



EXPLORING THE ROLE OF MICROCREDIT IN ENHANCING INCOME DIVERSIFICATION AMONG SMALLHOLDER FARMERS IN SOUTHEAST NIGERIA

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ABSTRACT

The study explored the role of microcredit in enhancing income diversification among Smallholder Farmers in Southeast Nigeria. A multistage sampling technique was used in selecting 360 respondents from the study area. Data were collected using structured questionnaire and analyzed using descriptive statistics, Student's t-test, and probit regression analysis. The results showed that microcredit beneficiaries recorded a significantly higher mean income diversification index of 6.83 compared with 4.71 for non-beneficiaries, with the difference being statistically significant at the 1% level. The probit regression results further reveal that microcredit use exerted a positive and statistically significant effect on the likelihood of income diversification among farmers. Other important determinants of income diversification included age, level of education, household size, farm size, farming experience, distance to farm, labour cost, and cooperative membership. Age of respondents was negative and significantly related to income diversification at the 5% level. Level of education was positive and significant at the 1% level. Household size was positive and significant at the 5% level. Farming experience was positive and significant at the 1% level. Farming experience was positive and significantly related to income diversification at the 1% level. Distance to farm was positive and significant at the 1% level. This suggests that farmers who travel longer distances to their farms were more likely to diversify their income sources. Labour cost was negative and significant at the 10% level. This indicates that higher labour costs reduced the likelihood of income diversification among farming households. Cooperative membership was positive and significant at the 1% level. This shows that farmers who were part of cooperatives were more likely to diversify their income sources. Cooperative membership provides access to information, credit opportunities, and collective learning which encourages farmers to invest in additional livelihood activities. The findings indicate that access to microcredit reduces financial constraints and enhances farmers' capacity to engage in multiple income-generating activities, thereby improving livelihood resilience. The study concludes that microcredit plays a critical role in promoting diversified livelihood strategies among rural farming households. It therefore recommended the need to strengthen rural microfinance delivery systems and integrating credit provision with complementary support services to enhance sustainable income diversification.

Keywords: Microcredit, Income, Diversification, Small-scale, Rural, Livelihoods

INTRODUCTION

Agriculture remains the economic backbone of rural sub-Saharan Africa, and Nigeria is no exception (Afolabi *et al.*, 2024). In Nigeria's Southeast zone, the vast majority of households depend on small-scale farming for their livelihoods. These smallholder farmers often operate under severe resource constraints. Ogbonna, *et al* (2025) report that farmers in Abia, Imo, and Anambra states face persistent financial constraints that limit agricultural productivity and exacerbate food insecurity. Such constraints trap many rural households in poverty. Indeed, an estimated 80% of Nigeria's rural population lives below the poverty line (Afolabi *et al.*, 2024). In this context, incomes derived solely from subsistence farming are highly vulnerable to shocks (e.g., weather, pest, or market fluctuations). Diversifying income, by adding non-farm activities or alternative crops is widely recognized as essential for rural resilience and development (Bandiera *et al.*, 2022). Households that fail to diversify their income sources remain at greater risk of food insecurity and poverty. Mukaila *et al.* (2021) found in Enugu State that 66% of smallholder farmers had no income outside of agriculture; on average, 72.3% of household income came from farming, while off-farm and non-farm sources contributed only 16.3%



and 11.4%, respectively, suggesting that most farm families remain highly specialized in agriculture and earn limited earnings from other economic activities.

Smallholder credit constraints are a major part of this problem. In many developing countries, access to formal finance is scarce for rural residents, and poor farmers rely instead on informal borrowing or self-financing (Yusuf *et al.*, 2025). In Nigeria, the government has tried to bridge this gap by fostering a microfinance sector. The Microfinance Bank (MFB) system was launched in 2007 precisely to extend credit and other financial services to poor and low-income households (Yusuf *et al.*, 2025). By 2024, some 882 MFBs were licensed by the Central Bank of Nigeria, operating nationwide to serve clients excluded from commercial banks (Yusuf *et al.*, 2025). These institutions offer small loans, savings facilities, domestic transfers, and other services tailored to rural entrepreneurs and small businesses. The goal is to empower the “economically active poor, including subsistence farmers, by giving them the capital needed to invest in production or business ideas. In theory, microcredit should alleviate rural liquidity constraints: as Yusuf *et al.*, (2025) noted that credit is a potential solution to liquidity constraints that often limit rural households from investing in productive enterprises. Indeed, access to microloans and related services is seen as an essential driver of sustainable livelihoods in low-income settings Yusuf *et al.*, (2025). By enabling investments in tools, inputs, or new enterprises, credit can increase farm productivity and broaden household income sources.

The international evidence provides mixed guidance. In Uganda, Bandiera *et al.* (2022) show that introducing microfinance led many women borrowers to shift labor out of agriculture and into service-based activities such as small-scale trading (Bandeira *et al.*, 2022). This indicates a positive structural change: borrowers used loans to start trading businesses, moving beyond subsistence farming. However, that study also notes that after two years there were no large gains in consumption or overall wealth; the benefits of diversification were relatively modest (Bandiera *et al.*, 2022). In Nigeria, a handful of studies link credit to higher yields and better food security (Ogbonna *et al.*, 2025), but none specifically analyze income diversification. A related strand finds that Nigerian households with diverse income sources tend to be less poor (Mukaiila *et al.*, 2021), emphasizing the importance of diversification for poverty reduction. Yet it remains unknown whether microcredit participation actually leads Southeast Nigerian farmers to diversify.

The broader development literature shows the rationale for diversification. Many scholars argue that rural poverty can only be reduced when farm households move into higher-return, non-agricultural activities (Bandiera *et al.*, 2022). Indeed, one analysis states that diversification out of subsistence agriculture is often seen as the sine qua non of economic development (Bandiera *et al.*, 2022). In Nigeria, research on income sources confirms limited diversification (Okon *et al.*, 2017; Mukaila *et al.*, 2021), national surveys show that non-farm earnings remain a small fraction of total rural income. Moreover, factors that influence diversification include education, farm size, and credit availability (Mukaiila *et al.*, 2021). Access to extension services and to credit are repeatedly found to raise rural incomes and enable farmers to engage in off-farm work (Mukaiila *et al.*, 2021). This suggests a potential pathway: if microcredit relaxes financial constraints, it could allow farmers to pursue income-generating projects outside traditional cropping.

Despite the expansion of microfinance in rural Nigeria, smallholders in the Southeast remain vulnerable. It is unclear whether microcredit has actually enabled farm families to diversify their incomes beyond traditional agriculture. The prevailing situation, heavy dependence on crop income with minimal non-farm earnings implies that many households continue to face high risk. Without additional revenue streams, farmers are exposed to seasonal or one-time shocks. In this context, it is important to ask whether microcredit can help households adopt alternative livelihood activities (such as trading, processing or wage labor) that would smooth incomes and reduce poverty. Empirically, however, this link between microcredit and income diversification in Nigeria is poorly documented. Most existing studies on Nigerian agriculture and finance examine productivity or adoption of new technologies, but few look at the effect on livelihood portfolios. Fakunle *et al.* (2025) review the literature on smallholder agricultural finance in Nigeria and find that while various funding streams are identified, it is unclear how these funds will affect farm productivity (Okon, *et al.*, 2024), the use of modern farming technology, and the farmers’ standard of living. In other words, the impact of credit



programs on farmers' welfare remains ambiguous in the literature. Likewise, prior research on Nigeria's microfinance banks has focused on credit supply and challenges, but none of these studies have focused on the impact of microfinance banks on promoting livelihood practices among farmers (Mukaila *et al.*, 2021). In short, there is a significant gap: we do not know whether and how microcredit participation encourages rural households in Southeast Nigeria to diversify their incomes.

Understanding this issue has strong socioeconomic implications. Southeast Nigeria, though relatively more commercialized than the far north, still has a large smallholder sector characterized by fragmented landholdings and low farm incomes. The region's farmers often juggle multiple tasks, and improvements in any non-farm activity could substantially raise their welfare. Access to credit is one potential lever: by providing seed capital, microcredit could help a farmer start a petty trading business, buy livestock, or expand processing of farm produce, thereby generating off-farm earnings. Empirical evidence suggests that in Nigeria, farmers with credit access tend to have higher overall incomes (since they can invest in productivity-enhancing inputs) (Ogbonna *et al.*, 2025; Bandiera *et al.*, 2022). For instance, Ogbonna *et al.* (2025) find that microcredit recipients in Southeast Nigeria achieved higher crop yields and farm incomes than non-borrowers. They conclude that microcredit "enhances agricultural productivity and food security by bridging financial gaps, enabling investments in productivity-enhancing technologies, and fostering economic resilience (Ogbonna *et al.*, 2025). Such outcomes imply that credit can lift overall living standards. What remains less clear is whether this same credit also encourages households to seek non-farm opportunities or diversify the farm portfolio (e.g. by adopting new crops or enterprises).

METHODOLOGY

This study was conducted in the South-East agro-ecological zone of Nigeria. The South-East zone comprises five states namely: Abia, Anambra, Ebonyi, Enugu and Imo States. The states are within the South-East rainforest zone of Nigeria. The area has a population of 21,955,334 and this comprise 3,727,347 people from Abia State, 5,408,756 (Imo State), 5,527,809 people (Anambra State), 4,411,119 people (Enugu state) and 2,880,303 people (Ebonyi State) (NPC, 2017). Imo and Anambra are the most populous states of the zone and have high concentration of economic activities. The South-east states are among the densely settled area of the country, with average population density of 247 persons per square kilometer as against the national average of 96 persons per square Kilometer (NPC, 2017). The zone is located on latitudes 5^o 06'N to 6^o 34'N of the Equator and longitudes 6^o 38'E and 8^o 08'E of the Greenwich (Prime) Meridian (Microsoft Corporation, 2009). It has a tropical humid climate with two distinct seasons per year namely, the rainy and dry seasons. Within the two seasons, the temperature range varies from about 18° C to 34° C. Credit institutions which helps in the provision of access to credit facilities exist in the Study area and these includes Commercial Banks, Microfinance Banks, Cooperatives, Bank of Agriculture and Bank of Industry.

Sampling Technique and Sample Size

Multi-stage sampling technique was used for the study. The first stage involved the selection of states in the south east Nigeria with a high proportion of small-scale farmers in rural areas. The second stage involved the selection of Local Government Areas (LGAs) within the selected states, while the third stage involved the selection of communities within the selected LGAs. Finally, the fourth stage involved the selection of small-scale farmers within the selected communities.

To estimate impacts, we compared outcomes of treated households (beneficiaries) to comparison households (non-beneficiaries) in three Nigerian south-eastern states We identified a set of treatment households that had received microcredit from available sources in the area, and a set of comparison households that had not received microcredit from these available sources. All households selected for the study were those identified by financial institutions and found in their datasets, which we received, describing the amount of microcredit they had received.

Method of Data Collection

We then collected data on livelihood outcomes of a random sample of households that were most likely to benefit from having access to microcredit in those areas (either because they currently had access to microcredit or because they would in the future). We drew our treatment and comparison



households from existing datasets and used propensity score matching to ensure that the comparison group was in the same location as the treatment group. We received datasets from at least three (3) microfinance banks operating in each of the studied states (Abia, Imo, and Anambra) that listed locations in terms of Local Government Areas of small-scale farmers who had accessed microcredit from these MFBs. The datasets together identified a total of 607 households who were small-scale farmers that had received microcredit from the MFBs in South-East Nigeria. We sampled 180 treatment and 180 comparison households. We interviewed 60 treatment households and 60 comparison households in each of the three proposed states, for a total of 360 households surveyed in the three proposed states. This analytic sample size was designed to cost-effectively provide early insights on potential livelihood impacts of microcredit demand. The treatment households were spread across 65 Local Government Areas of the proposed states. Data were gathered using structured questionnaires and interviews, capturing information on socioeconomic characteristics, income level, farm income level, income diversification activities, among other relevant variables. A reliability score of 95.8% was recorded following a Pearson correlation method. The data were analyzed using descriptive statistics, such as frequency tables, percentages, and means, to describe the level of income diversity of the rural farmers. Probit regression analysis techniques was employed to estimate the effect of microcredit use on income diversification of the rural farmers. Inferentially, the Student's t-test was used to compare the level of income diversity of the sampled treated and comparison households in the area of study.

Method of Data Analysis

The analysis was conducted at a 5% level of significance, and the results were interpreted in line with the findings of existing but related empirical studies. Here treated households refer to those farmers that are microcredit beneficiaries while comparison households are rural farmers who are non-beneficiaries of microcredit. The double-log forms of the Cobb-Douglas production model used to estimate the effect of microcredit on level of income of farmers in the study area is specified as

$$\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \dots + \beta_{13} \ln X_{13} + \mu \dots (\text{Eq.1})$$

$$\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \dots + \beta_{14} \ln X_{14} + \mu \dots (\text{Eq.2})$$

- 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 (head count)
- X₆ = Farm Size (ha)
- X₇ = Farming Experience (years)
- X₈ = Distance to Farm (K)
- X₉ = Labour Cost (naira)
- X₁₀ = Extension Contacts (Counts)
- X₁₁ = Cooperative Membership (Yes = 1, No = 0)
- X₁₂ = Quantity of Agrochemical (litre)
- 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 the income level of the treated and comparison households 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 the Diversification of Income Sources of Small-scale Farmers in Rural Southeastern Nigeria

The distribution of income diversification in Table 1 showed clear differences between treated and comparison households. Among the treated group, the largest proportion of farmers (35.6 percent)



fell within the 5.1 to 10.0 diversification range, followed by 23.3% in the 1.1 to 5.0 category, while the smallest group, representing 10 percent, reported diversification above 15.0. The mean score of 6.83 indicates a relatively high level of diversification. This suggests that treated farmers engaged in multiple income generating activities, which is likely linked to the support received through microcredit programmes that reduce liquidity constraints and promote enterprise expansion. Studies have shown that access to microfinance increases livelihood diversification among rural farmers in Nigeria, reinforcing the present finding (Belonwu *et al.*, 2024; Okon, *et al.*, 2024; Ilesanmi *et al.*, 2024; Olawuyi and Olawuyi, 2022; In comparison households, the highest proportion of farmers (30%) were concentrated in the 1.0 category, followed by 33.9 percent in the 1.1 to 5.0 range, while only 4.4 percent recorded diversification above 15.0. The mean value of 4.71 points to lower diversification relative to the treated group. This pattern implies that comparison households depend on fewer income sources, likely due to limited access to credit, lower capital base and restricted livelihood opportunities. Evidence confirms that households with weaker access to finance tend to maintain undiversified income portfolios and remain more vulnerable to shocks (Olayinka and Charles, 2022; Arowolo *et al.*, 2022; Do, 2023; Osunmakinde *et al.*, 2024). For the pooled sample, the largest category was the 5.1 to 10.0 range at 29.4%, followed by 28.6% in the 1.1 to 5.0 range, while the smallest category, representing 7.2%, reported diversification above 15.0. The pooled mean of 5.77 indicates moderate overall diversification but still highlights the influence of the treatment group in raising the average. The t value of 3.549, significant at the one percent level, confirms a statistically significant difference in income diversification between treated and comparison households. This supports the conclusion that microcredit access improves diversification outcomes. Studies also report significant positive effects of microcredit on livelihood diversification, validating the observed difference in this study (Sakhani *et al.*, 2025; Hervino, 2021).

Table 1: Distribution of Small-scale Farmers by their Level of Income Diversification in Rural Southeast Nigeria

Income Diversity	Treated Households		Comparison Households		Pooled	
	Frequency	%	Frequency	%	Frequency	%
1.0	28	15.6	54	30	82	22.8
1.1 – 5.0	42	23.3	61	33.9	103	28.6
5.1 – 10.0	64	35.6	42	23.3	106	29.4
10.1 – 15.0	28	15.6	15	8.3	43	11.9
>15.0	18	10	8	4.4	26	7.2
Total	180	100	180	100	360	100
Mean	6.83		4.71		5.77	

t-value = 3.549***

Source: Field survey data, 2025.

Note: Asterisks ***denote significance at 1%, level.

A probit regression model was used to estimate the impact of microcredit on the diversification of income sources of small-scale farmers in southeast Nigeria and the result is presented in Table 2.

The diagnostic statistics for the treated households showed that the probit model demonstrated substantial explanatory strength. The pseudo-R square of 0.421 indicates that the explanatory variables jointly accounted for 42% of the likelihood of income diversification among treated farmers. The Wald chi square value of 56.382 which was significant at the 1% level confirms that the independent variables collectively exerted a statistically significant effect on the probability of income diversification. This demonstrates that the model was robust and appropriate for drawing valid inferences. Age of respondents, level of education, household size, farm size, farming experience, distance to farm, ownership of assets, and cooperative membership were the significant variables that influenced the income diversifications of farmers in the treated household group in southeast Nigeria. Age of respondents was negative and significantly related to income diversification at the 5% level. This indicates that an increase in the age of the farmer reduced the likelihood of diversifying income sources.



Older farmers tend to experience declining physical ability and slower adoption of new or innovative livelihood strategies, which constrains their engagement in multiple income-generating activities. This finding agrees with the recent studies of Ogbonna (2023), who reported that advancing age reduces the capacity and willingness of rural farmers to diversify income. Level of education was positive and significantly related to income diversification at the 1% level. This implies that farmers with higher educational attainment were more likely to diversify their sources of income. Education enhances knowledge, decision-making skills, and the capacity to identify and exploit new livelihood opportunities, enabling farmers to adopt multiple income-generating strategies. This finding is supported by Arowolo *et al.*, (2022) and Osunmakinde *et al.*, (2024), who observed that educated smallholder farmers in southeastern Nigeria exhibited greater engagement in diversified farm and off-farm activities. Household size was positive and significantly related to income diversification at the 5% level. Larger households were more likely to diversify income because additional household labour allows participation in multiple activities simultaneously. This finding aligns with the work of Belonwu *et al.*, (2024), who reported that larger household size increases the capacity of farm households to engage in both on-farm and off-farm income-generating ventures. Farm size was positive and significant at the 5% level, indicating that farmers with larger farms had a higher probability of diversifying income. Larger landholdings provide the space and resources for multiple enterprises, allowing farmers to allocate plots for different crops or integrate crop and livestock systems. This result is consistent with Ilesanmi *et al.*, (2024), who found that farm size positively influences diversification among small-scale farmers. Farming experience was positive and significantly related to income diversification at the 1% level. This suggests that experienced farmers have accumulated knowledge, skills, and networks that allow them to manage multiple sources of income effectively. Kamakaula, (2025) and Oyebanjo *et al.*, (2024) reported similar findings, indicating that farming experience enhances the ability of rural farmers to identify profitable opportunities and reduce the risks associated with diversified activities. Distance to farm was positive and significantly related to income diversification at the 5% level. Farmers who travel longer distances to access farmland were more likely to diversify income as a strategy to reduce dependence on a single source of livelihood and to spread risks associated with production and market uncertainties. This finding is supported by Namayengo *et al.*, (2023), who found that spatial constraints encourage diversification to mitigate production risks. Ownership of assets was positive and significant at the 5% level. Farmers possessing productive assets such as equipment, storage facilities, or irrigation systems were more likely to engage in multiple income-generating activities. Assets improve resource flexibility and creditworthiness, which facilitates investment in diversified enterprises. Ilesanmi *et al.*, (2024) reported similar results, demonstrating that asset-endowed households have higher diversification capacity. Cooperative membership was positive and significant at the 1% level, indicating that participation in farmer cooperatives enhanced income diversification. Cooperatives provide access to shared knowledge, financial support, and group resources, which enable farmers to venture into new livelihood activities. This finding agrees with Popoola *et al.*, (2023), who noted that cooperative participation is a strong driver of diversified farm and non-farm income among smallholder farmers.

For the comparison household group, the diagnostic tests indicate that the model also exhibited substantial explanatory power. The pseudo-R-square of 0.384 suggests that the included variables jointly explained 38% of the variation in the probability of income diversification among comparison farmers. The Wald chi-square value of 49.714, which was significant at the 1% level, indicates that the independent variables collectively exerted a statistically significant influence on income diversification. This confirms that the model is robust and appropriate for interpreting the factors affecting income diversification among comparison households. Age of respondents, marital status, level of education, farm size, farming experience, distance to farm, and cooperative membership were the significant variables that influenced the income diversifications of farmers in the comparison household in southeast Nigeria. Age of respondents was negative and significantly related to income diversification at the 5% level. This implies that as farmers grow older, they are less likely to engage in multiple sources of income. The reduction in physical strength, cautiousness in taking on new activities, and limited adaptability to innovative practices constrain older farmers from diversifying effectively. This finding



aligns with the studies of Jimoh *et al.*, (2024) and Leza, (2019) who reported that advancing age negatively impacts the ability of smallholder farmers to diversify their income sources. Marital status was positive and significantly related to income diversification at the 5% level. Married farmers were more likely to diversify income due to the availability of spousal labour and family support, which allows engagement in multiple agricultural and non-agricultural ventures. Level of education was positive and significant at the 1% level, indicating that educated farmers in comparison households were more likely to diversify their income sources. Education equips farmers with the knowledge and analytical skills required to identify and exploit alternative income opportunities beyond conventional crop farming. This result is consistent with Nawi and Saje (2025), who found that higher educational attainment increases the probability of diversified income activities among rural households. Farm size was positive and significantly related to income diversification at the 5% level. Larger farms provide more space for integrating multiple crops or livestock enterprises, allowing farmers to allocate resources efficiently across several ventures. Farming experience was positive and significantly related to income diversification at the 5% level. Farmers with longer experience possess practical knowledge, technical skills, and local networks that enable them to manage and coordinate multiple income-generating activities. This finding aligns with Isibor *et al* (2024), who observed that farming experience enhances the probability of engaging in diversified income sources. Distance to farm was positive and significant at the 5% level. Farmers traveling longer distances to access farmland are more likely to diversify their income to mitigate production risks and to compensate for logistical challenges associated with long travel. This is consistent with the findings of Wang *et al.*, (2023), who noted that spatial limitations encourage rural farmers to adopt multiple livelihood strategies. Farm size was positive and significantly related to income diversification at the 5% level. Larger farms provide space and resources for multiple enterprises, allowing farmers to allocate land efficiently for diversified income-generating activities. Cooperative membership was positive and significant at the 1% level. Membership in cooperatives enables access to information, pooled resources, and group support, which facilitates participation in various income-generating activities.

For the pooled model, the diagnostic tests demonstrate strong explanatory capacity. The pseudo-R-square of 0.447 indicates that the included variables jointly explained approximately 45% of the variation in income diversification among all sampled households. The Wald chi-square value of 72.826, significant at the 1% level, shows that the independent variables collectively exerted a statistically significant influence on the likelihood of farmers diversifying their income sources. This confirms that the model is robust, valid, and suitable for interpretation. Age of respondents, level of education, household size, farm size, farming experience, distance to farm, labour cost, cooperative membership, and microcredit use were the significant variables that influenced the likelihood of income diversification among all the farmers sampled for this study. Age of respondents was negative and significant at the 1% level. This indicates that as farmers grow older, their likelihood of diversifying their income sources decreases. Ageing farmers often face limitations in physical capacity and show lower willingness to engage in new ventures which restricts their ability to operate multiple income generating activities. Level of education was positive and significant at the 1% level. This shows that farmers with higher levels of education were more likely to diversify their income sources. Education increases awareness, enhances decision making skills, and enables farmers to identify and pursue viable economic opportunities beyond farming. Household size was positive and significant at the 5% level. This indicates that larger households had a higher likelihood of diversifying income. Larger families often require more financial resources which encourages the household to engage in multiple livelihood activities in order to meet their consumption needs. This finding is supported by the study of Isibor *et al.* (2024) who reported that household size is a strong driver of diversification in rural Nigeria. Farm size was positive and significant at the 1% level. This shows that households with larger farm holdings were more likely to diversify their income sources. Larger farms offer greater production possibilities and provide farmers with more flexibility to undertake additional enterprises that enhance income stability. Farming experience was positive and significant at the 1% level. This indicates that more experienced farmers had a higher likelihood of diversifying their sources of income. Experience improves farmers' understanding of market trends and production risks which encourages them to

spread their livelihood activities across different ventures. This result aligns with the conclusion of Akintunde *et al.* (2024) who found a significant positive effect of farming experience on diversification behaviour. Distance to farm was positive and significant at the 1% level. This suggests that farmers who travel longer distances to their farms were more likely to diversify their income sources. Long commuting distances introduce uncertainty and increase production costs which encourages farmers to engage in alternative income generating activities. This observation is similar to the findings of Wang *et al.* (2023) who reported that spatial constraints encourage diversification in rural households. Labour cost was negative and significant at the 10% level. This indicates that higher labour costs reduced the likelihood of income diversification among farming households. Elevated labour expenses increase production costs and reduce farmers' ability to allocate resources to additional livelihood activities. Cooperative membership was positive and significant at the 1% level. This shows that farmers who were part of cooperatives were more likely to diversify their income sources. Cooperative membership provides access to information, credit opportunities, and collective learning which encourages farmers to invest in additional livelihood activities. This finding agrees with the study of Popoola *et al.* (2023) who stated that cooperatives play a critical role in supporting the expansion of income options among rural farmers. Microcredit use was positive and significant at the 1% level. This indicates that access to microcredit significantly increased the likelihood of income diversification among farmers. Microcredit reduces financial constraints and provides the capital needed for farmers to undertake new enterprises that enhance income stability and resilience. This finding aligns with the work of Sakhani, *et al.* (2025), Oyebanjo *et al.*, (2024), Osunmakinde *et al.* (2024); Ilesanmi *et al.* (2024); Olayinka and Charles (2022) who showed that microcredit access strongly promotes diversification among rural farming households.

Table 2: Impact of Microcredit on the Diversification of Income Sources of Small-scale Farmers in Southeast Nigeria

Variables	Treated Households	Comparison Households	Pooled
Constant	1.6533 (2.874)***	1.2486 (2.316)**	1.7825 (3.127)***
Age of respondents	-0.0214 (-2.163)**	-0.0197 (-2.042)**	-0.0226 (-2.893)***
Marital Status	0.0076 (1.211)	0.0185 (2.648)***	0.0021 (0.832)
Level of Education	0.0432 (3.019)***	0.0389 (2.744)***	0.0407 (3.268)***
Sex of respondents	0.0051 (0.948)	0.0018 (0.622)	0.0044 (1.013)
Household Size	0.0217 (2.342)**	0.0093 (1.142)	0.0198 (2.026)**
Farm Size	0.0316 (2.566)**	0.0289 (2.583)**	0.0302 (2.712)***
Farming Experience	0.0381 (3.127)***	0.0337 (2.614)***	0.0366 (3.421)***
Distance to Farm	0.0456 (2.541)**	0.0092 (2.116)**	0.0441 (3.287)***
Labour Cost	-0.0027 (-1.124)	-0.0013 (-0.423)	-0.0148 (-1.986)*
Ownership of asset	0.0382 (2.344)**	0.0074 (1.112)	0.0081 (1.267)
Cooperative Membership	0.0291 (3.926)***	0.0265 (3.412)***	0.0376 (3.633)***
Microcredit Use			0.0423 (3.879)***
Pseudo R-square	0.421	0.384	0.447
Log Likelihood	-112.374	-126.587	-239.962
Wald Chi-square	56.382***	49.714***	72.826***
Number of Observations	180	180	360

Source: Field Survey Data, 2025.

Note: Asterisks ***, ** and * denote significance at 1%, 5%, and 10% levels respectively. Values in parentheses are z-values..

CONCLUSION AND RECOMMENDATION

The study concludes that microcredit helped beneficiaries to increase their level of income diversification compared to non-beneficiaries in southeast Nigeria. Also age of respondents, level of education, household size, farm size, farming experience, distance to farm, ownership of assets, and cooperative membership significantly influenced the income diversifications of beneficiaries in southeast Nigeria. In addition, age of respondents, marital status, level of education, farm size, farming



experience, distance to farm, and cooperative membership significantly influenced the income diversifications of farmers who did not benefit from microcredit in southeast Nigeria. Age of respondents, level of education, household size, farm size, farming experience, distance to farm, labour cost, cooperative membership, and microcredit use significantly influenced the likelihood of income diversification among all sampled farmers. These results suggest that both financial and structural factors jointly determine farmers' ability to diversify income sources.

- Microfinance institutions should expand outreach to rural farming communities and design credit products that are tailored to support both farm and non-farm income-generating activities.
- Government and development agencies should integrate microcredit programs with training in enterprise development, financial literacy, and livelihood planning to enhance effective income diversification.
- Policies that promote cooperative membership among small-scale farmers should be strengthened, as cooperatives enhance access to information, credit opportunities, and collective resources that support diversification.
- Educational and capacity-building programs should be intensified in rural areas to improve farmers' skills, adaptability, and ability to identify viable alternative income opportunities.
- Measures aimed at reducing labour costs and improving rural infrastructure should be prioritized to lower production constraints that limit diversification efforts.

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