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FINANCIAL INCLUSION OF URBAN AGRO-PROCESSORS: EFFECT OF CREDIT ON POVERTY STATUS OF ROASTED PLANTAIN VENDORS IN CALABAR, NIGERIA

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ABSTRACT

This study analysed the effect of credit on the poverty status of roasted plantain vendors in Calabar, Nigeria. The study described sources of credit, comparing the poverty status of credit recipients versus non-recipients, and the relationship between credit access and poverty index alongside the relationship between socioeconomic factors and poverty index. Data was collected from 110 randomly sampled roasted plantain vendors with the use of structured questionnaire. Poverty was measured with the Foster, Greer and Thorbecke (FGT) model class of weighted poverty measures. Descriptive statistics were used to examine poverty status, access to credit and the sociodemographic attributes of the roasted plantain vendors. Next, using descriptive statistics, the poverty status of the vendors who accessed credit was compared to those who did not access credit. Finally, the association between access to credit and poverty index was analyzed with logistic regression model while adjusting for the effects of sociodemographic factors. Descriptive statistics showed that 60% of the vendors were female, the average age was 35 years, and the average household size was four persons. Precisely, 91% of the roasted plantain vendors had completed primary or higher education. Exactly, 64.5% received credit, while 30.79% reported non-institutional lenders as sources of credit. The mean monthly income was N48,036.36 (US\$116.89). Poverty incidence was lower among credit recipients (0.268) compared to non-recipients (0.487). Credit access (OR = .083, $p < .01$) and household (OR=2.496, $p < .01$) had statistically significant associations with the poverty index. Policies promoting structural transformation are recommended for sustainable financial inclusion. An effective economic growth and development program, for example, will increase productive capacities and reduce capital losses, increase creditworthiness, motivate capital expansion and sustainable growth. Also, it was recommended that cooperative formation among the vendors is required. Membership of such a cooperative will increase credit access through reduced transaction cost, higher group's creditworthiness/borrowing experience and stronger negotiation capacity. A Nigerian economic transformation program to promote increased productive capacities and reduced capital losses is necessary for any financial inclusion policies to sustainably alleviate poverty among deprived agro-processors such as the roasted plantain vendors. Such programs will include financial literacy including banking and loan repayments, business innovations, and business plan development.

Key words: Credit, Financial inclusion, Micro-agro-processors, Plantain roasting, Poverty, Urban agriculture

INTRODUCTION

In Nigeria, poverty is on the rise as a significant proportion of the population still lives in extreme poverty, and the country ranks as the 3rd most impoverished nation in the world [1,2,4]. An estimated 54% (97.20 million) of Nigerians live below the poverty line [5]. The Human Development Index ranked Nigeria as 157th out of 189 in the world. In Nigeria, 10% of the wealthiest people control 43% of the national wealth, and the poverty gap is getting wider daily in the country. A more recent report showed that poverty headcount is 40.01%, poverty gap and poverty severity reading 12.85 and 5.63, respectively [5]. Estimates show that additional five million Nigerians became poor due to COVID-19 in 2020, with an increase in the poverty rate projected to be 90 million or 45% of the population in 2022 [6]. The poverty income threshold in Nigeria was \$3.20 per day in 2015 [2]. Hence, the poverty rate in Nigeria was much greater than in comparable developing countries such as Brazil (9.1%), Mexico (6.5%), Ecuador (9.7%) and Iran (3.1%) [6]. These countries are oil producing countries like Nigeria.

The Nigerian agricultural sector experiences disproportionate poverty rates. For example, in 2019, the poverty rate among farming male-headed rural households was 58.76%, in contrast to a poverty rate of 25.45% among non-farming male-headed rural household units [5]. The disproportionate impact of poverty indices in the rural farming sector has led to continual rural-urban migration of the active agricultural workforce. Worse still, a significant segment of the urban population is poor. Population growth in urban areas without commensurate economic growth has increased the poverty gap. The high-income disparity in Nigerian urban areas is comparable to that in its rural areas. For example, the Nigerian living standard survey of 2018-2019 shows that income inequality in the Nigerian urban sector (Gini coefficient = 31.94) was as high as income inequality in the Nigerian rural sector (Gini coefficient = 32.77) [5]. Moreover, poverty headcount in Nigerian urban areas fluctuated over the years (31.7% in 1985 and 30.4 in 1992). For example, poverty rates in four urban areas of Nigeria were high : Lagos (63.7%), Ibadan (62.1%), Kano (35.02%) and Onitsha (87%) in 1996 [7–9]. Although poverty rates dropped from 30.4% in 1985 [7–9] to 18.04% in 2019 [5], this small decline did not justify more than three decades of policies and programs of poverty reduction.

Recent data show that the poverty headcount in Nigerian urban areas is 30.11% among male-headed agrarian household units relative to 15.22% among non-farm male-headed urban household units [5]. These relatively high urban poverty rates may be due to increased participation of the poorest quintile in urban agriculture or related activities. For example, urban agriculture accounted for 30% of the income of the poorest quintile in Nigeria in 2010 compared to 20% in Malawi [10]. Hence, agriculture and related livelihood diversification strategies (such as agro-

processing and agro-trade) may play a significant role for the urban poor in Nigeria. Resources freed during self-production of agrifoods may be utilized to complement household diets by purchasing other nutritious food items such as fish, fruits and vegetables [11]. Moreover, continued growth in demand for value-added food due to increased urban population creates an incentive for poverty alleviation strategies in urban areas through agricultural-related livelihood [12].

Urban agro-processing is not playing its important role of poverty reduction because of inequity that exists in the distribution chains [12]. Studies have shown that limited capacity to manage the challenges associated with daily operations constitutes a major barrier to accessing agricultural credit [13–15]. Roasted plantain vendors suffer inadequacy of financial capital because of several factors that are interlinked and therefore difficult for them to manage. Such factors include: the high perishability of the raw materials (plantain), poor road network, inadequate means of transport from the plantain producing areas, poor planning, poor government policies on agricultural financing and the poor state of rural infrastructure. The intersection of these factors is associated with the inconsistent supply of raw materials for roasted plantain productions. Consequently, the vendors are unable to tap into sufficient opportunities in the roasted plantain market. The result is that, the roasted plantain vendors continue to wallow in poverty cycle of low capital, low supply, low productivity and low income [16]. In this study, the accessibility of credit by roasted plantain vendors in urban areas (Calabar) and its effect on their poverty status were examined.

Roasted plantain was selected for poverty analysis because of the high production potential, food security and economic values of plantain (*Musa paradisiaca*) in Nigeria [17–19]. The analyses were based on the experiences of roasted plantain vendors in Calabar, Cross River State, Nigeria. The state is one of the largest plantain producers in Nigeria. The specific objectives were to: i) identify the sources of credit accessed by roasted plantain vendors, ii) compare the poverty status of roasted plantain vendors with access to credit to those without iii) determine the effects of access to credit and their cofounding factors on the poverty status of roasted plantain vendors.

Economic importance of plantain production in Nigeria

Plantain is the crop-produce from which roasted plantain is produced among its several usefulness. Plantain (*Musa paradisiaca*) is one of the most important horticultural crops and it is among the ten most important food security crops that feed the world [20] and has always been an important staple food for both rural and urban populace. Plantain is a versatile food in the kitchen as well as a raw material for many popular delicacies and snacks [17, 21]. It is estimated that about 70 million people in west and central Africa derive more than 25% of the

carbohydrates from plantains, making it one of the most important sources of food energy throughout the African lowland humid forest zone [22]. Plantains have the potential to contribute to strengthening national food security and decreasing rural poverty [23].

Food production statistics of the Food and Agriculture Organization [24] indicates that Nigeria is one of the major producers of plantain in west and central Africa, but the *per capita* consumption for Nigeria is the lowest in the region, implying the existence of market potential for increased production in the country. Plantain production is profitable, contributes to food security and occupies a strategic position for rapid food production in Nigeria due to its short gestation period and low production cost [25]. Food and Agricultural Organization Statistics show that Nigeria is the sixth world largest producer of plantain, and contributes 7.5% of global plantain production [19]. Nigeria plantain production reached a peak of 3.12 million metric tons in 2021 out of a total worldwide production of 39,241,376 metric tons (Fig. 1). Nigeria is one among the top 13 plantain producers in the world alongside with the Democratic Republic of the Congo, Cameroon, Ghana, Colombia, Uganda, Philippines, Rwanda, Peru, Myanmar, Cote d'Ivoire, Guinea and Gabon [19].

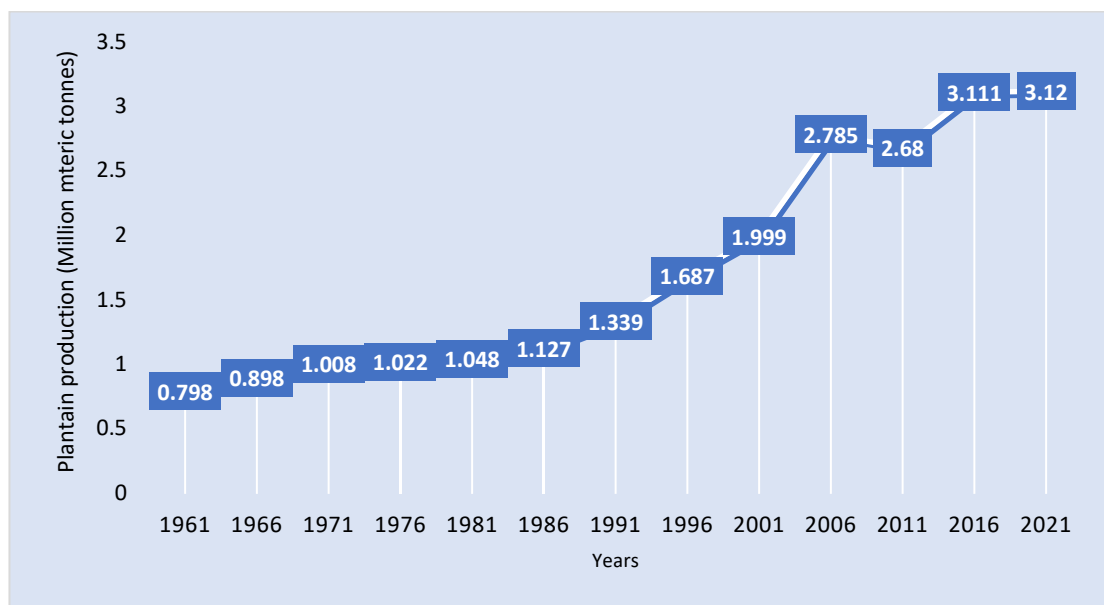


Figure 1: Statistics of plantain production (million metric tons) in Nigeria, 1961-2021

Sources: FAO statistical data [19], Knoema World Data Atlas [54]

Plantain production is principally done in southern regions of Nigeria, because of fertile forests, laterite soils and climatic conditions that favour plantain growth. Specific states within southern Nigeria known for high levels of plantain production are: Akwa-Ibom, Anambra, Benue, Cross River, Imo, Kwara, Enugu, Plateau, Kogi,

Rivers, Edo, Delta, Lagos, Ogun, Osun and Oyo [26]. Annual rainfall in these states exceeds 1,000 mm per year.

Plantains are very reliable sources of starch and energy; they contain a high amount of dietary fiber which helps ensure healthy bowels and reduce constipation. Roasted plantain also provides adequate levels of minerals such as iron, magnesium and phosphorus [27]. These minerals act as antioxidants and help build up the immune system by protecting the body against damage caused by free radicals. Magnesium for example, is essential for bone strengthening and has a cardiac-protective role as well [28]. Moreover, health experts have suggested that nutrients from unripe plantain help improve male fertility when taken in moderate amounts [29].

Theoretical framework

The study draws from the Theories of Poverty and those of Financial Inclusion. First, from these theories, it can be inferred that poverty status in agrarian populations (for example, among roasted plantain vendors) is a function of the intersection of behavioural [30], economic, social, political [31–33] and geographic factors [34]. Hence, the study is built around the theoretical ideas conforming to the notion that high poverty rates among the roasted plantain vendors are attributable to cumulative and cyclical interdependencies of factors [35], one of which is limited capital (inaccessibility of microcredit). The cumulative and cyclical views of poverty status are a relevant framework for this study because it highlights the individual situation and community resources as mutually interdependent, with a faltering economy. For example, creating individuals who lack resources to participate in the economy, making economic survival even harder for the community since people pay fewer taxes. Economic underdevelopment, in this case, is linked to the theory of interlocking, circular interdependence within a process of cumulative interdependencies of factors [35].

Financial inclusion is the provision of access to financial services to the population, particularly the poor and the other marginalised and vulnerable members of the population [36]. It also entails the delivery of banking services at an affordable cost to the vast sections of the disadvantaged and low-income groups [37]; and the use of and access to formal financial services [38]. Hence, a policy promoting financial inclusion should ensure accessibility of a full range of financial services to the public, financial institutions governed by regulation and performance standards, financial and institutional sustainability, choice, and affordability for clients. Financial inclusion is a coping strategy for individuals and micro enterprises in the poverty trap. For micro-agro-processors, for example, the roasted plantain vendors in Calabar-Nigeria, financial inclusion is a leverage for accessing financial capital in their quest for enterprise expansion, improved risk management, and ultimately,

poverty alleviation. Hence, of utmost relevance to this study is the Vulnerable Group Theory of Financial Inclusion. The theory postulates that financial inclusion programs in a country should target the vulnerable members of society who suffer the most from economic hardship and crises, such as poor people, youths, women and the elderly [39]. The rationale of this theory is that it is an appropriate approach to bring the poor, in this case, the micro agro-processors (roasted plantain vendors) into the formal financial sector, as they are among the enterprises worst hit by financial crises and economic recession. Also, small and micro agro-entrepreneurs, in general, need to be targeted for financial inclusion because of the dualistic problem [40], which is a feature of the Nigerian economy as in most developing economies. Dualism in the economy means that most micro agro-processors (including roasted plantain vendors) experience low productivity from the application of traditional techniques contrary to industrial enterprises known for high production efficiency based on their capacity to apply modern technology [41]. Hence, micro agro-processing enterprises need enhanced access to capital to upgrade their technology, improve their productivity and outputs for increased profits and poverty reduction.

MATERIALS AND METHODS

Study site

The study site was the Calabar metropolis. The metropolis includes Calabar South Local Government Area and Calabar Municipality in Cross River State, Nigeria. The city is adjacent to the Calabar and Great Kwa River and creeks of the Cross River (from its inland delta) [42]. It lies between latitudes 4.95° and 5.00°N of the Equator and on longitudes 8.30° and 8.37° E of the Greenwich meridian [55]. With annual population increase of over 4%, Calabar currently has estimated population of 684,876 [56], and a land area of 406 square kilometres [57]. Calabar is on the southern border of the Odukpani Local Government Area of Cross River State, Nigeria. To the North-East and West are the Great Kwa River and the Calabar River, respectively. To its Southern shores is the Atlantic Ocean. Calabar climate has two distinct seasons, the rainy and the dry seasons and relatively uniform temperatures, with a mean monthly average temperature of about 27.3°C. It lies in the coastal zone of Nigeria. Its shores are washed by tidal waves from the Atlantic, while the topography in the hinterland is undulating with numerous gullies, sheets and marine erosion. Although successive governments in the last two decades have invested in road developments, the city still has pockets of highly inaccessible hinterlands due to poor drainage systems and untarred roads. The soil is predominantly sandy loam; it is fertile and supports extensive farming. The average annual rainfall is 2750mm [43].

Calabar Municipality is a predominantly urban setting with few pockets of urban and semi-urban areas. In Calabar South, about 10% of the population lives in riverine areas, only accessible by boat, while 30% live in poor terrain only accessible by motorcycles and bicycles, which form about 85% of its transportation system. The Local Government Area is indigenous to Quas, Efuts and Efiks; most people identify as Christians. Most of the populace are public servants, businessmen, artisans, marketers of agricultural products (traders), and fishers. The dominant crops cultivated include cassava, vegetables, oil palm and plantain [44].

Calabar is one of Nigeria's largest producers of plantain, and roasted plantain, a local street food enjoyed in every part of Nigeria, a delicious and filling whole meal or snack. In Calabar Metropolis, roasted plantain has been upgraded from a regular street snack to the quintessential dish, prepared and served with other delicacies that blend to create the ultimate food combo. Generally, roadside vendors serve roasted plantains to their customers warm with other delicacies (avocado, roasted plums, beef kebabs, roasted fish). Roasted Plantain is often complemented with a special sauce, prepared with fresh pepper, fresh tomatoes, palm oil and local leaves ntong (*Ocimum gratissimum*) and otazi (*Gongronema latifolia*) with other spices. The vending of roasted plantain is a profitable activity for small agro-processors in Calabar Metropolis.

Study design

The study used a cross-sectional survey design. The sampling frame was all roasted plantain vendors in Calabar metropolis, while the study sample was 110 roasted plantain vendors randomly selected from a list of all vendors in the sampling frame. Data collection was done through the administration of structured questionnaires to the sampled roasted plantain vendors. Data collected with the questionnaires include the socio-economic characteristics, sources of credit and credit accessibility, constraints faced in accessing credit and determinants of poverty incidence.

Analytical framework

Descriptive and inferential statistics were used for data analysis. Descriptive analyses of credit sources and credit constraints were provided as reported by the roasted plantain vendors. Next, the Foster, Greer and Thorberke class of weighted poverty measures [45] were used to profile the poverty status of households. Finally, with the help of logistic regression analysis, the effect of credit on poverty status and other explanatory variables were estimated. Two-thirds (2/3) of the household *per capita* expenditure (PCE) was used as the benchmark for poverty line. Those who fell below the poverty line were said to be poor, but those who fell above the poverty line were said to be non-poor. The mean *per capita* household

expenditure (MPCHE) was obtained by dividing the total household *per capita* expenditure by the number of households surveyed.

$$PCE = \frac{TEX}{HHS}$$

Where: PCE = household *per capita* expenditure; TEX = Total expenditure; HHS = Household size

$$MPCHE = \frac{SPCE}{TNHS}$$

Where: MPCHE = Mean *per capita* household expenditure, SPCE = Sum of households *per capita* expenditure; TNHS = Total number of Households

According to the Foster, Greer and Thorberke model [45] which incorporates the headcount ratio P_0 , poverty gap ratio P_1 , and poverty severity P_2 ;

$$p_{a=i/n} \sum_{i=i}^q \left(\frac{z-y}{y} \right) \quad (1)$$

Where:

$$a = 0, P_0 = \frac{1}{n} \sum_{i=1}^q \left(\frac{z-y}{y} \right)^0 \quad \text{Poverty incidence or headcount} \quad (2)$$

$$a = 1, P_1 = \frac{1}{n} \sum_{i=1}^q \left(\frac{z-y}{y} \right)^1 \quad \text{Poverty gap or depth} \quad (3)$$

$$a = 2, P_2 = \frac{1}{n} \sum_{i=1}^q \left(\frac{z-y}{y} \right)^2 \quad \text{Poverty severity} \quad (4)$$

Where: n = total number of the sample under consideration; y = Daily *per capita* expenditure of the household; α = Takes a value of 0, 1, 2 for headcount, poverty gap and poverty severity; q = the number of sample household population below the poverty line; $z-y$ = The appropriate shortfall below the poverty line.

The logit regression model is specified as,

$$p_i = E \left(Y_i = \frac{1}{x} \right) = \frac{1}{1 + e^{-(\alpha + \beta x_i)}} \quad (5)$$

$$p_i = \frac{1}{1 + e^{-z_i}} \quad (6)$$

$$Z_i = B_1X_1 + B_2X_2 + \dots + B_8MX_8 \quad (7)$$

Where; p_1 is the cumulative logistics distribution function to obtain the value of z_i the likelihood of obtaining/observing the sample need to be formed by introducing dichotomous response variables (Y_i) such that $Y_i = 1$ if household is poor and 0 if otherwise (i.e., below poverty line =1; above or at poverty line =0); X_i = independent variable, $i = 1, 2, \dots, 8$, where X_1 = Credit access (1 accessed, 0 otherwise), X_2 = sex (1 if male, and 0 if otherwise), X_3 = Household size (Number), X_4 = Years of formal education, X_5 = Years of business experience (years), X_6 = income (Naira), X_7 = Membership to association (1 if yes, 0 if otherwise), X_8 = Age (years), α_i and β_i are constant term and logistic coefficient for independent variables. These variables have been used in other empirical analyses of determinants of poverty status among other households with agricultural based livelihoods, for example fluted pumpkin farmers [1].

RESULTS AND DISCUSSION

Socio-economic characteristics of the Roasted Plantain Vendors

As shown in Table 1, the average age (35.6 years) among vendors with access to credit was greater than in vendors with no access to credit (32.6 years). Among the group of vendors with access to credit, females (66.2%) were substantially more than males (33.8%) by a margin of (32.4%). Comparatively, among vendors without access to credit, females (51.3%) were greater than males (48.7%) by a much smaller margin (2.8%). The average household size was greater in households with access to credit (4 persons) than among vendors without access to credit (3.4 persons). Average years of formal education among vendors with access to credit (10.9 years) was about the same as those of vendors with no access to credit (11.3 years). Average years of business experience was greater in vendors with access to credit (4.4 years) than in vendors with no access to credit (3.77 years). Average monthly incomes were approximately equal in vendors with access ($m = 46,676.1$ Naira) and those without access (46756.8 Naira) to credit. Vendors who accessed credit were predominantly members of credit association (59.2%). In contrast, a larger majority of vendors with no access to credit (79.5%) were not members of the credit association. A large majority of vendors with access to credit (73.2%) were poor. In contrast, a smaller percentage of vendors without access to credit (48.7%) were poor. Finally, from table 1 it can be inferred that about two-thirds of the roasted plantain vendors (64.5%) had access to credit, while a little more than a third (35.5%) did not have access to credit.

Descriptive statistics of Credit-Related Factors

Figure 2 shows that among the vendors with access to credit, 47.9% received loan amounts ranging from 51,000 to 100,000 Naira. Precisely, 39.4% received loans of 50,000 Naira or less. The mean loan amount received was 70,985.90 Naira.

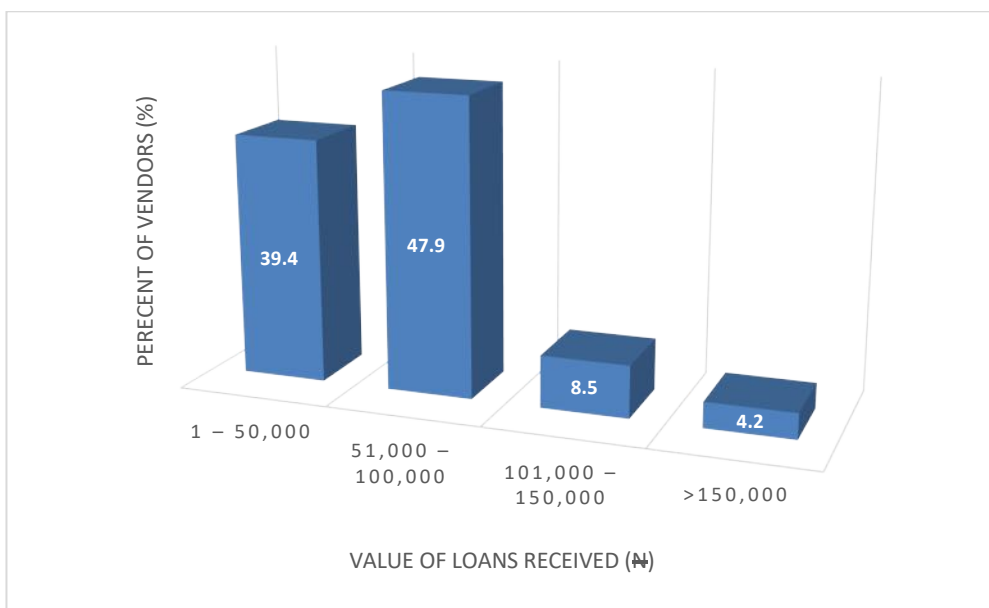


Figure 2: Percent of vendors (in access to credit group) by loans amounts obtained in the previous year

Figure 3 shows that non-institutional loan sources were reported by 30.79% of the vendors while 25.4% obtained their loans from co-operative societies. Another 18.3% and 14.1% financed their business through loans from Microfinance Bank and Rotating Saving Association. Small percentages: 5.6%, 4.2% and 1.41% of the vendors obtained their loans from Commercial Bank, Bank of Agriculture and Bank of Industry, respectively.

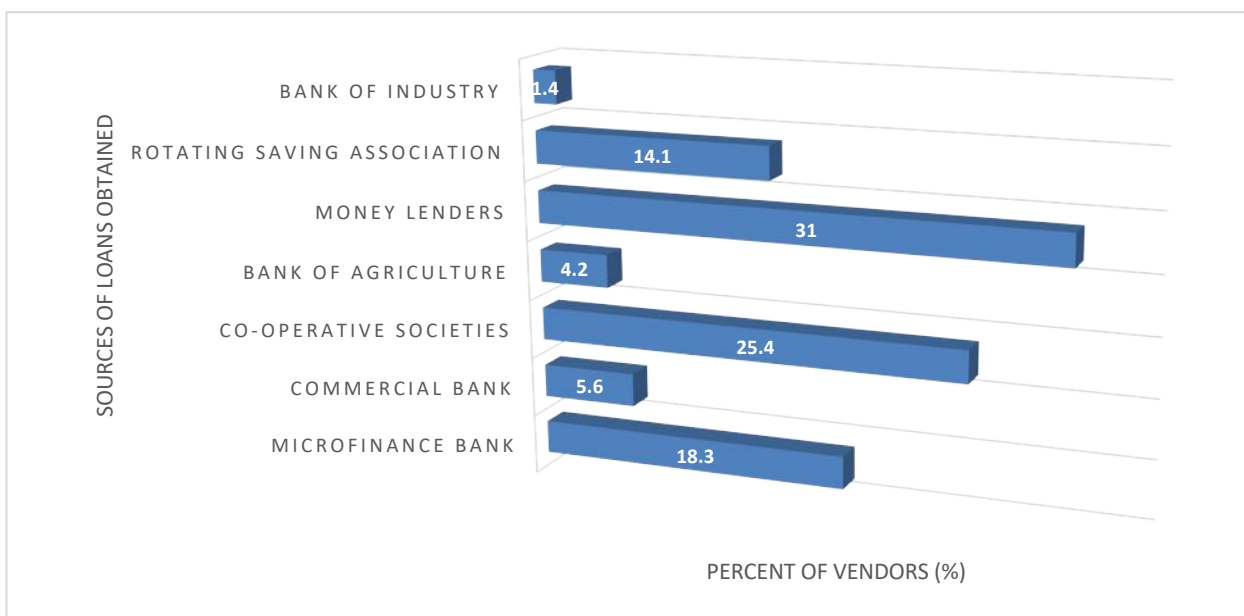


Figure 3: Percent of vendors (in access to credit group) by sources of loans obtained in the previous year

Results of Analysis of Poverty Status

Table 2 shows that mean *per capita* household expenditure was higher in vendors with access to credit (15,880.5 Naira) than vendors without (10,132.9 Naira). Vendors with access to credit had a higher share in total food expenditure (63.3%) and total non-food expenditure (73.8%). In contrast, vendors without access to credit made 36.7% and 26.2% of food and non-food expenditure values, respectively. Overall, vendors with credit had higher expenditures (67.6%) in all items than vendors without credit (32.4%).

Poverty incidence (Table 2) measured by headcount index was higher for the roasted plantain vendors who did not access credit (48.72%) compared to those who accessed credit (26.8%). The poverty depth for those who accessed credit was indicated by a poverty gap index of 0.06 (Table 2), implying that the poor fell below the poverty line by a margin of 6%. Therefore, the total amount required to alleviate a roasted plantain vendor with access to credit from poverty status will be 635.22 Naira. In contrast, the poverty depth for those with no access to credit was a poverty gap index of 0.18 (Table 2), implying that roasted plantain vendors with no access to credit fell below the poverty line by a margin of 18%. The total amount required to bring a roasted plantain vendor with no access to credit will be 1, 215.95 Naira. The poverty severities were indices of 0.02 and 0.08 (Table 2) for the group which accessed and the group which did not access credit, respectively. Hence, the margin of separation of the poor from the poverty line were 2% and 8% for vendors with credit access and those without, respectively. It also shows some level of inequality among the poor. The distance is smaller for the group which accesses credit. Poorer households are likely to use a more significant proportion of their credit resources for consumption purposes than the moderately poor.

Credit as a determinant of poverty status

The results shown in Table 3 present the determinants of poverty status among roasted plantain vendors in the study area. Given its output statistics ($X^2 = 44.134$, $p < .01$), the logistic regression model showed a good fit. That is, the independent variables included in the model significantly predicted the dependent variable (poverty status) in the logistic regression. The parameter estimates indicated that the logit (effect) coefficient of access to credit was a significant predictor of the odds of being poor or non-poor. Access to credit had a statistically significant negative effect on poverty status ($OR = .083$, $p < .01$), that is, the odd of poverty incidence was lower among vendors who accessed credit than among vendors who did not access credit. Among other factors, notably sociodemographic variables, the odds of poverty incidence were higher in vendors with larger households ($OR = 2.496$, $p < .01$). Moreover, being a male instead of a female roasted plantain vendor, education and business experience associated with

increased likelihood of belonging to non-poor group, howbeit at a non-statistically significant level.

The study showed that the odds of poverty incidence was lower among roasted plantain vendors with access to credit than among those with no access. This finding corroborates other poverty-related studies in Nigeria showing positive correlations between microcredit and poverty alleviation [46, 47]. Moreover, other studies indicate long-run relationships or causal effects of microcredits on poverty alleviation [48, 49]. A more recent study presents robust evidence that financial inclusion significantly reduces poverty rates in developing countries [50]. Financial inclusion reduces poverty incidence by providing access to investment capital and increasing consumption to boost economic activity. Also, increased access to credit due to financial inclusion will enable production efficiency, minimize capital cost, insure against short-term shocks, substantially improve daily financial management, and reduce exploitative norms of unregulated credit markets [51, 52].

CONCLUSION, AND RECOMMENDATIONS FOR DEVELOPMENT

Financial inclusion through eliminating credit constraints alleviates poverty incidence among agro- enterprises. Access to credit is a critical factor for growth and sustainability among micro-agro enterprises (for example, roasted plantain vending). Increased access to credit increases micro businesses' capital assets (for example, tools and technologies) needed for growth and expansion, which ultimately alleviates poverty. Therefore, a financial inclusion program that makes microcredit accessible to micro-agro entrepreneurs such as roasted plantain vendors is a viable recommendation. A public partnership initiative may be necessary as the commercial banks often cannot bear the social cost of lending to the poor. Also, the micro-agro entrepreneurs will have to agglomerate into moderate-sized thrift unions to make their borrowing from financial institutions easy and affordable. Access to financial services may not have as much direct effect on poverty reduction as it does through indirect effects by yielding greater production and labour efficiencies. Hence, a Nigerian economic transformation program to promote increased productive capacities and reduced capital losses is necessary for any financial inclusion policies to sustainably alleviate poverty among deprived agro-processors such as the roasted plantain vendors. Such programs will integrate financial literacy, business plan development and credit management.

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Data availability: The datasets analysed during the current study are available from the corresponding author on reasonable request.

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Ethics Approval: This is an observational study. The University of Calabar Research Ethics Committee does not require ethical approval for this study.

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

Table 1: Socioeconomic characteristics of the roasted plantain vendors with access versus no access to credit

Sociodemographic variables	Accessed credit	No credit access
Age in years (m [SD])	35.6 (7.7)	32.64 (7.16)
Gender (n [%])		
Female	47 (66.2)	20 (51.28)
Male	24 (33.8)	19 (48.72)
Household size (m [SD])	3.99 (1.7)	3.44 (1.55)
Years of formal education (m [SD])	10.85 (5.1)	11.28 (4.62)
Years of business experience (m [SD])	4.38 (2.2)	3.77 (2.85)
Monthly income in Naira (m [SD])	46676.1 (19505.2)	46756.76 (16854.62)
Membership of credit association (n [%])		
Member	42 (59.16)	8 (20.51)
Non-member	29 (40.84)	31 (79.49)
Poverty status (n [%])		
Poor	52 (73.24)	19 (48.72)
Non-poor	19 (26.76)	20 (51.28)
Total frequencies & percent (N [%])	71 (100)	39 (100)

Table 2: Measures of Poverty in Vendors with credit access versus those without

Measures of Poverty	Vendors with credit access	Vendors without credit access
Expenditure Share		
Mean per capital household expenditure, Naira	15880.5	10132.9
Share of total food expenditure, Naira (%)	29686.9 (63.3)	17230 (36.7)
Share of total non-food expenditure, Naira (%)	24088 (73.8)	8550 (26.2)
Between groups expenditure, Naira (%)	53774.9 (67.6)	25780 (32.4)
Poverty Status		
Headcount Index (P_0)	0.268	0.487
Poverty gap index (P_1)	0.06	0.18
Poverty severity (P_2)	0.02	0.08
Poverty line 2/3 of MPCHE	10587	6755.29

Table 3: Logistic regression results on the determinants of poverty status

Independent Variables	B	Standard error	OR Exp(B)	p-value
<u>Business related variables</u>				
Credit (Accessed =1, Otherwise =0)	-2.485	.671	.083	.000***
Income (Naira ₦)	.000	.000	1.000	.336
Years of business experience	-.015	.129	.985	.907
Association membership (Yes=1, No=0)	.889	.589	2.433	.131
<u>Sociodemographic variables</u>				
Age (years)	.013	.041	1.013	.750
Sex (male =1, female =0)	-.841	.566	.431	.137
Household size (number)	.915	.208	2.496	.000***
Years of formal education	-.049	.053	.952	.353
Constant	-2.072	1.325	.126	.118
Log likelihood				-97.675
X^2				44.134***
$P(X^2)$				.000
Nagelkerke R^2				0.46

*** = significance at 1% level

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