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Understanding Smallholders' Credit Behaviour: A Panacea for Poor Agricultural Production In Ogun State, Nigeria

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Abstract

Agricultural credit is vital for smallholder farmers' access to basic inputs that enhance agricultural production; however, there is a paucity of information on smallholder farmers' behaviour in obtaining agricultural credit. This study assessed the credit behaviour of smallholder farmers in the Ijebu-Ode agricultural zone, Ogun State, Nigeria. The respondents (n = 124) were selected using multistage sampling. Data were collected using structured questionnaires and analysed using descriptive and inferential statistics. We found that more than half of the farmers (58.9%) had bank accounts. Most respondents (67.7%) had never obtained formal credits, while 55.6% obtains informal credit annually. Most (77.4%) smallholders repay their loans on time, and 61.3% demonstrate favourable credit behaviour. The age (-0.054, $p < 0.10$) and educational level (1.047, $p < 0.10$) of farmers significantly influenced their credit behaviour. The choice (-0.058, $p<0.10$) and sources of agricultural credit (-0.406, $p<0.01$) were drivers of farmers' credit behaviour. The conclusion of this study is two-fold. Smallholder farmers are not favourably disposed toward formal credit, and their perceptions of agricultural credit sources significantly influence their credit behaviour. Similarly, farmers prefer informal sources of credit for their flexibility, trust, and accessibility. We recommend that innovative approaches to strengthening and consolidating the informal credit system among smallholder farmers receive high priority, and that formal lending institutions be restructured to be more farmer-centred to improve access to credit, as this is vital for enhancing agricultural production and food security in Nigeria.

Keywords: agricultural credit, credit behaviour, smallholder farmers, Nigeria

Comprendre le comportement des petits exploitants agricoles en matière de crédit : une panacée pour une production agricole insuffisante dans l'état d'Ogun, au Nigéria

Résumé

Le crédit agricole est essentiel pour permettre aux petits exploitants agricoles d'accéder aux intrants de base qui améliorent la production agricole. Cependant, on dispose de peu d'informations sur leur comportement en matière d'obtention de crédit. Cette étude a évalué le comportement des petits exploitants agricoles de la zone agricole d'Ijebu-Ode, dans l'État d'Ogun, au Nigéria, en matière de crédit. Les participants (n = 124) ont été sélectionnés selon une méthode d'échantillonnage à plusieurs degrés. Les données ont été recueillies à l'aide de questionnaires structurés et analysées par des statistiques descriptives et inférentielles. Nous avons constaté que plus de la moitié des agriculteurs (58,9 %) possédaient un compte bancaire. La plupart des personne intérrogées (67,7 %) n'avaient jamais obtenu de crédit formel, tandis que 55,6 % obtiennent un crédit informel chaque année. La plupart des petits exploitants (77,4 %) remboursent leurs prêts à temps et 61,3 % font preuve d'un comportement favorable en matière de crédit. L'âge (-0,054, $p < 0,10$) et le niveau d'instruction (1,047, $p < 0,10$) des agriculteurs influencent significativement leur

comportement en matière de crédit. Le choix (-0,058, $p < 0,10$) et les sources de crédit agricole (-0,406, $p < 0,01$) sont des facteurs déterminants de ce comportement. Cette étude aboutit à une double conclusion : les petits exploitants agricoles sont peu enclins à recourir au crédit formel, et leur perception des sources de crédit agricole influence fortement leur comportement en matière de crédit. Par ailleurs, ils privilégient les sources de crédit informelles pour leur flexibilité, la confiance qu'elles inspirent et leur accessibilité. Nous recommandons d'accorder une priorité élevée aux approches novatrices visant à renforcer et à consolider le système de crédit informel auprès des petits exploitants, et de restructurer les institutions de prêt formelles afin de mieux répondre aux besoins des agriculteurs et d'améliorer ainsi l'accès au crédit. Ceci est essentiel pour renforcer la production agricole et la sécurité alimentaire au Nigéria.

Mots-clés : crédit agricole, comportement en matière de crédit, petits exploitants agricoles, Nigéria

1.0 Introduction

Agriculture is an important component of the Nigerian economy, employing nearly 70% of the workforce and accounting for approximately 23% of GDP (Ikehi et al., 2020). Smallholder farmers account for more than 70% of total agricultural production and 80% of all farm enterprises, yet their crop and livestock production are not maximized. Agriculture in Nigeria is constrained by outdated technology, land tenure systems, and limited access to agricultural credit (Chiaka et al., 2022; Ijoma & Osondu, 2015). Credit is vital for smallholder farmers' access to the inputs needed for agricultural production. Inadequate access to credit for basic farm inputs leads to inefficient production systems and a shortfall in overall agricultural production (Simonyan et al., 2018). Agricultural credit encompasses funds borrowed through formal or informal channels such as loans from friends, trade credit, and bank credit, as well as seeds, fertilizers, tractor use, labour, and storage facilities on deferred-payment terms (Mgbakor et al., 2014). Agricultural credit, when appropriately utilized, enhances production, the uptake of new technologies, marketing efficiency, and the overall welfare of farmers (Ameh & Lee, 2022; Chaiya et al., 2023; Okafor, 2020).

In Nigeria, formal lending institutions in the agricultural sector include the Nigeria Agricultural Cooperative and Rural Development Bank and the Bank of Agriculture (Balana & Oyeyemi, 2022). Agricultural credit from formal sources is often unappealing and unavailable to smallholder farmers in Nigeria (Campero & Kaiser, 2013) due to stringent collateral requirements and high interest rates (Julien et al., 2021; Nouman et al., 2013). Limited access to formal credit, coupled with its complexity, has led farmers to rely on informal sources, despite their inherent limitations (Moahid & Maharjan, 2020; Oladeebo & Oladeebo, 2008).

In Nigeria, agricultural credit has been obtained primarily through formal and informal channels. The former often reflects a developmentalist view, in which the provision of formal credit and the adoption of modern farming technologies are seen as key drivers of economic growth. This approach treats agricultural credit and technology adoption as essential forms of capital required to increase productivity, scale up production, and contribute to overall economic development (Barrett, 2011; Sassi, 2014; World Bank, 2007). The latter, however, aligns with the sustainable livelihoods framework

and agrarian political economy, in which smallholder farmers are believed to be better off and more resilient if allowed to grow at their own pace and to depend on informal credit rooted in their social and indigenous knowledge systems, which can evolve over time. According to the developmentalist approach, credit is a tool for maximization and commercialization. It aligns with classical economic theory, which posits that the application of capital to fixed factors of production is crucial to agricultural development. However, this study recognizes that the pro-developmentalism agenda can have adverse, unintended consequences for smallholder farmers. Despite its widespread application and associated benefits, this approach can destabilize and lead farmers to become overly dependent on credit, finance, and subsidies (Nwafor et al., 2023). This dependency weakens their ability to repay loans, as agriculture is a high-risk sector vulnerable to unpredictable natural events. Moreover, the assumption that credit provision alone can drive sustainable agricultural growth fails to account for the complexity of local agricultural systems.

The factors mentioned above necessitate an examination of smallholder farmers' behaviour regarding the types and sources of agricultural credit, as well as the determinants of this behaviour. Previous studies have identified the influence of socioeconomic characteristics on credit accessibility (Elum & Obiajunwa, 2022; Fadaka & Okoh, 2019; Ukwuaba et al., 2020). Other studies have examined credit utilization, loan repayment performance, credit availability, sources of agricultural credit, and credit accessibility separately (Awotide et al., 2019; Elum & Obiajunwa, 2022; Etunim, 2020; Simonyan et al., 2019; Ukwuaba et al., 2020). However, there is a dearth of studies on the credit behaviour of smallholder farmers. Hence, this study examined the combination of key factors that influence smallholder farmers' behaviour toward credit. The behaviour exhibited by smallholder farmers when borrowing credit is explained by their varied actions, including the choice and source of credit, the frequency of borrowing, the allocation of borrowed funds, and the incidence of default and delayed repayment.[1]

Against this backdrop, this study ascertained smallholders' perspectives and the factors influencing their credit behaviour in the Ijebu Ode agricultural zone of Ogun State, Nigeria. The results are expected to stimulate consultations and support the enactment of policy frameworks for agricultural credit to enhance access for smallholder farmers. Additionally, it will help lenders recognize individual differences among smallholder farmers and how to accommodate their specific needs. Finally, the recommendations are expected to inform policymakers to drive actionable policies.

2.0 Literature Review

Available agricultural credit can enhance the effectiveness of other factors of production (Awotide et al., 2019; Ibitoye et al., 2015; Mmasa, 2017). Moreover, quantifying the direct impact of credit on smallholder farmers may be multifaceted (Chaiya et al., 2023; Yu et al., 2023). Socioeconomic factors can significantly influence farmers' choice of loan sources (Ameh & Lee, 2022). Interest rates and annual farm revenue influence access to loans, while education, farm size, farming experience, off-farm income, and farm income

[1] While this study focuses on economic and behavioural dimensions of credit access, it is important to acknowledge that farmers' credit behaviour is also shaped by broader social and political factors such as power relations, land tenure systems and governance structures, which are beyond the scope of this paper.

drive efficient loan use among smallholder farmers (Ameh & Lee, 2022). Additionally, (a) education, (b) gender, (c) credit awareness, (d) credit demand, (e) interest rate, (f) annual farm revenue, (g) formal education, (h) distance to formal credit sources, and (i) types of credit sources significantly influence credit accessibility among smallholder farmers in Nigeria (Ameh & Lee, 2022; Elum & Obiajunwa, 2022; Etonihu et al., 2013). Similarly, lengthy application procedures reduce the likelihood of credit demand among smallholder farmers (Mwonge & Naho, 2022).

Furthermore, the literature links credit constraints to supply-side factors, whereas demand-side factors also play crucial roles in credit rationing. This is often premised on risk minimization, as smallholder farmers tend to avoid unforeseen challenges that can create repayment problems. Unfavourable and high interest rates, information asymmetries, high collateral requirements, a lack of understanding of existing agricultural credit programmes, loan transaction costs, small amounts of credit granted to farmers, the inadequacy and untimeliness of credit, and complex procedural hassles from formal institutions pose significant challenges on the supply side of the credit market (Elum & Obiajunwa, 2022). These are consistent with various setbacks associated with developmentalism. Ameliorating supply-side constraints may not necessarily improve poor smallholders' access to credit without addressing credit access in ways that align with their socio-cultural characteristics within the context of the agrarian political economy. Understanding smallholders' credit behaviour and preferences is crucial for promoting a sustainable credit system that meets their needs and enhances resilient production systems.

3.0 Methodology

3.1 Study Area

The study area is located in Ogun State, southwestern Nigeria. The state comprises 20 local government areas and four agricultural zones (see Figure 1). According to the 2006 census, Ogun State has a population of 3,751,140, covering a total land area of 16,980.55 km². The state is geographically positioned between latitudes 6.2°N and 7.8°N and longitudes 3.0°E and 5.0°E. The climate is typically tropical, characterized by distinct wet and dry seasons. The dry season extends from November to March, while the rainy season lasts from April to October. Vegetation shifts from mangrove swamps in the southern coastal areas to rainforests in the central regions and to savannahs in the northern parts. Agriculture, supported by the prevailing climate, is the main occupation in Ogun State. Commonly grown crops include maize, yam, rice, plantain, beans, cocoa, rubber, oil palm, sugarcane, kola nut, citrus, and cassava. Proximity to markets in Lagos State and the Economic Community of West African States increases demand for the state's high-value food products, providing a comparative advantage for their export. Lending institutions, such as microfinance banks and cooperatives, exist but are unevenly distributed, thereby reinforcing farmers' reliance on informal credit. The dominant religions in the state are Islam and Christianity. However, a certain amount of traditional religion is practiced in the state (Oseni et al., 2019).

Figure 1. Description of the study area and its agricultural zones.

Source: Authors.

3.2 Sampling Procedure

The study population consisted of all arable crop farmers. The study's sampling procedure was based on the structure of the Ogun State Agricultural Development Programme (OGADEP), which stratifies the state into four agricultural zones (Abeokuta, Ikenne, Ilaro, and Ijebu-Ode). Each zone is further divided into blocks and circles to support extension services: there are twenty (20) blocks and one hundred and twenty-six (126) circles in the state.

The Ijebu-Ode zone comprises the Ogun Waterside, Ijebu-East, Ijebu-North, Ijebu-Ode, Odogbolu, and Ijebu-North East Local Government Areas. The Ijebu-Ode agricultural zone was purposively selected as the study location because of the preponderance of smallholder farmers and active cooperative societies, making it a representative setting for studying smallholders' credit behaviour. This zone comprises six blocks, namely Ago-Iwoye, Ala, Ijebu-Igbo, Ijebu-Ife, Isonyin, and Ibiade, each consisting of four, five, four, seven, six, and eight circles, respectively, totaling thirty-four (34) circles. A multistage sampling procedure was used to select the sample respondents. The first stage involved a simple random sample of 50% of ADP blocks (3 blocks out of 6). These were Ala, Ijebu-Ife, and Ijebu-Igbo. In the second stage, one circle from each block was randomly selected. In the third stage, 10% of farmers were randomly selected from each circle. A total of 124 respondents were sampled (see Table 1).

3.3 Statistical Analysis and Model Description

Primary data were collected from respondents using a structured questionnaire. Descriptive statistics, including frequencies, percentages, ranks, means, and standard deviations, were used to analyze the data. A binary logistic regression model was used to draw inferences about the determinants of credit behaviour among farmers.

Table 1. *Sampling Procedure and Sample Size Determination*

Selected Blocks	Number of circles	Selected circles	Number of farmers per circle	10% of farmers per circle
Ala	5	1	Ibefun – 640	64
Ijebu Igbo	4	1	Oduja – 360	36
Ijebu Ife	7	1	Imusin – 240	24
TOTAL	16	3	1240	124

3.4 Logistic Regression Model

In the binary logistic regression model of Gujarati and Porter (2009), the dependent variable takes two categorical values, typically coded as 0 or 1. In this study, the categorical dependent variable indicates whether respondents' credit behaviour is high (above the mean) or low (below the mean). The dependent variable is defined as follows:

$$\text{Logit}(Y_i) = \text{Ln (Odds)} = \frac{LnP}{1-P} = \alpha + \beta X_i \quad \text{......} (1)$$

Where: Y_i = dependent variable, X_i = explanatory variable, α and β are the parameters of the logistic regression.

Y_i= {1= if the respondent's credit behaviour is above the mean}

{0 = if the respondent's credit behaviour is below the mean}

X_i refers to respondents' age, religion, marital status, education, sources of agricultural credit, and choice of agricultural credit. The independent variables used as indicators in the empirical analysis are included to identify the factors that contribute to respondents' credit behaviour.

4.0 Results and Discussion

4.1 Socioeconomic Characteristics of the Respondents

More respondents were aged 41–50 years (37.1%), while the 21–30 age group had the lowest representation (4.8%; see Table 2). The mean age of respondents was 49.34 ± 9.81 years, confirming that most farmers were middle-aged, active, and productive. Credit institutions may provide credit facilities to younger farmers, who are more physically active and more likely to adopt newer technologies to enhance agricultural production than older farmers (Choudhury et al., 2022; Ramkumar et al., 2016). The gender distribution of respondents, as presented in Table 2, reveals that most farmers (66.1%) were male. This suggests that more males had the time and resilience to pursue and obtain agricultural credit to finance their activities. This finding aligns with those of Akinrotimi et

al. (2024), which indicate that male farmers accessed both formal and informal credit. Table 2 shows that the majority (66.1%) were Christians, 33.5% were Muslims, and very few (2.4%) were traditional worshippers. This finding that both Christianity and Islam were the predominant religions is consistent with prior studies indicating that Christianity and Islam were the major religions in southwestern Nigeria (Dowd, 2016).

Furthermore, the results show that the majority of farmers (84.7%) were married (see Table 2). Married individuals tend to have a greater need for agricultural credit to boost agricultural production and financial stability. Marriage carries prestige and signals accountability and responsibility among adults. This aligns with studies that found most respondents to be middle-aged and married (Adegboye, 2016; Elum & Obiajunwa, 2022). A high percentage of respondents (54%) had primary education, while 0.8% had tertiary education (Table 2). The results indicate that most farmers could read, write, and understand information related to farming and associated practices. This aligns with the findings of Awotide et al. (2019), which reported that most respondents had an average of six years of formal education.

Additionally, the results showed that 96.0% of respondents cultivated between 1 and 10 acres of farmland. The average farm size was 3.77 ± 3.91, indicating smallholding farms in the study area. This corroborates the findings of Ukwuaba et al. (2020), which indicate that most respondents had less than 10 acres of farmland. A larger farm size may increase the likelihood that farmers will seek additional credit to boost farm production. Most respondents (86.3%) engaged in manual, labour-intensive farming, as the majority were smallholder farmers without large farms to mechanize. Many respondents (66.1%) had less than 15 years of farming experience, while only a few (0.8%) had more than 45 years. Given that respondents had a mean farming experience of 15.17 ± 9.81 years, most had been farming for several years (Table 2). This suggests that farmers can provide information about their farming-related activities and experiences, which can be helpful when sourcing credit. This finding aligns with the study by Fadaka and Okoh (2019), which reported a mean farming experience of 15 years. The results in Table 2 reveal that 58.9% of respondents have bank accounts, making them more likely to obtain credit and loans from financial institutions than those without a bank account. This is corroborated by the findings of Ugwuja and Attah (2020), which revealed that 50% of farmers had bank accounts.

Table 2. *Socio-economic Characteristics of the Respondents*

Variables	**Categories**	**Frequency**	**%**	**Mean±SD**
Age	21-30	6	4.8	49.34±9.81
	31-40	19	15.3	
	41-50	46	37.1	
	51-60	38	30.6	
	61-70	15	12.2	
Gender	Male	82	66.1	
	Female	42	33.9	

Table 2 continued

Religion	Christian	82	66.1	
	Muslim	39	31.5	
	Traditional	3	2.4	
Marital Status	Single	7	5.6	
	Married	105	84.7	
	Divorced	11	8.9	
	Widowed	1	0.8	
Level of Education	No formal Education	14	11.3	
	Primary Education	67	54.0	
	Secondary Education	42	33.9	
	Tertiary Education	1	0.8	
Family Size	2–6	87	70.2	5.77±1.86
	7–11	35	28.2	
	12–16	2	1.6	
Farm Size (acres)	1–10	119	96.0	3.77±3.91
	11–20	4	3.2	
	21–30	0	0	
	31–40	1	0.8	
Mode of Farming	Manual	107	86.3	
	Mechanized	17	13.7	
Years of Farming Experience	Less than 15	82	66.1	15.17±9.81
	16–25	25	20.2	
	26–35	12	9.7	
	36–45	4	3.2	
	Above 45	1	0.8	
Do you have a Bank Account?	No	51	41.1	
	Yes	73	58.9	

4.2 Sources of Agricultural Credit

Results from Figures 2 and 3 show the distribution of respondents by the sources of agricultural credit they had access to. Under the formal sources of credit (see Figure 2), only 14.5%, 16.9%, 15.3%, 20.2%, 27.4%, and 20.2% of respondents benefited from the Nigerian Agricultural Cooperative and Rural Development Bank (Now BOA but referenced as NACRB by older respondents), commercial banks, cooperative societies, the Bank of Agriculture, microfinance banks, and the Anchor Borrowers Programme, respectively. Thus, only a few respondents accessed and benefited from these institutions as formal sources of credit. These few beneficiaries may be among the majority with bank accounts, as institutions may be more willing to lend to them. Additionally, low levels of education among farmers and the stress of securing loans hindered access for those who did not benefit from these formal sources. This aligns with the findings of Jan et al. (2012), who reported that most deserving farmers in Pakistan were unable to access credit through the programmes. Most farmers noted that the cumbersome qualifying process was the primary hurdle to obtaining formal credit. However, farmers appear to obtain credit readily from informal sources (see Figure 3), including relatives (76.6%), friends (71.0%), moneylenders (58.1%), savings societies (76.6%), and produce buyers (58.1%). This is because of the close, physical connection and trust, which encourages them to give credit. Indeed, farmers prefer informal sources of credit to formal ones, consistent with the finding that 48.75% of rice farmers obtained loans from informal sources. Furthermore, the extensive use of informal sources has been associated with lower interest rates and fewer collateral requirements (Ameh & Lee, 2022). This gives credence to the informal credit system as a model that works better for smallholders, and it is important that this model is improved and up-scaled as efforts are directed toward improving access to credit for smallholder farmers.

Figure 2. Access to formal sources of credit.

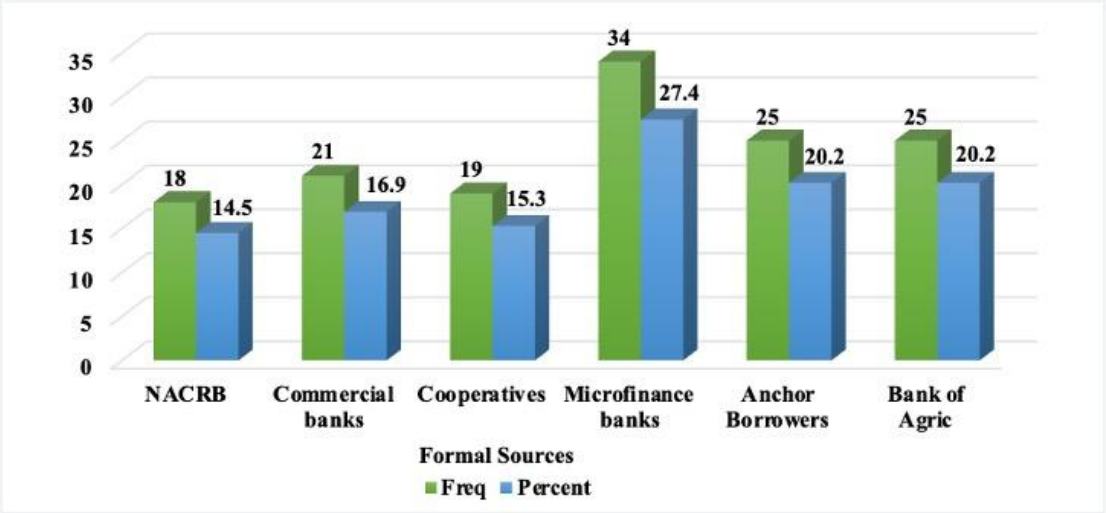
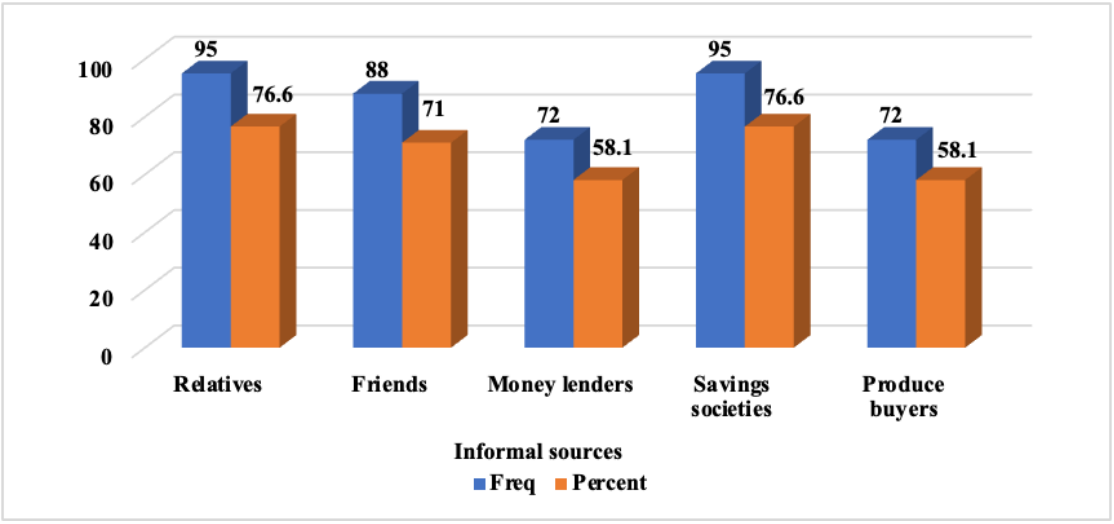


Figure 3. Access to informal sources of credit.



4.3 Availability of Agricultural Credit Sources

Findings from Figure 4 indicate that farmers more frequently used informal credit than formal credit. Among formal sources, credit facilities from microfinance banks were most available (43.5%), while those from the Nigerian Agricultural Cooperative and Rural Development Bank were least available (6.5%). This may be because some microfinance banks are located in rural areas and have agents who are well-connected to farmers and can readily address their credit needs, rather than through formal credit sources. Under the informal credit source in Figure 5, respondents indicated that obtaining credit from savings societies was most likely (84.7%), whereas obtaining credit from produce buyers was least likely (65.3%). Farmers may form savings groups to support one another financially. High patronage of savings societies by farmers can be attributed to earlier access to the societies and the credit they have obtained through them. This finding aligns with that of Onyishi et al. (2022), who found that informal credit facilities were readily available to farmers in rural areas of Southwest Nigeria. This is because respondents are smallholders, and most do not meet the statutory requirements, meet the interest rate criteria, or undergo the rigorous credit application process for formal sources.

Figure 4. Availability of formal sources of credit.

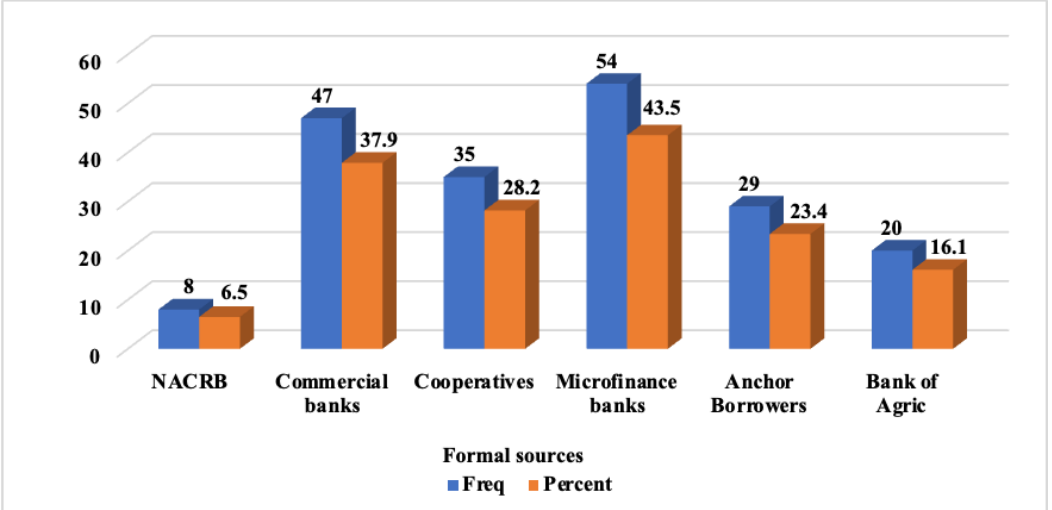
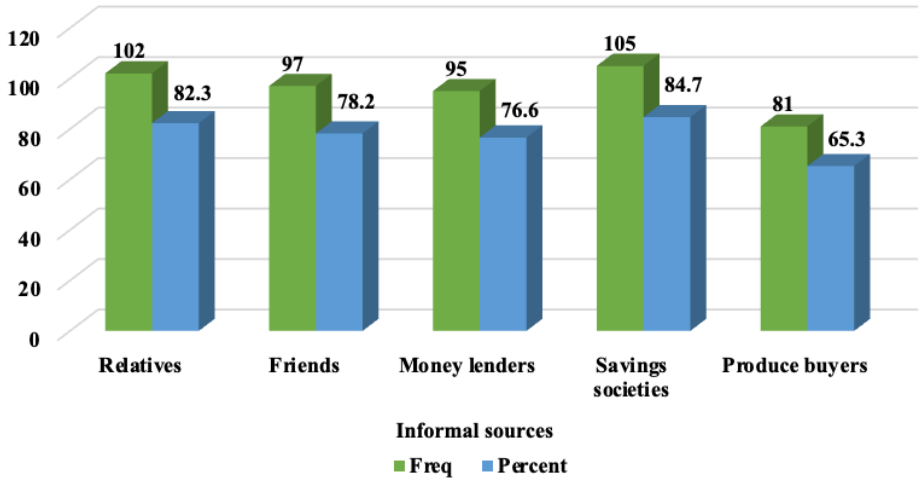


Figure 5. Availability of informal sources of credit.



4.4 Factors Informing Farmers' Decision to Explore Credit Facilities

Results in Table 3 show that insufficient funds for current farming production needs ranked first ($\bar{x}$=0.76), desire to expand the scale of farming operation ranked second ($\bar{x}$=0.74) while social network pressure ranked sixth ($\bar{x}$=0.42). Due to the time-bound nature of agriculture, insufficient funds put pressure on smallholder farmers to seek credit to ensure their farming activities run smoothly during the season. The agricultural sector is credit-dependent because of the seasonality of farm production. As a result, smallholder farmers seek credit to meet the demands of each new season's work. This credit is necessary to obtain inputs such as fertilizers, insecticides, and pesticides, ensuring that every stage of production proceeds smoothly and that delays do not occur. Also, farmers' desire to expand their current farming operations can drive them to seek credit facilities. Scaling up production requires credit to acquire more inputs, which can be coupled with other factors of production, resulting in increased output.

Table 3. *Distribution of Respondents by the Factors Informing Their Decision to Explore Credit Facilities*

Factors	A factor freq (%)	Not a factor freq (%)	Mean	Rank
Low level of agricultural output	86 (69.4)	38 (30.6)	0.69	3rd
Inadequate funds to meet daily personal and family needs	84 (67.7)	40 (32.3)	0.67	4th
Desire to expand the scale of the farming operation	92 (74.2)	32 (25.8)	0.74	2nd
Recommendation from people	75 (60.5)	49 (39.5)	0.60	5th
Social network pressure	52 (41.9)	72 (58.1)	0.42	6th
Insufficient funds to meet current farming production needs	94 (75.8)	30 (24.2)	0.76	1st

4.5 Constraints Associated with Accessing Credit

Table 4 shows that the constraints in accessing formal credit were a delay in the approval of loans by lenders ($\bar{x}$=1.75) and lack of connection of borrowers with influential people ($\bar{x}$=1.53), which ranked first and second, respectively. However, limited sources of information on the credit facility ($\bar{x}$=0.95) and gender bias in disbursing credit ($\bar{x}$=0.70) were the least perceived constraints, ranking fourteenth and fifteenth, respectively. Poor weather conditions, including drought, flooding, pest infestations, disease and fire outbreaks, among others, can affect production in a given season and result in significant losses. These situations pose a high risk for lenders and may cause them to delay approving credit for farmers or even decide not to extend credit. Lenders might be reluctant to take risks in such cases. This finding aligns with studies that have identified delays in the approval and disbursement of credit to farmers as a significant constraint (Adebayo et al., 2018; Ukwuaba et al., 2020). This finding attests to the complexity of developmentalism as a model, in which credit is idealized as a driver of agricultural development, yet the disbursement approach is hampered by challenges that fail to address the practical needs of smallholder farmers.

Table 4. *Distribution of Respondents by Constraints Associated with Accessing Formal and Informal Credit Facilities*

Constraints	**Mean (formal)**	**Rank (formal)**	**Mean (informal)**	**Rank (informal)**
Limited source of information on the credit facility	0.95	14th	0.95	1st
Gender bias of lenders in disbursing credit	0.70	15th	0.56	12th
Lender's consideration of the level of educational attainment	0.99	13th	0.55	13th
Lack of collateral	1.25	11th	0.5	14th
Stressful application procedure	1.09	12th	0.58	11th
Limited financial capacity of lenders	1.29	10th	0.89	4th
High cost of application fees (obtaining forms, printing documents, etc.)	1.42	7th	0.71	8th
Delay in the approval of the loan by the lenders	1.75	1st	0.79	6th
Bad reputation or poor credit history of borrowers	1.43	6th	0.8	5th

Table 4 continued

Lack of connection of borrowers with influential people	1.53	2nd	0.92	2nd
High-interest rate	1.34	9th	0.44	15th
Lender's unwillingness to take risks	1.50	3rd	0.73	7th
Unavailability of a guarantor for borrowers	1.45	4th	0.91	3rd
Lender's preference for large-scale farmers over smallholder farmers	1.37	8th	0.61	10th
Lack of trust for borrowers by the lender	1.44	5th	0.66	9th

Furthermore, the most prominent constraints respondents faced in obtaining credit from informal sources were limited sources of information on credit facilities ($\bar{x}$=0.95), lack of connection between borrowers and influential people ($\bar{x}$=0.92), and the unavailability of a guarantor for borrowers ($\bar{x}$=0.91) ranking first, second and third respectively. However, a lack of collateral ($\bar{x}$=0.50) and a high interest rate ($\bar{x}$=0.44) were the least perceived constraints, ranking fourteenth and fifteenth, respectively. The seasonal nature of agriculture, farm size, and the farmer's past record of credit borrowing are among the factors a prospective guarantor might consider before agreeing to stand as surety for a farmer. These findings are consistent with studies that identified similar challenges in farmers' access to agricultural credit (Simonyan et al., 2019).

4.6 Credit Behaviour of Respondents

4.6.1. Loan frequency. Table 5 shows that 67.7% of respondents never received formal credit. Conversely, more than half of respondents (55.6%) obtained informal credit annually to support their farming activities. This is because the informal credit process is less cumbersome, corroborating findings that smallholder farmers rely on informal sources for agricultural credit (Ameh & Lee, 2022). This indicates that the credit access landscape among smallholders is far more attuned to the informal sector than to the formal sector, which aligns with the findings of Ping et al. (2022) that most farm households (97.1%) prefer informal credit sources over formal ones. This reveals that informal credit sources are more convenient and accessible to smallholder farmers than formal sources, which are often linked to developmentalist projects/programmes. Hence, efforts to strengthen and upgrade informal credit sources will be very helpful. This is a viable pathway that is rarely considered and deserves attention in the search for a sustainable credit model among smallholders.

Furthermore, 52.4% of respondents regularly inquired about credit from family and friends, 71.8% recognized the need for credit, and 62.1% always attended credit-sourcing meetings. In addition, 45.2% sometimes received referrals for credit sourcing from family and friends. Thus, farmers are interested in credit sourcing, as they frequently inquire about it. This may keep them better informed about when and where to receive credit.

Table 5. *Distribution of Respondents Based on Loan Frequency*

	Never freq (%)	**Bi-annual freq (%)**	**Annual freq (%)**	**Biennial freq (%)**
How often do you obtain formal credit?	84(67.7)	3 (2.4)	34 (27.4)	3 (2.4)
How often do you obtain informal credit?	42 (33.9)	8 (6.5)	69 (55.6)	5 (4.0)
How often do you attempt to obtain formal credit?	42 (33.9)	8 (6.5)	69 (55.6)	5 (4.0)
How often do you attempt to obtain informal credit?	15 (12.1)	67 (54.0)	32 (25.8)	10 (8.1)
How often do you visit financial institutions to source credit?	45 (36.3)	5 (4.0)	70 (56.5)	4 (3.2)
	Never	**Rarely**	**Sometimes**	**Always**
How often do you make enquiries about credit sourcing from family and friends?	20 (16.1)	3 (2.4)	36 (29.0)	65 (52.4)
How often do you engage in discussions about credit sourcing?	20 (16.1)	5 (4.0)	21 (16.9)	78 (62.9)
How often do you encourage others to seek credit?	18 (14.5)	10 (8.1)	37 (29.8)	59 (47.6)
How often do you attend meetings about credit sourcing?	8 (6.5)	5 (4.0)	34 (27.4)	77 (62.1)
How often do you recognize the need for credit?	3 (2.4)	18 (14.5)	14 (11.3)	89 (71.8)
How often do you get referrals for credit sourcing from family and friends?	10 (8.1)	12 (9.7)	56 (45.2)	46 (37.1)

4.6.2. Loan repayment performance. According to the results presented in Table 6, 77.4% of respondents consistently repay their loans on time, and 70.2% willingly repay them without being compelled[2]. While compulsion, as used in this informal credit system, does not necessarily mean the use of force, it may refer to the strategy that takes advantage of the social structure within which the borrowers operate to hasten them to repay promptly such as reaching out to relatives, friends, religious and community leaders. Several respondents (62.1%) agreed that production failures due to climate change, pest infestations, and natural disasters affect their ability to repay on the due date. In comparison, 73.4% repay even if they are unable to achieve the desired results or productivity on their farms. The majority of respondents genuinely wanted to borrow and repay loans, while a few attempted to abscond or deliberately delay repayment. The majority of farmers will promptly repay the borrowed credit, as prompt repayment builds credibility and trust and enhances their chances of obtaining credit in the future. This finding is consistent with findings indicating a mean loan repayment performance of 80% across all credit sources used by farmers. Furthermore, it revealed that farmers' socioeconomic characteristics influence their loan repayment performance. The results also showed that the majority of farmers paid their loans on time (Etunim, 2020).

Table 6. *Distribution of Respondents on Loan Repayment Performance*

	Never freq (%)	**Sometimes freq (%)**	**Always freq (%)**
I repay my loans at the stipulated time	6 (4.8)	22 (17.8)	96 (77.4)
I deliberately delay the repayment of my loans	109(87.9)	11 (8.9)	4 (3.2)
I willingly repay my loans without being compelled	9 (7.2)	28 (22.6)	87 (70.2)
I repay my loans with the help of friends and family members	69 (55.7)	52 (41.9)	3 (2.4)
I repay my loans after being reprimanded	89 (71.7)	25 (20.2)	10 (8.1)
I generate enough income to repay my loan adequately	21 (16.9)	60 (48.4)	43 (34.7)
I get anxious when the next date for loan repayment is approaching	41 (33.1)	74 (59.7)	9 (7.2)
I don't repay my loan if I am unable to get the desired result or productivity from my farm	91 (73.4)	28 (22.6)	5 (4.0)
I feel bad if I fail to repay on a due date	23 (18.6)	20 (16.1)	81 (65.3)
I repay my loan on the due date because my friends and family members encourage me to do so	34 (27.4)	65 (52.4)	25 (20.2)

[2] 'Being compelled' in this context refers to social and reputational pressures exerted or applied by lenders, cooperatives or community leaders, and not necessarily physical force in all cases (Simonyan et al., 2019; Ameh & Lee, 2022).

Table 6 continued

Fear of embarrassment makes me repay my credit on the due date	29 (23.4)	28 (22.6)	67 (54.0)
I abscond from home when it is time to repay my loan	102 (82.2)	12 (9.7)	10 (8.1)
Production failure due to climate change, pest infestation and natural disasters affects my ability to repay on due date	36 (29.0)	77 (62.1)	11 (8.9)

4.6.3. Choice of agricultural credit. Table 7 shows that most respondents hold a negative perception of formal credit because borrowing costs are unfavourable (87.1%). A majority (88.7%) do not use formal credit because the application process is stressful, whereas most (69.4%) use informal credit because the lender is better informed about their circumstances and relates to them on a personal basis. A high percentage of respondents (83.9%) dislike using formal credit because the loan processing period is too long. The majority (81.5%) do not use formal credit due to fear of property seizure for default in repayment, and most (92.7%) prefer informal credit because it is flexible. This suggests that most respondents prefer informal credit sources. This may be attributed to several factors, including the flexibility of informal credit systems, relaxed documentation procedures, and the absence of collateral requirements. It shows that smallholders are rational and choose to avoid the high risk of failure associated with formal credit sources. This aligns with findings from studies that attribute the preference for and high use of informal credit sources to lower interest rates and the absence of collateral requirements (Ping et al., 2022). However, some respondents prefer formal credit sources because the amounts obtained from informal lenders are too small to have a meaningful impact on their businesses (62.9%).

Table 7. *Distribution of Respondents on Choice of Agricultural Credit*

	Yes freq (%)	**No freq (%)**
I like using formal credit because the cost of borrowing is relatively lower	16 (12.9)	108(87.1)
I do not make use of formal credit because the application process is stressful	14 (11.3)	110(88.7)
I make use of formal credit because I can obtain a large sum of money	60 (48.4)	64 (51.6)
I do not like using formal credit because the loan processing period takes too long	104 (83.9)	20 (16.1)
I make use of formal credit because there is no exploitation by the lender	40 (32.3)	84 (67.7)
I do not make use of formal credit because it requires heavy collateral	109 (87.9)	15 (12.1)

Table 7 continued

I use formal credit because it has already stipulated procedures	62 (50.0)	62 (50.0)
I do not make use of formal credit for fear of having my property seized due to default in repayment	101 (81.5)	23 (18.5)
I like using formal credit because it provides everyone, including smallholder farmers, with access to credit.	84 (67.7)	40 (32.3)
I don't like making use of formal credit because of its strict monitoring and enforcement procedures	75 (60.5)	49 (39.5)
I make use of formal credit because the lender has no personal knowledge of me	91 (73.4)	33 (26.6)
I do not make use of formal credit because it has no regard for social ties and relationships	75 (60.5)	49 (39.5)
I like using informal credit because it is flexible	115 (92.7)	9 (7.3)
I make use of informal credit because it requires lower collateral	105 (84.7)	19 (15.3)
I do not like using informal credit for fear of being embarrassed by the lender	94 (75.8)	30 (24.2)
I use informal credit because it is available in my immediate vicinity	113 (91.1)	11 (8.9)
I make use of informal credit because the lender is better informed about my circumstances and relates with me on a personal basis	38 (30.6)	86 (69.4)
I do not use informal credit because of irregularity in operational procedures	62 (50.0)	62 (50.0)
I make use of informal credit because I find it easy to repay	114 (91.9)	10 (8.1)
I use informal credit because it does not require strict documentation	115 (92.7)	9 (7.3)
I use informal credit because it regards social ties and relationships	84 (67.7)	40 (32.3)
I like using informal credit because it has a quick processing period	115 (92.7)	9 (7.3)
I don't use informal credit because it makes me appear vulnerable to the lender	52 (41.9)	72 (58.1)
I do not make use of informal credit because the amount is too small to meet my production needs	46 (37.1)	78 (62.9)

Table 7 continued

I use both credit types because they complement each other	85 (68.5)	39 (31.5)
I do not use any credit type because I do not like debt	40 (32.3)	84 (67.7)
I use neither formal nor informal credit to avoid embarrassment from lenders	39 (31.5)	85 (68.5)
I like using both credit types because I am not afraid of taking risks	78 (62.9)	46 (37.1)
I use neither formal nor informal credit because I cannot pay any interest on the loan	53 (42.7)	71 (57.3)
I use both credit types because I need as much financial support as I can get	71 (57.3)	53 (42.7)
I do not use any credit type because I cannot go through stress of any kind	47 (37.9)	77 (62.1)
I do not use any credit type because I will not be able to repay	49 (39.5)	75 (60.5)
I use both formal and informal credit types because I have a good credit history	90 (72.6)	34 (27.4)
I make use of both credit types because I have the requirements to obtain both	86 (69.0)	38 (30.6)
I like using both credit types because I strongly want to achieve maximum agricultural productivity	98 (79.0)	26 (21.0)
I do not like using any credit type because I do not like being at the mercy of lenders	13 (10.5)	111(89.5)

4.7 Categorization of Credit Behaviour Among Farmers

Table 8 shows that 61.3% of respondents had scores at or above the mean ($\overline{x}$= 32.9), while 38.7% had scores below the mean ($\overline{x}$= 32.9). Respondents with scores below the mean were categorized as having unfavourable credit behaviour. In contrast, those with scores at or above the mean were categorized as having favourable credit behaviour. The results indicate that most respondents exhibited favourable credit behaviour.

Table 8. *Categorization of Farmers' Credit Behaviour*

Credit behaviour	**Freq.**	**%**	**Minimum**	**Maximum**	**Mean**	**SD**
Favourable (32.9–55)	76	61.3	1.00	55.0	32.9	7.5
Unfavourable (1–32.8)	48	38.7				

4.8 Determinants of Credit Behaviour

In this study, the drivers of credit behaviour among respondents were estimated using a binary logit model. The Omnibus test, Cox & Snell R2, Nagelkerke R2, and percentage of correct classification for the logit model are shown in Table 9. The Omnibus test measures the model's goodness of fit. The model shows goodness of fit at the 1% level, with a chi-square statistic of 57.873 ($p < 0.01$). The values of Cox & Snell R2 and Nagelkerke R2 indicate the strength of the relationship between the predictors and the predicted outcome. The value of Nagelkerke R2 is usually greater than the value of Cox & Snell R2.

The results of the Logit model are shown in Table 9. The statistically significant variables include respondents' age, religion, marital status, education, sources of information, and the agricultural credit they have benefited from. The model results are presented as odds ratios. As farmers age, their credit behaviour tends to decline (0.948, $p<0.1$). Hence, as a farmer's age progresses, he or she becomes less willing to take risks associated with credit. This could extend beyond conservatism and serve as a response to prior experiences of loan failures. Various interventions and programmes that raised hopes for credit but failed to materialize could instill apathy toward formal credit for smallholder farmers. In addition, family and domestic responsibilities could force farmers to weigh the costs of taking credit against its consequences, such as the inability to repay due to other financial commitments. This corroborates findings that older farmers have lower chances of accessing credit, which can be attributed to their risk-averse nature (Awotide et al., 2019; Fadaka & Okoh, 2019).

Furthermore, when respondents' commitment to religion increases by one unit ($p < 0.05$), the probability that farmers take credit and repay increases by a factor of 4.470. This clearly shows that the socio system within which smallholders operate influences their credit behaviour, and this further endears them to informal credit systems that integrate better within their socio-cultural milieu. The results indicate that the teachings and tenets of religion largely govern actions and behaviours. This corroborates Daas (2019), who, in a study on how religion affects consumer behaviour, reports that religion comprises the values, principles, opinions, choices, and behaviour of people. While marriage (0.190, $p < 0.05$) did not positively affect farmers' credit behaviour, education significantly and positively influenced it ($p < 0.1$). A one-unit increase in farmers' level of education was associated with a 2.85-unit increase in their credit behaviour. This implies that as farmers' education levels increase, their likelihood of frequent access to and repayment of credit also increases. This suggests that access to credit information also depends on farmers' educational level. Level of education is an indicator of literacy and can positively influence smallholder farmers' awareness and understanding of credit sources. Education improves farmers' social class status and better positions them to understand and navigate the complex procedures associated with formal credit. This corroborates the findings of Eneji et al. (2021), who noted that quality education facilitates access to credit for farmers and improves their understanding of improved farming methods.

Similarly, the sources of credit accessed, in terms of ease, low interest rates, and affordability, did not positively influence credit behaviour ($p < 0.01$). A unit increase in the formal credit source reduces farmers' credit behaviour by 0.666, supporting the idea that farmers prefer informal credit sources to formal ones. Low interest rates, no collateral, and ease of repayment characterize informal credit sources. This corroborates the findings of Ameh et al. (2018), who attribute the high use of informal credit sources to lower interest rates and fewer collateral security requirements. Easier access to better credit for farmers to obtain essential

inputs when needed. Likewise, the farmers' choice of formal credit ($p < 0.1$) did not improve their credit behaviour. This factor largely relates to the disappointment that smallholders may have experienced under developmentalist models that present themselves as expansion, commercialization, and the adoption of large-scale technologies, which, in most cases, leave them worse off. Consequently, they expressed a preference for informal credit sources that entail lower risk and pressure and afford them the opportunity for gradual progress.

Table 9. *Results of the Binary Logit Model on the Determinants of Credit Behaviour*

	Coefficient (SE)	**p-value**	**Odds ratio**
Age	-0. 054 (0.032)	0.099*	0.948
Gender	0.451(0.576)	0.434	1. 570
Religion	1.483(0.647)	0.022**	4.470
Marital status	-1. 660(0.808)	0.040**	0.190
Education	1.047(0.571)	0.067*	2.850
Family size	0.306(0.193)	0.113	1.358
Farm size	-0.148(0.101)	0.141	0. 862
Mode of farming	0.444(0.845)	0.599	1. 558
Years of farming experience	-0.015(0.031)	0.637	1.015
Availability of agricultural credit	-0.214(0.168)	0.462	0.884
Source of agricultural credit	-0.406(0.152)	0.008***	0.666
Factors informing farmers' decision to explore credit facilities	-0.203(0.152)	0.182	0.817
Perception of farmers about each credit type	-0.524(-0.722)	0.468	0. 592
Constraints associated with accessing each credit type	-0.588(0. 601)	0.328	1.800
Choice of agricultural credit	-0.058(0.039)	0.069*	0.943
Omnibus Test			
$Chi^2 = 57.873$***			
Cox & Snell $R^2 = 0.373$			
Nagelkerke $R^2 = 0.506$			
Model correctness (%) = 79			

***p<0.01, **p<0.05, *p<0.10

5.0 Conclusion and Recommendations

This study examined the credit behaviour of smallholder farmers as a panacea for poor agricultural production. It concludes that smallholders' credit behaviour is significantly influenced by their perceptions of credit sources; by implication, they appear not to be favourably disposed toward formal credit sources, which largely carry the semblance of developmentalism. Farmers prefer informal sources of credit for their flexibility, trust, and accessibility, given limited access to formal credit. Additionally, key socioeconomic factors such as age, education, and religion strongly shape farmers' credit behaviour. Based on these findings, the study recommends that the government and key agricultural stakeholders consider innovative approaches to strengthen and consolidate the informal credit system among smallholder farmers, given its effectiveness and their favourable disposition toward it. Formal financial institutions should increasingly be farmer-centred by providing regular, adequate, and tailored support to boost their productivity.

It is also recommended that key socioeconomic characteristics of smallholder farmers, such as age and educational level, be considered when developing and implementing policies to enhance their access to agricultural credit. The government should design interventions that improve farmers' perceptions of agricultural credit, increase input subsidies, and promote financial literacy. Beyond its immediate policy relevance, this study also contributes to broader debates. By showing how smallholders rely on informal credit, this analysis highlights the limits of a developmentalist model that assumes formal credit always benefits farmers. Instead, the evidence reflects elements of a sustainability perspective that emphasize socially inclusive, context-specific, and resilient credit delivery. In this way, the study advances the literature by linking micro-level farmer behaviour to macro-level debates on agricultural development in Nigeria.

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