



# Assessment of Gender Inclusion in Credit Utilization among Farmers in Ondo State, Nigeria

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

This study evaluates gender inclusion in credit utilization among farmers in Ondo State, Nigeria. The research aimed to analyze the nature of credit accessed, identify factors influencing credit utilization and access, and assess the constraints faced by male and female farmers. Data were

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collected from 120 farmers using a structured questionnaire and analyzed using descriptive statistics, linear regression, and logit regression models. Findings revealed that male farmers were more likely to access both formal and informal credit than female farmers, with 79.3% of males applying for credit compared to 42.1% of females. Education was a significant factor influencing credit utilization for both genders, while age, marital status, and farm size also positively impacted credit utilization among female farmers. High collateral requirements, complex application processes, and gender bias were key constraints in accessing credit, particularly for female farmers. The study concluded that education plays a vital role in credit access and utilization, with male farmers generally being more advantaged. Recommendations include government-backed empowerment programs and supervised credit schemes to improve credit access for both genders, especially women, and enhance agricultural productivity.

*Keywords: Agriculture; credit utilization; farmers; gender inclusion; rural development; Nigeria.*

## 1. INTRODUCTION

In many developing countries, including Nigeria, access to agricultural credit is a critical factor for boosting agricultural output and promoting rural development. This is particularly true for small-scale farmers, as it helps to enhance productivity and improve living standards by breaking the cycle of poverty (Benjamin, 2013). Credit provided by both government and private institutions is vital in achieving increased production and sustainable growth, but this can only happen if farmers, the end-users, utilize it effectively. The inadequate availability, accessibility, and affordability of credit have been key factors contributing to the decline of agriculture's contribution to Nigeria's economy (Oladeebo and Oladeebo, 2018). Every segment of agricultural production relies on sufficient capital, as capital is a key resource that determines access to other necessary resources for farmers (Diagne et al., 2019).

Research has shown that agricultural credit plays an essential role in agricultural development (Diagne et al., 2009). However, it is often noted that farmers require credit not only for farming activities but also for family consumption and welfare expenses, particularly during the off-season. This dual need has raised concerns about the possible diversion of agricultural credit for non-farming purposes. Additionally, past studies have indicated that the impact of agricultural credit is not solely determined by its availability, accessibility, and affordability, but also by its proper and efficient allocation and utilization for the intended agricultural purposes (Oboh, 2008).

Credit has proven to be a powerful tool for alleviating poverty and fostering rural development, particularly when distributed

equitably between male and female small-scale farmers. Due to the seasonality of their activities and the uncertainties they face, small-scale farmers often require credit. Credit helps them acquire necessary inputs that boost productivity (Feder et al., 2011). It has been argued that credit access significantly influences the appropriate use of agricultural inputs (Bashir et al., 2010).

The agricultural sector in developing countries, such as Nigeria, faces several challenges, one of which is the limited access to credit experienced by female small-scale farmers. These women are key contributors to agriculture and the rural economy, but they often face credit constraints due to their gender (Team and Doss, 2011; FAO, 2011). This limited access reduces their productivity. Despite their significant contributions, female farmers generally have fewer productive resources and less access to services such as credit compared to their male counterparts (World Bank, 2009). Even though women constitute a significant portion of the agricultural labor force, gender disparities in credit access remain a critical issue (Ghosh and Vinod, 2017). These gender differences, rooted in socially constructed relationships between men and women, contribute to the unequal distribution of agricultural resources and hinder development outcomes (Moser, 2012).

The role of women in ensuring sustainable agricultural growth is increasingly recognized, given their substantial involvement in agricultural activities. In Nigeria, women make up about 70% of the agricultural workforce (AfDB, 2015). Yet, they face more challenges than men in accessing essential resources such as land, agricultural inputs, and financial services, including credit. For instance, a study by Oseni et al. (2015) found that female farmers in northern

Nigeria were 28% less productive than their male counterparts due to limited access to credit and other financial resources. As a result, policies aimed at enhancing productivity and empowering women in agriculture have become essential priorities for Nigerian agricultural development.

Efficient credit utilization is crucial in improving agricultural productivity. When credit is used for its intended purposes, it not only boosts farm returns and agribusiness but also enhances farmers' capacity to repay the loans. However, if credit is misused or diverted to non-productive purposes, its intended benefits are not realized. The misuse of agricultural credit has, in many cases, led to increased loan defaults, negatively impacting both formal and informal lending institutions (Darling, 2012). This underscores the need for educating farmers on the effective and productive use of credit.

The Nigerian government has implemented several strategies to revitalize rural agriculture, including the establishment of the Nigerian Agricultural, Cooperative, and Rural Development Bank (NACRDB) in 2000. NACRDB is the largest agricultural development finance institution in Nigeria and aims to provide both macro and micro credit to support agricultural development and reduce poverty among rural and urban populations.

Female farmers, who are often involved in various aspects of farming, such as processing, storage, and marketing, face numerous challenges in accessing credit. These challenges include delays in loan disbursement, stringent collateral requirements, and the misallocation of funds by bank officials. Such barriers hinder small-scale female farmers from fully participating in agricultural production. Improving these conditions could significantly enhance the income and economic stability of low-income women farmers.

The utilization of credit is widely recognized as a key factor in increasing agricultural productivity (Oparinde and Olutumise, 2022; Olutumise, 2023). Given the unique environmental and cultural context of Nigerian agriculture, it is essential to reassess how credit is utilized among farmers, with a particular focus on gender disparities in credit access and utilization. Gender inequality in credit access has been identified as a significant factor contributing to underperformance in the agricultural sector (Adesina et al., 2015; Akinrotimi, 2024). Although

women play equal roles in agriculture, they continue to face more obstacles in accessing credit compared to men (Johnson, 2011; Olutumise et al., 2023; Oparinde et al., 2023).

This study seeks to examine gender inclusiveness in credit utilization among farmers in Ondo State, Nigeria. Previous research has focused on factors affecting credit access among small-scale farmers in economically developing nations (Baiyegunhi and Fraser, 2014; Chauke et al., 2013; Dube et al., 2015; Olutumise et al., 2023; Oparinde et al., 2023; Akinrotimi, 2024), but these studies often overlook gender differences in credit utilization. By addressing this gap, the study will provide valuable insights into the credit situation of farmers in the study area and offer recommendations for improving access to credit and its effective utilization.

### 1.1 Objectives of the Study

The overall objective of this study is to assess gender inclusion in credit utilization among farmers in Ondo State, Nigeria. The specific objectives are to:

1. Examine the nature of credit access by male and female farmers in the study area;
2. Analyze the factors influencing credit utilization between male and female farmers;
3. Identify the factors affecting credit access for both male and female farmers; and
4. Highlight the challenges faced by male and female farmers in obtaining credit in the study area.

## 2. MATERIALS AND METHODS

The study was conducted in Ondo State, Nigeria, and relied on primary data collected from selected farmers. Data was gathered using a structured questionnaire designed to capture essential information on various variables. Following Akinrotimi (2024), a total of 120 respondents were selected for the study using a multi-stage sampling technique. In the first stage, purposive sampling was employed to select three districts within the Idanre Local Government Area. In the second stage, five communities were randomly selected from each of the three districts. Finally, eight farmers were randomly chosen from each of the selected communities, resulting in a sample size of 120 male and female farmers participating in the research. To achieve the objectives of the study, both

descriptive and inferential statistical tools were employed. Descriptive statistics such as mean values, frequency counts, and percentages were used to analyze the data for objectives 1 and 4. For objective 2, linear regression analysis was applied to examine the factors influencing credit utilization among the farmers. Logistic regression analysis was used for objective 3 to determine the factors affecting access to credit.

## 2.1 Model Specification

Linear regression was used to analyze the factors affecting credit utilization in the study area. The model is appropriate for analyzing factors affecting credit utilization because the outcome variable (credit utilization) is continuous, allowing the model to estimate the relationship between predictor variables (e.g., income, education, age, etc.) and the amount of credit utilization. This method provides interpretable coefficients that indicate how each factor influences credit utilization, making it suitable for identifying and quantifying the determinants of credit usage in the study area.

Implicit function:  $Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, e)$  (1)

Explicitly, the models were expressed as follows:

$$Y_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + U_i \quad (2)$$

Where:

- Y = Volume of Credit given (Naira)
- X<sub>1</sub> = Age (Years)
- X<sub>2</sub> = Marital Status
- X<sub>3</sub> = Household Size
- X<sub>4</sub> = Level of Education
- X<sub>5</sub> = Farm Size (ha)
- X<sub>6</sub> = Experience (Years)
- X<sub>7</sub> = Net farm income (Naira)
- X<sub>8</sub> = Labour cost (Naira)
- X<sub>9</sub> = Member of association (1=yes, 0=no)
- U<sub>i</sub> = Error term

Logistic regression was used to analyse the factors affecting access to credit. Logistic regression is appropriate for analyzing factors affecting gender access to credit because the outcome variable (credit access) is binary (e.g., "accessed" or "not accessed"). This method effectively estimates the relationship between predictor variables (e.g., age, education, farm income, etc.) and the likelihood of credit access while handling categorical and continuous

predictors. Therefore, following Olutumise (2024), the probability function is expressed in equations 3 and 4 below.

$$(y = 1) = P = \frac{e^{(\beta_0 + \beta_1 X_1 + \dots + \beta_n X_n)}}{e^{(\beta_0 + \beta_1 X_1 + \dots + \beta_n X_n)} + 1} \dots \quad (3)$$

$$P(y = 0) = 1 - P = 1 - \left\{ \frac{e^{(\beta_0 + \beta_1 X_1 + \dots + \beta_n X_n)}}{e^{(\beta_0 + \beta_1 X_1 + \dots + \beta_n X_n)} + 1} \right\} \dots \quad (4)$$

From the equations above,

y = 1 represents the probability of credit accessed, and equals P

y = 0 represents the probability of being a not credit accessed, and equals 1 – P

β = Coefficient

X = Explanatory variables

Therefore, the binary logit regression model in Equation 5 is derived from the two equations above.

$$\ln \left[ \frac{p}{1-p} \right] = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n \dots \quad (5)$$

$\ln \left[ \frac{p}{1-p} \right]$  can be written as in the equation 4 below:

$$\ln \left[ \frac{Y_i}{1-Y_i} \right] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \beta_7 X_7 + \varepsilon_i \dots \quad (6)$$

Where,

- β<sub>0</sub> = Constant
- β<sub>i</sub> = Coefficient of explanatory variables X<sub>1</sub> – X<sub>n</sub>
- Y = Access to credit (1=access, 0= no access)
- X<sub>1</sub> = Age of the respondent (Years)
- X<sub>2</sub> = Marital Status (1= married, 0= otherwise)
- X<sub>3</sub> = Household size
- X<sub>4</sub> = Education (1= educated, 0= otherwise)
- X<sub>5</sub> = farming experience (years)
- X<sub>6</sub> = Membership of association (1= yes, 0= no)
- X<sub>7</sub> = farm income (N)
- e = random error term

## 3. RESULTS AND DISCUSSION

### 1. Nature of Credit Accessed

Table 1 presents the credit access patterns among male and female farmers in the study area. The data showed that a significant proportion of male farmers (79.3%) applied for credit, while only 42.1% of female farmers sought credit from either formal or informal sources. Additionally, the findings indicate that 40.2% of

male farmers applied for credit from commercial banks, whereas none of the female farmers did. This discrepancy may be attributed to the fact that female farmers often lack the necessary collateral and assets required by formal financial institutions. On the other hand, 15.8% of female farmers obtained loans from moneylenders, 5.3% sought credit from friends or family, and 21.2% applied for credit through cooperative societies. The findings shared the same view with the study of Akinrotimi (2024).

## 2. Factors Influencing Credit Utilization Between Male and Female Farmers

Table 2 presents the results of the regression analysis used to identify the factors affecting credit utilization among male and female farmers in the study area. The adjusted R<sup>2</sup> values for male and female farmers were 0.531 and 0.688, respectively. This indicates that 53.1% of the variation in the volume of credit accessed by male farmers and 68.8% of the variation for female farmers can be explained by the independent variables included in the model.

For male farmers, the results show that education is the only variable with a positive and significant effect on the volume of credit accessed. This suggests that as the number of years of education increases, the amount of credit accessed by male farmers also increases, all other factors being constant. This finding is consistent with the work of Lubung et al. (2012) and Keil et al. (2011), who argue that higher education levels enable individuals to better exploit opportunities.

Regarding female farmers, the analysis reveals that age, marital status, education, and farm size all have a positive and significant influence on the volume of credit accessed. Additionally, household size has a significant negative effect at the 1% level, indicating that an increase in household size reduces the amount of credit accessed by female farmers, all else being equal. On the other hand, increases in age, marital status, education, and farm size are likely to result in a higher volume of credit accessed by female farmers in the study area. Fatuase et al. (2017) found similar results in determining gender differentials of assessing resources using truncated regression.

**Table 1. Distribution based on the nature of credit accessed**

	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Applied for Credit	65	79.3	16	42.1
Commercial Banks	33	40.2	0	0
Money Lender	10	12.2	6	15.8
Friends/Family	7	8.5	2	5.3
Cooperative Society	15	18.3	8	21.1

**Table 2. Linear regression result showing the factors influencing credit utilization**

Variable	Male			Female		
	Coefficient	T-value	Sig	Coefficient	T-value	Sig
(Constant)	5.214***	6.369	.000	6.432***	7.308	.000
Age (Years)	-.008	-.619	.538	.102***	3.460	.002
Marital status	-.022	-.188	.851	1.358***	3.486	.002
Household size	-.020	-.982	.330	-.181***	-3.422	.002
Education	.025**	2.202	.031	1.366**	2.770	.011
size of farm	-.029	-.787	.434	.003***	3.041	.006
Years of experience	.015	.167	.868	-.032	-1.292	.210
Income	0.8598	.217	.829	-0.41707	-1.825	.082
Farmer association	.278	1.303	.197	-.241	-1.004	.326
R <sup>2</sup>	0.531			0.688		
F-value	3.547			4.599		

Dependent Variable: Volume of credit accessed

\*\*\* significant at 1%

\*\* significant at 5%

### 3. Determinant of credit access by male and female farmers

Table 3 presents the results of the Logit model analysis for determining the factors influencing credit access among both male and female respondents. The estimated Logit regression model yielded R-squared values of 0.532 for male respondents and 0.428 for female respondents. This indicates that the explanatory variables included in the model account for approximately 53.2% of the variation in credit access decisions for male farmers, and 42.8% of the variation in credit access for female farmers.

For the male respondents, the Logit model results show that the coefficients for education and farming experience are positive and statistically significant at the 5% level. This suggests that increases in the level of education and farming experience enhance the likelihood of accessing credit by male farmers. Interestingly, farm income also emerged as statistically significant at the 5% level, but with a negative slope coefficient. This finding implies that as farm income increases, the likelihood of male farmers accessing credit decreases. Furthermore, the results suggest that a 5% increase in the level of education for male farmers improves their chances of accessing credit.

For female respondents, the results indicate that only education has a statistically significant relationship with credit access. Specifically, each additional year of education for female farmers increases the likelihood of accessing credit by 5% in the study area.

### 4. Constraints faced by both Gender in Accessing Credit

Table 4 presents the distribution of the constraints encountered by both male and female farmers in accessing credit in the study area. The findings indicate that the most significant constraint for male farmers was the high collateral requirement, with 67 respondents identifying it as their primary challenge. Similarly, for female farmers, the majority (34 respondents) cited both high collateral requirements and gender bias as major barriers to accessing credit. A possible explanation for this is the limited ownership of valuable properties by women in the area, which restricts their ability to meet the collateral requirements imposed by formal lending institutions. This collateral issue poses a significant challenge for female farmers when seeking loans.

Additionally, high interest rates were identified as a considerable constraint by both male and female farmers. Specifically, 24 male farmers reported high interest rates as a barrier, while 15 female farmers also highlighted the complex application processes as a major hurdle in obtaining credit. For female farmers, the least significant constraint was the prolonged loan processing time, whereas male farmers identified gender bias as the least concerning factor in their access to credit. The constraints faced were similar to those of Bobola et al. (2019) and Akinrotimi (2024), (Olutumise et al., 2021).

**Table 3. Logit regression showing the factors affecting access to credit**

Variables	Male			Female		
	B	S.E.	Sig	B	S.E.	Sig
Age of respondent	-.052	.075	.487	-.136	.093	.142
Marital status	-1.348	.841	.109	.239	1.258	.849
Household size	.030	.160	.851	-.216	.255	.398
Level of education attained	3.174**	1.497	.034	.251**	.130	.044
Size of farm	-.322	.288	.263	-.129	.243	.596
Years of experience	.194**	.101	.050	-.745	1.111	.503
Farmer association	-.419	1.374	.761	-1.289	1.198	.282
INCOME	-1.400**	.628	.026	-2.064	1.241	.096
Constant	8.345	5.029	.097	16.257	8.812	.065
Cox & Snell R <sup>2</sup>	0.532			0.428		

Dependent Variable= Access to credit  
 \*\*\* significant at 1%  
 \*\* significant at 5%

Source: Field Survey, 2023

**Table 4. Distribution of the respondent based on the constraint faced**

Constraint	Male		Female	
	Frequency	Rank	Frequency	Rank
High collateral requirement	67	1 <sup>st</sup>	34	1 <sup>st</sup>
Complex application requirement	58	2 <sup>nd</sup>	15	4 <sup>th</sup>
Bureaucracy	43	4 <sup>th</sup>	16	3 <sup>rd</sup>
Lack of information	45	3 <sup>rd</sup>	8	5 <sup>th</sup>
Long loan processing period	31	5 <sup>th</sup>	1	7 <sup>th</sup>
Gender preference	12	7 <sup>th</sup>	23	2 <sup>nd</sup>
High-interest rate	24	6 <sup>th</sup>	5	6 <sup>th</sup>
Late disbursement of loan	8	8 <sup>th</sup>	0	8 <sup>th</sup>

#### 4. CONCLUSION AND RECOMMENDATIONS

This study was conducted to assess gender inclusion in credit utilization among farmers in Ondo State, Nigeria. The results indicate that male farmers are generally more educated and more likely to access formal credit sources compared to female farmers. While 79.3% of male farmers applied for credit from both formal and informal sources, only 42.1% of female farmers did the same, with female farmers relying more heavily on informal sources such as moneylenders. Education was found to be a significant factor in determining the volume of credit utilized by both genders, though male farmers' education was the primary factor influencing their credit utilization, while for female farmers, age, marital status, education, and farm size were key factors. Household size negatively impacted the volume of credit accessed by female farmers. When it comes to accessing credit, the male farmers' education and experience were key determinants, while for female farmers, only education played a significant role in increasing their likelihood of accessing credit. Both male and female farmers cited high collateral requirements as the most significant constraint to credit access, with additional challenges for female farmers including gender bias and bureaucratic obstacles.

Based on the findings of this study, the following recommendations are made:

- The government should implement empowerment programs aimed specifically at youth and women in agriculture, coupled with accessible credit facilities. Such initiatives will not only enhance the agricultural productivity of the country but

also promote inclusive growth in the agricultural sector.

- A government-backed supervised credit scheme should be established to ensure equal access to credit for both male and female farmers. This scheme should focus on addressing the gender disparity in credit access and provide training to farmers on how to effectively utilize credit.
- It is crucial for the government to ensure that farm credit is made available to all farmers, irrespective of gender. Providing equal opportunities for both male and female farmers to access credit will contribute to increased agricultural output and improved food security in the study area.

#### DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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