mu$$

Equation 2 (Pooled model):

$$\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \dots + \beta_{14} \ln X_{14} + \mu$$

Where:

Y = Annual income level of the farmers (Naira);

X₁ = Age of respondents (years);

X₂ = Marital status (Dummy: Married = 1, Otherwise = 0);

X₃ = Level of education (years);

X₄ = Sex of respondents (Male = 1, Female = 0);

X₅ = Household size (headcount);

X₆ = Farm size (hectares);

X₇ = Farming experience (years);

X₈ = Distance to farm (km);

X₉ = Labour cost (Naira);

X₁₀ = Extension contacts (counts);

X₁₁ = Cooperative membership (Yes = 1, No = 0);

X₁₂ = Quantity of agrochemical (litres);

X₁₃ = Quality of planting materials (Exotic = 1, Otherwise = 0);

X₁₄ = Microcredit use (Access = 1, No access = 0);

μ = Error term.

Equation 1 was used to model the determinants of income level for the treated and comparison households separately, while Equation 2 introduced the variable microcredit use in a pooled model to measure its impact on income level of rural farmers in Southeast Nigeria.

Results and Discussion

Impact of Microcredit on Income Levels (OLS Regression)

The ordinary least squares regression results of the impact of microcredit on income levels of small-scale farmers in Southeast Nigeria are presented in Table 1. The Cobb-Douglas function was used to maintain fair comparison across the models.

Table 1: OLS Regression Results — Impact of Microcredit on Income Levels of Small-Scale Farmers in Southeast Nigeria

Variable	Treated Households	Comparison Households	Pooled
Constant	7.176 (9.826) ***	5.363 (6.347) **	8.175 (10.286) ***
Age of respondents	-1.021 (-2.610) **	-0.849 (-2.196) **	-1.860 (-3.912) ***
Marital status	0.105 (1.329)	1.029 (3.071) ***	-0.211 (-1.225)
Level of education	1.237 (3.372) ***	0.577 (2.951) ***	1.334 (3.413) ***
Sex of respondents	0.562 (1.022)	0.012 (0.936)	0.053 (1.084)
Household size	1.165 (2.435) **	0.042 (0.554)	1.078 (2.264) **
Farm size	1.281 (2.627) **	0.683 (2.513) **	0.748 (2.575) **
Farming experience	1.366 (3.438) ***	1.277 (2.323) **	1.632 (2.814) ***
Distance to farm	0.207 (1.511)	-1.887 (-2.460) **	0.072 (0.024)
Labour cost	-1.986 (-4.352) ***	-0.889 (-2.179) **	-1.625 (-3.168) ***
Extension contacts	0.196 (1.387)	0.467 (1.210)	0.012 (1.198)
Cooperative membership	1.176 (4.826) ***	0.715 (3.189) ***	0.572 (2.185) **
Quantity of agrochemical	1.242 (2.636) **	1.621 (3.296) ***	1.179 (2.543) **
Quality of planting materials	1.550 (3.240) ***	0.157 (1.144)	1.087 (2.368) **
Microcredit use	—	—	1.329 (3.985) ***
R ²	0.905	0.864	0.933
Adjusted R ²	0.872	0.824	0.902
F-statistic	32.028***	28.947***	38.645***
Durbin-Watson	1.923	1.863	1.946
N	180	180	360

Source: Field Survey Data, 2025.

Note: ** and *** signify 1% and 5% levels of significance respectively. Values in parentheses are t-values. *

Diagnostic Performance

The models demonstrated strong explanatory power. For treated households, the R² of 0.905 indicates that the included variables explained approximately 91% of the variation in income. The adjusted R² of 0.872 confirms robust explanatory power after adjusting for the number of predictors. The F-statistic of 32.028, significant at the one percent level, demonstrates that the independent variables collectively exerted a statistically significant influence on income. For comparison households, the R² of 0.864 and the significant F-statistic of 28.947 similarly confirm model adequacy. The pooled model showed the highest explanatory power (R² = 0.933, adjusted R² = 0.902, F = 38.645), and Durbin-Watson statistics close to 2.0 across all three models suggest no serious autocorrelation.

Variable-by-Variable Discussion

Age of respondents was negative and significant in both the treated ($\beta = -1.021$, $p < 0.05$) and comparison ($\beta = -0.849$, $p < 0.05$) models, and highly significant in the pooled model ($\beta = -1.860$, $p < 0.01$). Older farmers earned lower income across all groups, likely reflecting declining physical ability and slower adoption of improved farming practices. This finding is consistent with Akintunde et al. (2024) and Adamu et al. (2021), who reported that increasing age reduced farm household income.

Level of education was positive and significant at the one percent level across all three models (treated: $\beta = 1.237$; comparison: $\beta = 0.577$; pooled: $\beta = 1.334$). Education equips farmers with managerial skills, improves access to information, and enhances their capacity to adopt productivity-enhancing technologies. This finding aligns with Ojide et al. (2021).

Household size was positive and significant for treated households ($\beta = 1.165$, $p < 0.05$) and in the pooled model ($\beta = 1.078$, $p < 0.05$), but non-significant for comparison households. This suggests that larger households benefited from credit access by deploying family labour more effectively to support expanded production — an advantage that did not materialise without credit.

Farm size was positive and significant across all three models (treated: $\beta = 1.281$; comparison: $\beta = 0.683$; pooled: $\beta = 0.748$; all $p < 0.05$). Larger farms promote economies of scale, increase production volume, and enhance market participation. This finding agrees with Ogbonna (2023).

Farming experience was positive and significant in all three models (treated: $\beta = 1.366$, $p < 0.01$; comparison: $\beta = 1.277$, $p < 0.05$; pooled: $\beta = 1.632$, $p < 0.01$). Experience enhances technical competence, managerial decision-making, and the ability to manage production risks. This agrees with Mba et al. (2022).

Marital status was significant only for comparison households ($\beta = 1.029$, $p < 0.01$), suggesting that married farmers in the non-beneficiary group benefited from greater household support and shared responsibilities that enhanced farming efficiency. This finding agrees with Ogbonna (2023).

Distance to farm was significant only for comparison households ($\beta = -1.887$, $p < 0.05$), indicating that longer distances reduced income by increasing transportation costs and reducing productive time. This agrees with Adefalu et al. (2016). The non-significance for treated households may indicate that credit access enabled these farmers to offset transportation costs through investment in better logistics.

Labour cost was negative and significant across all three models: treated ($\beta = -1.986$, $p < 0.01$), comparison ($\beta = -0.889$, $p < 0.05$), and pooled ($\beta = -1.625$, $p < 0.01$). Higher labour expenditure consistently reduced net income, indicating that escalating labour costs represent a structural constraint on smallholder profitability. This finding aligns with Mukaila et al. (2021). The consistency of the negative effect across all three models underscores the importance of labour-saving technologies and efficient labour management in smallholder farming systems.

Extension contacts were non-significant in all three models (treated: $t = 1.387$; comparison: $t = 1.210$; pooled: $t = 1.198$). While the coefficients were positive, they did not reach statistical significance, suggesting that the frequency of extension contact alone did not translate into measurable income gains in this sample. This may reflect variability in the quality and relevance of extension services delivered.

Cooperative membership was positive and significant across all three models (treated: $\beta = 1.176$, $p < 0.01$; comparison: $\beta = 0.715$, $p < 0.01$; pooled: $\beta = 0.572$, $p < 0.05$). Cooperatives improve access to credit, inputs, training, and extension services. This aligns with Olaniyan (2025) and Sofoluwe and Yinusa (2021).

Quantity of agrochemicals was positive and significant across all three models (treated: $\beta = 1.242$, $p < 0.05$; comparison: $\beta = 1.621$, $p < 0.01$; pooled: $\beta = 1.179$, $p < 0.05$), indicating that adequate agrochemical application reduced pest and disease losses and improved productivity.

Quality of planting materials was positive and significant for treated households ($\beta = 1.550$, $p < 0.01$) and in the pooled model ($\beta = 1.087$, $p < 0.05$), but non-significant for comparison households. This pattern suggests that credit access enabled treated farmers to purchase improved planting materials that non-beneficiaries could not afford. This agrees with Orgu et al. (2021).

Microcredit use, included only in the pooled model, was positive and highly significant ($\beta = 1.329$, $p < 0.01$). This is the central finding of the study: farmers who accessed microcredit earned significantly higher incomes, providing direct support for rejecting H_{01} . Microcredit provides additional capital for purchasing modern inputs, expanding farm size, and improving agronomic practices. This finding agrees with Bello et al. (2022) and is consistent with the broader evidence from Awotide et al. (2015) and Nordjo and Adjasi (2020).

Impact of Microcredit Use on Income-Generating Activities

The findings presented in Table 2 provide evidence on the perceived impact of microcredit use on the income-generating activities of small-scale farmers in rural Southeast Nigeria.

Table 2: Mean Score Assessment of the Impact of Microcredit Use on Income-Generating Activities

S/N	Item Statement	Treated (n=180)	Comparison (n=180)	Pooled (n=360)	t-value
1	Credit has increased my confidence to run income-generating activities	4.28	3.02	3.65	7.214***
2	Because of credit I feel more able to take small business risks	4.15	2.89	3.52	6.982***
3	Credit enabled me to buy farm inputs and working capital on time	4.36	3.14	3.75	7.845***
4	With credit I expanded the scale of my main activity or started another	4.08	2.97	3.53	6.456***

S/N	Item Statement	Treated (n=180)	Comparison (n=180)	Pooled (n=360)	t-value
5	Credit helped me to hire extra labour during peak periods	3.94	2.85	3.40	6.112***
6	Since credit my household income flows are more stable across seasons	4.11	2.92	3.52	6.734***
7	My contribution to household income has increased and I am consulted more	4.02	2.87	3.45	6.328***
8	Membership in a credit group widened my business network and safety nets	4.17	3.01	3.59	7.014***
9	Credit groups and training taught me better ways to manage and negotiate	4.09	2.95	3.52	6.547***
10	Because of credit I adopted improved technologies or practices	4.23	3.12	3.68	7.426***
	Grand mean score	4.14	2.97	3.56	6.891****

Source: Field Survey Data, 2025.

*Note: Mean scores are based on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). For comparison households who did not receive microcredit, the items were worded in the negative form (e.g., "Without credit one could not buy farm inputs on time"). Higher mean scores for treated households indicate stronger positive experiences relative to comparison households. The t-values compare treated and comparison households. ** denotes significance at 1% level.**

For treated households, the grand mean of 4.14 indicates strong agreement that microcredit positively influenced income-generating activities. The highest-rated item was that credit enabled timely purchase of farm inputs and working capital (mean = 4.36), suggesting that liquidity was a major benefit. Farmers also reported high confidence in running income-generating activities (4.28), improved ability to take business risks (4.15), and enhanced technology adoption (4.23). These findings indicate that credit access strengthened the financial empowerment, agency, and productive capacity of beneficiaries.

For comparison households, the substantially lower grand mean of 2.97 indicates weaker experiences. The lowest ratings related to ability to take business risks (2.85), hiring extra labour (2.85), and household income contribution (2.87), suggesting that the absence of credit constrained investment and productive capacity.

The t-values for all ten items were significant at the one percent level, providing strong evidence for rejecting H_{02} . These findings align with Bandiera et al. (2022), Ilesanmi et al. (2024), and Namayengo et al. (2023). However, the use of differently worded items for the two groups (positive framing for treated, negative framing for comparison) introduces a measurement equivalence concern. Differences in item wording may systematically

influence response patterns, and this should be considered when interpreting the magnitude of mean differences.

Limitations

Several limitations should be acknowledged. First, the cross-sectional design captures associations at a single point in time and cannot establish causal relationships. Farmers who accessed microcredit may have had pre-existing characteristics predisposing them to higher income, even though propensity score matching was employed to mitigate selection bias. Second, income data were self-reported and may be subject to recall bias, particularly for farmers who do not keep formal records. Third, the absence of baseline (pre-credit) data prevents before-and-after comparison, limiting the attribution of observed differences directly to microcredit. Fourth, the study was conducted in three of the five states in Southeast Nigeria (Abia, Imo, and Anambra), and findings may not be generalisable to Ebonyi and Enugu States or to other agro-ecological zones. Fifth, although PSM was applied with balance diagnostics confirming adequate covariate balance, the method controls only for observable characteristics; unobservable factors such as farmer motivation, entrepreneurial orientation, or prior business experience may still confound the treatment effect. Sixth, the differently worded Likert-scale items for treated and comparison households introduce a measurement equivalence concern, as differences in item framing may influence response patterns independently of the substantive treatment effect.

Conclusion

This study examined the impact of microcredit on income levels and income-generating activities of small-scale farmers in rural Southeast Nigeria. Drawing on data from 360 farming households across Abia, Imo, and Anambra States, the analysis employed ordinary least squares regression using a Cobb-Douglas production function and mean-score analysis based on a five-point Likert scale.

The regression results provide clear evidence that microcredit use has a positive and statistically significant effect on the income levels of small-scale farmers. In the pooled model, microcredit was one of the strongest predictors of income ($\beta = 1.329$, $p < 0.01$), confirming that access to credit enables farmers to invest in productive inputs and expand their farming operations. The null hypothesis that microcredit has no significant effect on income levels is therefore rejected. Beyond microcredit, the findings highlight that education, farming experience, cooperative membership, farm size, and the use of quality planting materials and agrochemicals are important determinants of income across both beneficiary and non-beneficiary groups. Age and labour cost emerged as constraints, reflecting the challenges of declining physical capacity and rising production costs in smallholder systems.

The mean-score analysis confirms that microcredit beneficiaries perceived significantly stronger positive effects on income-generating activities across all ten indicators measured,

with all differences significant at the one percent level. Credit access facilitated timely purchase of inputs, enhanced confidence in business activities, strengthened technology adoption, and improved seasonal income stability. These perceived benefits were notably weaker among non-beneficiary households, underscoring the developmental gap created by the absence of credit.

The study contributes to the empirical literature in two principal ways. First, it provides region-specific evidence for Southeast Nigeria, an area that has received limited research attention. Second, it combines regression analysis of income determinants with a direct assessment of how credit affects income-generating activities, linking the quantitative income effect with the behavioural and attitudinal dimensions of credit use. However, the conclusions are tempered by the cross-sectional design, self-reported income data, and the geographic scope restricted to three of five states. Future research should adopt longitudinal or quasi-experimental designs to strengthen causal inference, incorporate objective income verification methods, and extend geographic coverage. Studies examining the long-term sustainability of microcredit-driven income gains and the conditions under which credit is most productively utilised would be particularly valuable.

Recommendations

The finding that microcredit use significantly increased income levels in the pooled model ($\beta = 1.329$, $p < 0.01$) underscores the need for expanded and better-structured microcredit programmes in rural Southeast Nigeria. Microfinance institutions, in collaboration with state agricultural development programmes, should increase the availability and accessibility of credit products designed specifically for small-scale farmers. Loan products should be tailored to the agricultural calendar, with repayment schedules aligned to harvest periods, to reduce default risk and ensure that farmers deploy credit for productive purposes.

The regression results show that education was positive and significant across all three models, while cooperative membership significantly improved income for both beneficiary and non-beneficiary groups. These findings suggest that microcredit programmes should incorporate training components covering financial planning, basic farm management, and market access strategies. The significant role of cooperatives indicates that policymakers should invest in strengthening cooperative organisations, which serve as effective channels for delivering both credit and agricultural knowledge.

The mean-score results reveal that treated farmers strongly agreed that credit enabled them to purchase inputs on time (mean = 4.36) and adopt improved technologies (mean = 4.23). These findings highlight the importance of linking microcredit programmes with input supply systems and technology transfer mechanisms. Agricultural extension services should ensure that farmers receiving credit are guided in efficient input use and adoption of improved practices, thereby maximising productivity gains.

Finally, the finding that labour cost was a significant constraint on income across all three models points to the need for broader rural development investments. Improvements in rural infrastructure, including farm-access roads and storage facilities, would reduce production and marketing costs. An integrated approach combining credit access with extension support, cooperative strengthening, and infrastructure development is most likely to produce sustainable improvements in smallholder income and livelihood security.

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