



(RESEARCH ARTICLE)



ANALYSIS OF ACCESS TO AGRICULTURAL CREDIT AMONG SMALLHOLDER FARMERS IN BADE LOCAL GOVERNMENT AREA OF YOBE STATE, NIGERIA

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ABSTRACT

This study analyzed access to agricultural credit among smallholder farmers in Bade Local Government Area of Yobe State, Nigeria. The study employed the use of multistage sampling techniques to select 397 smallholder farmers that were used for the study. Primarily, a well structured questionnaire were used in data collection. Both descriptive and inferential statistics were used in data analysis. The results revealed that majority of the respondents were middle-aged farmers with a mean age of 46.7 years, 67.0% were male, 64.0% had access to credit, 27.2% applied for credit facilities, 67.3% owned bank accounts, 62.0% had access to extension services, 27.0% belonged to cooperative societies, 68.3% had access to credit information and 79.6% perceived borrowing as risky. The result of Chi-square analysis revealed that cooperative membership ($\chi^2 = 15.191$, $p < 0.001$), extension programme participation ($\chi^2 = 4.799$, $p = 0.028$), bank account ownership ($\chi^2 = 5.137$, $p = 0.023$), access to credit information ($\chi^2 = 6.806$, $p = 0.009$) and perception of borrowing risk ($\chi^2 = 6.495$, $p = 0.011$) significantly influenced farmers' access to credit, while access to extension services was not statistically significant ($p > 0.05$). The study concluded that access to agricultural credit among smallholder farmers in the study area is significantly influenced by socio-economic and institutional factors. The study recommends that strengthening agricultural credit programs, simplifying collateral requirements and loan procedures, promoting cooperative membership, expanding extension services, improving financial literacy and increasing rural financial inclusion to enhance farmers' access to credit and agricultural productivity.

Keywords: Access, Agricultural Credit, Smallholder Farmers, Factors, Yobe State

1 INTRODUCTION

Agriculture remains one of the most important sectors of the Nigerian economy because of its contribution to food security, employment generation, poverty reduction and economic development [1]. This is because the sector provides livelihoods for the majority of the rural population and serves as a major source of food, raw materials for industries and income for millions of households. According to the Food and Agriculture Organization of the United Nation (FAO),

agriculture plays a critical role in achieving sustainable development, particularly in developing countries where a large proportion of the population depends directly on farming for survival [1]. In Nigeria, agriculture contributes about 24% of the Gross Domestic Product (GDP) and employs over 36% of the labour force, making it the country's largest employer [2]. The agricultural sector in Nigeria is dominated by smallholder farmers, who account for more than 80% of food production [3]. These farmers cultivate relatively small land holdings using family labour and limited mechanization. Despite their enormous contribution to national food production, smallholder farmers continue to face numerous challenges, including inadequate access to improved farm inputs, poor rural infrastructure, climate variability, weak extension services and limited access to financial services [4]. These constraints have continued to limit agricultural productivity and rural household incomes.

Access to agricultural credit has been widely recognized as one of the most important factors for improving agricultural productivity and enhancing the welfare of smallholder farmers. Agricultural production requires substantial financial resources for purchasing improved seeds, fertilizers, agrochemicals, irrigation facilities, farm machinery and other productive inputs. According to [5], agricultural credit helps farmers overcome liquidity constraints, enabling them to adopt improved technologies and increase farm productivity. [6] noted that financial inclusion improves investment opportunities, household resilience and agricultural development by enabling farmers to access affordable financial services. Despite the importance of agricultural finance, access to formal credit remains limited among smallholder farmers in Nigeria. Financial institutions often regard agriculture as a high-risk sector because of weather uncertainties, pest infestations and fluctuating market prices. Access to affordable credit enables farmers to invest in climate-smart agricultural technologies such as irrigation facilities, drought-resistant crop varieties and improved water management practices [7]. Such investments are essential for improving resilience and sustaining agricultural production under changing climatic conditions.

Yobe state is one of the predominantly agrarian states in Northeastern Nigeria, where farming constitutes the major source of livelihood for most rural households. Bade Local Government Area (LGA) possesses considerable agricultural potential because of its fertile floodplains and irrigation opportunities associated with the Komadugu-Yobe River. Major crops grown include rice, millet, sorghum, maize, wheat, cowpea and vegetables. However, agricultural production in the area remains constrained by inadequate access to institutional credit, poor infrastructure, limited extension services, climate variability and low adoption of improved technologies. Although various government programs and financial institutions have introduced agricultural credit schemes to improve farmers' access to finance, many smallholder farmers in the study area continue to experience difficulties in obtaining adequate and timely credit. As a result, many farmers depend on informal credit sources such as relatives, friends, cooperative societies and money lenders. These sources often provide inadequate loan amounts with short repayment periods, making it difficult for farmers to invest in modern agricultural technologies and expand production [8]. Therefore, there is a need for empirical based evidence on smallholder farmers access to agricultural credit in the study area. It is against this background that the study seeks to analyze access to agricultural credit among smallholder farmers in Bade LGA of Yobe State, Nigeria. The specific objectives of the study were to:

- Describe the socio-economic and institutional characteristics of smallholder farmers in the study area;
- Assess the level of access to agricultural credit among smallholder farmers;
- Examine the institutional factors influencing smallholder farmers' access to agricultural credit.

2 MATERIALS AND METHOD

2.1 The Study Area

The study was conducted in Bade LGA, Yobe state, Nigeria. The administrative headquarters of the LGA is Gashu'a. Geographically, the area is located within the approximate coordinates of latitude 12°40'N to 13°10'N and longitude 10°40'E to 11°20'E. Bade LGA covers an estimated land area of about 772 km² and lies within the semi-arid ecological zone of the Sudan-Sahel Savannah and has a projected population in 2025 based on the 2006 census figure and an average annual rate of 2.9%, is approximately 238,300 people. This increase reflects ongoing population growth and rural settlement expansion in the area [9, 10, 11]. The terrain is generally flat with scattered depressions that support seasonal farming activities, particularly during the rainy season as indicated in a similar study area by [12]. The climate of Bade LGA is semi-arid, characterized by distinct wet and dry seasons with an annual rainfall ranges between 650 mm and 750 mm, and temperatures are generally high throughout the year, ranging from 28°C to 42°C depending on the season [13]. Agriculture is the dominant economic activity in Bade LGA.

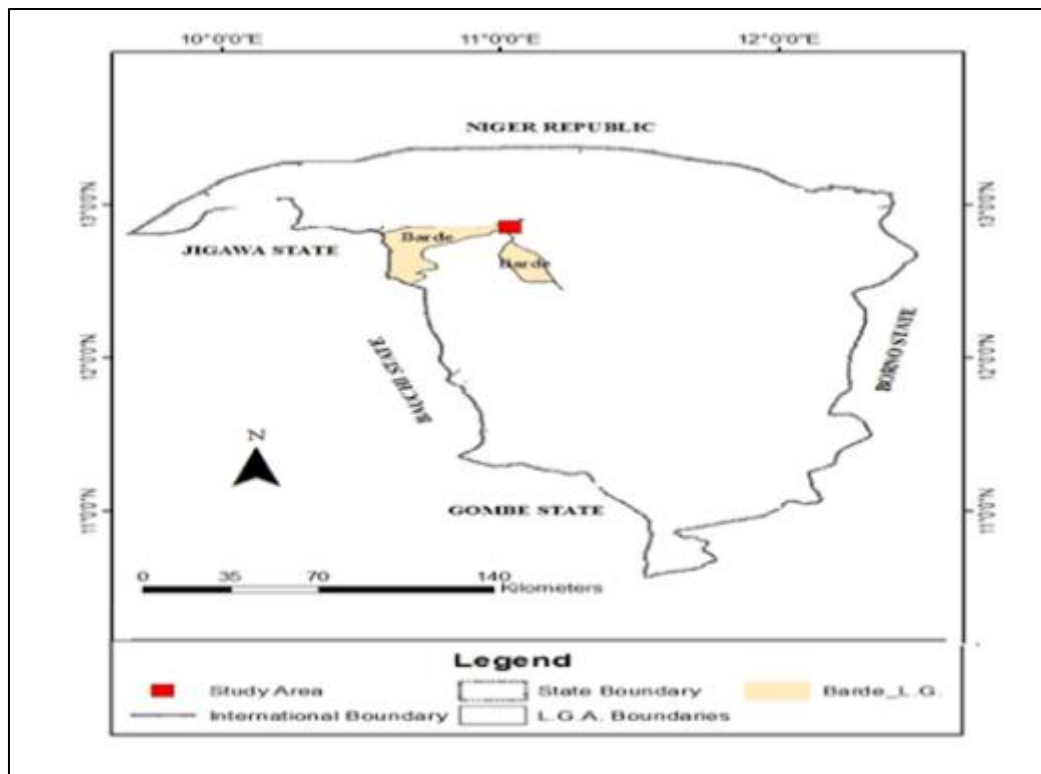


Figure 1: Map of Yobe State Showing the Study Area.

2.2 Sampling Procedure and Sample Size

2.3 Sampling Procedure

The sample population was made up of small-holder farmers, identified and registered with the Agricultural Development Project (ADP) in conjunction with the government agricultural transformation agenda. A multi-stage sampling procedure was employed for the study. The first stage involves the purposive selection of Yobe state being known for high farming activities within the Northeastern states of Nigeria. In the second stage, Bade LGA is also purposively selected having high concentration of smallholder farmers, its dependence on rain-fed agriculture, and the increasing need for improved access to formal financial services to support agricultural productivity and rural livelihoods [14]. In the third stage, a random selection of 4 wards in Bade LGA namely Usur/Dawayo, Zango, Dagona and Sugum/Tagali wards was carried out. Thereafter, proportionality was used to determine the numbers of respondents from each of the four (4) wards selected for the study using the sampling frame obtained from the Yobe State Agricultural Development Programme [15].

2.3.1 Sample Size

The sample size for this study was calculated using Taro Yamane (1967) formula, as used by [16]. The total sample frame for the study was 61,792 farmers drawn from four wards which was obtained from YOSADP as presented in table 1. The Yamane (1967) provides a simplified formula which was used to calculate sample size for this study. It is represented by the equation below;

- $$n = \frac{N}{1+N(e^2)} \dots\dots\dots (1)$$
- Where;
- n = Total sample size
- N = Total sample frame
- e = level of significance at 0.05 level of significance

To calculate the sample size for each ward, based on the sample frame and to make up the required sample size for the study, a proportionality method as employed by [16] was used. It is represented by the equation below;

- $$SSi = \frac{SFi}{TSF} \times TSS \dots\dots\dots (2)$$

- Where;
- SSi = Sample size for each ward
- SFi = Sample frame for each ward
- TSF = Total sample frame
- TSS = Total sample size

Table 1: Distribution of Selected Farmers

Ward	Sampling frame	Sample Size
Usur/Dawayo	23,011	148
Zango	8,378	54
Dagona	16,512	106
Sugum/Tagali	13,891	89
Total:	61,792	397

Source: YOSADP and Author's Computation, 2026

2.4 Method of Data Collection

This study used both primary and secondary data. Primary data was obtained through a well-structured questionnaire, complemented by an oral interview by the researcher and two assistants to elicit information on the socio-economic characteristics of small-holder farmers, their credit needs and utilization. Secondary data was obtained from YOSADP, relevant research, publication, conference papers, journals and the internet.

2.5 Method of Data Analysis

The data collected for this study were analyzed using both descriptive and inferential statistical techniques with the aid of the IBM SPSS Statistics software package. Descriptive statistics comprising frequencies, percentages, means, and standard deviations were used to summarize the socioeconomic and institutional characteristics of the respondents. Specifically, Objective (i), and (ii), were analyzed using descriptive statistics. To examine the relationship between institutional factors and farmers' access to credit (i.e. objective iii), cross-tabulation and Chi-square (χ^2) test of independence were employed. Cross-tabulation was used to compare the distribution of respondents according to their access to credit across selected institutional variables, while the Chi-square test was used to determine whether the observed differences between the categorical variables were statistically significant. The Chi-square statistic is expressed as:

$$\chi^2 = \sum \frac{(O-E)^2}{E} \dots\dots\dots(3)$$

- Where:
- χ^2 = Chi-square statistic;
- = Observed frequency;
- E = Expected frequency under the null hypothesis.

The decision rule adopted was to reject the null hypothesis when the probability value (p-value) was less than 0.05 ($p < 0.05$), indicating a statistically significant association between the variables.

3 RESULTS AND DISCUSSION

3.1 Socio-economic Characteristic of Smallholder Farmers

3.1.1 Age of the respondents

Table 2 presents the socio-economic characteristics of the respondents. The results show that majority of the respondents (38.8%) were within the age range of 50–59 years with a mean age of 46.70 years, indicating that the farmers were predominantly middle-aged and economically active. This suggests that the respondents are within the productive age group and are capable of engaging in farming activities and utilizing financial services when available. This correspond with the findings of [17], who reported that age significantly influenced financial inclusion and access to financial services among smallholder farmers in Oyo State, Nigeria.

3.1.2 Sex

The distribution of respondents by sex revealed that males constituted 67.0% of the sample, while females accounted for 33.0%. This indicates male dominance in farming activities within the study area. The finding may be attributed to cultural and socio-economic factors that give men greater access to productive resources, including land and financial services. The study concurs with [18, 19] who showed that cowpea production is dominated by male in their respective studies.

3.1.3 Marital status

Majority of the respondents (87.9%) were married, while 5.3% were widowed, 4.8% divorced, and 2.0% separated. The high proportion of married respondents suggests that farming households in the area are family-based, with married individuals likely having greater household responsibilities that may influence their demand for financial services and agricultural credit. Similar results were obtained by [20] who opined that majority (54.2%) of cowpea farmers in Yobe States were married.

3.1.4 Household size distribution of the respondents

The household size distribution showed that 42.6% of the respondents had household sizes of 11–15 persons, while 26.7% had between 6 and 10 persons. The mean household size was 12 persons. This indicates relatively large household sizes among farming families, which may provide family labour for agricultural production but also increase household consumption needs and demand for financial support. This agrees with the findings of [18] who reported a mean household size of 25 and 9 persons in the study area.

3.1.5 Level of education of the respondents

The educational profile of the respondents revealed that 68.5% had non formal education, while 10.1%, 6.3%, and 15.1% had primary, secondary, and tertiary education, respectively. The high proportion of farmers without formal education suggests a low literacy level among respondents, which may limit their awareness and utilization of formal financial services, especially those requiring documentation and record-keeping. [21] reported that financial literacy and education significantly influence access to credit facilities and the utilization of innovative financial services among rural farmers in Nigeria.

3.1.6 Years of farming experience

The results from Table 2 further indicate that 29.97% of the respondents had 6–10 years of farming experience, while 26.45% had 11–15 years and 24.43% had 16–20 years of farming experience. The mean farming experience was 11.11 years, implying that most respondents possessed considerable farming knowledge and practical experience that could influence their financial decisions and credit utilization. [17] found that farming experience significantly influenced financial inclusion and farmers' adoption of climate adaptation strategies through improved access to financial services.

3.1.7 Primary occupation of the respondents

With respect to primary occupation, Table 2 showed that the majority of the respondents (58.7%) identified farming as their main occupation, while 27.2% engaged in business and 14.1% were civil servants. This indicates that agriculture remains the principal source of livelihood for most households in the study area, emphasizing the importance of accessible financial services for enhancing agricultural productivity and income. [22] indicated that 79.6% of respondents are full-time farmers indicating farming as their sole occupation.

3.1.8 Cooperative Membership

The results show that only 27.0% of the respondents belonged to cooperative societies. The low level of cooperative membership may reduce farmers' opportunities to access group-based credit facilities, agricultural information, and other financial services often provided through cooperative organizations. [23] found that membership in agricultural cooperatives significantly enhances financial inclusion and access to financial services among farmers in Anambra State, Nigeria.

Table 2: Socio-economic Characteristics of Smallholder Farmers (N=397)

Variable	Frequency (f)	Percentage (%)	Mean
Age			
20-29	22	5.5	
30-39	75	18.9	
40-49	120	30.2	46.70
50-59	154	38.8	
60-70	26	6.5	
Sex			
Male	266	67	
Female	131	33	
Marital status			
Married	349	87.9	
Divorced	19	4.8	
Separated	8	2	
Widowed	21	5.3	
Household size			
1 to 5	48	12.1	
6 to 10	106	26.7	
11 to 15	169	42.6	12
16-20	62	15.6	
21-25	6	1.5	
25-30	6	1.5	
Level of education			
Non formal	272	68.5	
Primary	40	10.1	
Secondary	25	6.3	
Tertiary	60	15.1	
Years of farming experience			
1-5	70	17.63	
6-10	119	29.97	
11 to 15	105	26.45	11.11
16-20	97	24.43	
21-25	6	1.51	
Primary occupation			
Farming	233	58.7	
Civil servant	56	14.1	
Business	108	27.2	
Membership of cooperative			

No	290	73	
Yes	107	27	
Total:	397	100	

Source: Field survey, 2026

3.2 Level of Smallholder Farmers' Access to Agricultural Credit

The level of smallholder farmers' access to agricultural credit in the study area is presented in Table 3. The results indicated that 64.0% reported that credit was available to them, suggesting that a majority of the farmers had access to one form of credit facility or another. However, the availability of credit does not necessarily imply effective utilization, as several institutional and socio-economic barriers may still limit farmers' ability to obtain loans. This finding suggests that although credit opportunities exist, access remains inadequate for a substantial proportion (36.0%) of farmers. The finding is consistent with the report of [24], which emphasized that despite improvements in rural financial services, many smallholder farmers in developing countries continue to experience limited access to formal agricultural credit due to institutional constraints. Similarly, [25], found that although credit facilities are available, access among smallholder farmers remains constrained by inadequate collateral, information asymmetry, transaction costs, and farmers' risk perceptions.

The findings further revealed that only 27.2% had applied for agricultural credit, indicating a relatively low level of participation in formal credit programs despite the reported availability of credit. This implies that a large proportion 72.8% of the farmers did not apply for loans. The low application rate may be attributed to factors such as fear of loan default, stringent lending requirements, high interest rates, lack of collateral, or previous unsuccessful borrowing experiences. Similarly, [26] found that several eligible farmers were unable or unwilling to apply for formal agricultural loans because of institutional bottlenecks and unfavourable lending requirements. The result on the conditions attached to available credit facilities, 42.3% rated the conditions as good or very good, while the remaining 57.7% perceived the conditions as poor or only fair. This suggests that although some farmers considered the lending conditions acceptable, the majority remained dissatisfied with the requirements attached to agricultural credit. [27] noted that simplifying lending procedures and designing farmer-friendly financial products are essential for improving financial inclusion among rural households.

The results also showed that 52.4% considered available credit facilities to be favourable, while 47.6% perceived them as unfavourable. This finding indicates that farmers were almost equally divided in their perception of the suitability of existing agricultural credit programs. Although a slight majority viewed the credit facilities positively, the high proportion of farmers with unfavourable perceptions suggests that significant improvements are still required in the design and implementation of agricultural credit schemes. Such improvements may include lower interest rates, flexible repayment schedules, reduced collateral requirements, and timely loan disbursement. According to [28], improving the accessibility and attractiveness of rural financial services enhances farmers' participation in formal credit programs and contributes to increased agricultural productivity and rural welfare. This finding is further supported by [29], who observed that inadequate access to credit remains one of the principal constraints limiting agricultural productivity among Nigerian smallholder farmers despite various government financing interventions. These findings imply that improving the quality, affordability, and accessibility of agricultural credit services is essential for increasing farmers' participation in formal credit markets and enhancing agricultural productivity.

Table 3: Level of Smallholder Farmers' Access to Credit (N=397)

Variable	Frequency (f)	Percentage (%)
Credit available (Yes)	254	64
Applied for credit (Yes)	108	27.2
Credit facility conditions (Good/Very good)	168	42.3
Credit favourable (Yes)	208	52.4

Source: Field survey, 2026

3.3 Institutional Factors Influencing Smallholder Farmers' Access to Agricultural Credit

The results presented in Table 4 show the descriptive statistics of the institutional factors influencing smallholder farmers' access to agricultural credit in the study area. Among the institutional variables examined, perception of borrowing risk recorded the highest mean score (0.80), indicating that 79.6% of the respondents perceived borrowing as risky. This suggests that a large proportion of farmers associate credit with repayment difficulties, high interest

charges, collateral requirements, or the possibility of default. Such perceptions may discourage farmers from seeking formal financial services despite their potential benefits. Similar observations were reported by [30], who identified perceived lending risk as a major barrier to credit utilization among rural farming households. Access to credit information has 0.68, implying that 68.3% of the respondents had access to information on available credit facilities. This implies that most farmers are aware of credit opportunities, lending institutions, and loan application procedures. The result on ownership of a bank account recorded a mean score of 0.67, indicating that 67.3% of the respondents maintained bank accounts. This reflects a relatively high level of participation in the formal financial system as bank account ownership facilitates savings mobilization, enhances farmers' financial records, and increases opportunities to access formal credit and other financial services. According to [6], ownership of a bank account is one of the primary indicators of financial inclusion.

Similarly, access to extension services had a mean score of 0.62, implying that 62.0% of the respondents had contact with agricultural extension agents. Extension services provide farmers with technical advice, information on improved agricultural practices, and awareness of government intervention programs, including agricultural credit schemes. Consequently, extension services are expected to enhance farmers' capacity to utilize available financial services effectively. Conversely, participation in extension programs recorded a relatively low mean score of 0.28, indicating that only 27.7% of the respondents had participated in organized extension programs while membership of cooperative societies had the lowest mean score (0.27), suggesting that only 27.0% of the respondents belonged to cooperatives. The low participation in these institutional arrangements may reduce farmers' opportunities to benefit from group lending, financial education, collective savings, and information sharing, all of which are important mechanisms for improving access to financial services. The overall grand mean of 0.55 indicates that the institutional factors considered were moderately prevalent among the respondents. Going by the decision rule of 0.50, perception of borrowing risk, access to credit information, ownership of bank accounts, and access to extension services were identified as prevalent institutional factors, whereas cooperative membership and participation in extension programs were not prevalent. The findings suggest that although many farmers are financially included through banking services and access to information, relatively low participation in cooperatives and extension programs may continue to constrain broader access to agricultural financial services.

Table 4: Descriptive Statistics of Institutional Factors Influencing Smallholder Farmers' Access to Agricultural Credits (N=397)

Variable	Frequency (f)	Percentage (%)	Mean
Access to extension services	246	62	0.62
Membership of cooperative society	107	27	0.27
Participation in extension programme	110	27.7	0.28
Ownership of bank account	267	67.3	0.67
Access to credit information	271	68.3	0.68
Perception of borrowing risk	316	79.6	0.8
Grand Mean			0.55

Source: Field survey, 2026

3.3.1 Cross-tabulation of institutional factors and smallholder farmers access to agricultural credit

Table 5 presents the cross-tabulation of institutional factors and smallholder farmers' access to agricultural credit. The descriptive results indicate noticeable differences in the distribution of farmers who had access to credit across the institutional variables. The result revealed that 33.5% of farmers who accessed credit were cooperative members compared with only 15.4% among those who did not have access to credit. Conversely, non-members constituted 84.6% of respondents without credit access but only 66.5% had access to credit. This suggests that cooperative membership is associated with improved opportunities to obtain agricultural credit. With respect to participation in agricultural extension programs, farmers who did not participate accounted for 76.0% of those who had access to credit, while participants account for 24.0%. Although participation was less common among credit beneficiaries, the descriptive results indicate that extension programs may influence farmers' interaction with financial institutions by improving knowledge of production technologies, farm management, and available credit schemes. The result also indicate that 65.0% of the respondents who had access to credit reported receiving extension services compared to 56.6% without access to credit. Although the difference is modest, it suggests that extension contact may expose farmers to improved farming practices and institutional linkages that facilitate access to agricultural finance.

The cross-tabulation further shows that bank account ownership is positively associated with access to credit. Among farmers who obtained credit, 71.3% owned bank accounts, whereas only 60.1% of those without credit access possessed bank accounts. This aligns with evidence reported by [6], which highlights bank account as a key financial inclusion an important determinant of access to formal credit. Consequently, 72.8% of the respondents who obtained credit had access to credit-related information, compared with 60.1% without access to credit. This finding implies that information regarding loan availability, eligibility requirements, interest rates, and repayment conditions encourages farmers to apply for and successfully obtain agricultural loans. Majority (83.5%) of the respondents who had access to credit indicated concerns about borrowing risks compared to 72.7% without access to credit facility. This suggests that risk perception remains an important behavioral consideration in farmers' credit decisions and underscores the need for financial literacy programs and favourable lending conditions. The descriptive cross-tabulation indicates that cooperative membership, bank account ownership, access to credit information, extension-related factors, and borrowing risk perception are associated with differences in farmers' access to credit. However, descriptive statistics alone cannot establish whether these observed differences are statistically significant. Therefore, a Chi-square tests was conducted to determine whether the associations observed in the cross-tabulations were statistically significant.

Table 5: Summary of Cross-tabulation of Institutional Factors and Smallholder Farmers' Access to Agricultural Credit (N=397)

Institutional Variable		Credit Not Available		Credit Available		Total
	Category	Frequency (f)	%	Frequency (f)	%	
Cooperative membership	No	121	84.6	169	66.5	290
	Yes	22	15.4	85	33.5	107
Extension participation	No	94	65.7	193	76	287
	Yes	46	34.3	61	24	110
Access to extension services	No	62	43.4	89	35	151
	Yes	81	56.6	165	65	246
Bank account ownership	No	57	39.9	73	28.7	130
	Yes	86	60.1	181	71.3	267
Credit information Access	No	57	39.9	69	27.2	126
	Yes	86	60.1	185	72.8	271
Borrowing risk perception	No	39	27.3	42	16.5	81
	Yes	104	72.7	212	83.5	316

Source: Field survey, 2026

3.3.2 Chi-square analysis of institutional factors influencing smallholder access to agricultural credit

The Chi-square analysis was conducted to determine whether institutional factors significantly influenced smallholder farmers' access to agricultural credit. The results presented in Table 6 revealed that cooperative membership had a highly significant association with access to agricultural credit ($\chi^2 = 15.191$, $p < 0.001$). This finding implies that farmers who belong to cooperative societies are significantly more likely to obtain agricultural credit than non-members. Cooperative societies improve farmers' bargaining power, facilitate group guarantees, provide savings opportunities, and serve as channels through which financial institutions reach rural borrowers. These functions reduce information asymmetry and transaction costs, thereby increasing lenders' confidence in borrowers. This result agrees with the findings of [31], who reported that cooperative membership significantly enhances rural farmers' access to formal agricultural credit in Nigeria. It also supports the institutional credit market theory, which emphasizes the role of rural institutions in improving access to financial services. Consequently, participation in extension programs was significantly associated with access to credit ($\chi^2 = 4.799$, $p = 0.028$). Farmers who participate in agricultural extension programs are more likely to receive information on government intervention programs, loan application procedures, improved technologies, and farm management practices. This finding is consistent with the work of [32], who concluded that agricultural extension enhances farmers' access to both technical and financial services.

Conversely, access to extension services did not have a statistically significant relationship with farmers' access to credit ($\chi^2 = 2.685$, $p = 0.101$). Although farmers with extension contact appeared to have relatively better access to credit, and the observed difference was not statistically significant at 5% level of probability. The result indicates that extension

services alone may be insufficient to overcome financial barriers facing rural farmers. The Chi-square results also indicated that bank account ownership was significantly associated with access to credit ($\chi^2 = 5.137$, $p = 0.023$). Farmers with bank accounts were significantly more likely to obtain agricultural loans than those without bank accounts. This finding corroborates [6], which identified financial inclusion as a major determinant of access to formal financial services among rural households. Similarly, access to credit information had a significant association with farmers' access to credit ($\chi^2 = 6.806$, $p = 0.009$). This implies that farmers who receive adequate information regarding available loan schemes, lending institutions, interest rates, repayment conditions, and application procedures are significantly more likely to access agricultural credit. The analysis further revealed that perception of borrowing risk was significantly associated with access to credit ($\chi^2 = 6.495$, $p = 0.011$). Although many farmers perceived borrowing to be risky, those who understood and managed these risks were more likely to obtain credit. This finding suggests that improving farmers' financial literacy and designing farmer-friendly lending policies could reduce risk perceptions and encourage greater participation in formal credit markets. These findings reinforce the institutional theory of rural finance, which argues that effective institutions reduce transaction costs, improve information flow, and enhance financial inclusion, thereby increasing access to agricultural credit.

Table 6: Summary of Chi-square Analysis of Institutional Factors Influencing Smallholder Farmers' Access to Agricultural Credit (N=397)

Institutional Variable	χ^2	df	p-value
Cooperative membership	15.191	1	<0.001**
Extension programme participation	4.799	1	0.028**
Access to extension services	2.685	1	0.101NS
Bank account ownership	5.137	1	0.023**
Access to credit information	6.806	1	0.009**
Perception of borrowing risk	6.495	1	0.011**

Source: Field survey, 2026

***=Significant at 1%, **=Significant at 5%, *=Significant at 10%, NS=Not significant

4 CONCLUSION

The study concluded that access to agricultural credit among smallholder farmers in Bade LGA of Yobe state remains inadequate despite the existence of several agricultural financing programs. Although some farmers have access to formal credit, a large proportion still depend on informal sources of finance. The study established that socio-economic characteristics and institutional factors jointly determine farmers' access to agricultural credit. Cooperative membership, participation in extension programs, ownership of bank accounts and perception of borrowing risk significantly improve farmers' chances of obtaining agricultural credit. Therefore, improving farmers' financial inclusion through stronger institutional support, simplified lending procedures, enhanced extension services and strengthened cooperative societies will significantly improve access to agricultural credit, increase agricultural productivity and promote sustainable rural development in the study area.

Recommendations

Based on the findings of the study, the following recommendations were made:

- Government should strengthen existing agricultural credit programs and ensure that agricultural loans are disbursed to farmers in a timely manner with simplified application procedures.
- Financial institutions should review their lending policies by reducing stringent collateral requirements and introducing more flexible credit conditions that are suitable for smallholder farmers.
- Agricultural extension agencies should strengthen extension services to improve farmers' awareness of available agricultural credit programs, loan application procedures and proper utilization of agricultural loans.
- Financial institutions, government agencies and development partners should organize regular financial literacy programs to improve farmers' knowledge of record keeping, loan management and repayment practices.
- Smallholder farmers should be encouraged to open and actively operate bank accounts, as financial inclusion improves access to formal credit and other financial services.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

No conflict of interest exists.

Statement of informed consent

Oral informed consent was obtained from all the individual participants included in the study.

REFERENCES

- [1] Food and Agriculture Organization (FAO). The State of Food and Agriculture 2022: Leveraging automation in agriculture for transforming agrifood systems. 2022. <https://www.fao.org/publications/sofa/2022/en>
- [2] Oyaniran T. Current state of Nigeria agriculture and agribusiness sector. African Development Bank. 2020. <https://www.afdb.org/en/documents/current-state-nigerian-agriculture-and-agribusiness-sector>
- [3] Osai Azubuike V, Nwogwugwu U, Nwokoye E. The Role of Agriculture in Economic Development: in Nigeria. Journal of International Economic Relations and Development Economics. 2023 Jul 4;3(2):103-11.
- [4] Liverpool-Tasie LSO, Kuku O, Ajibola A. A review of the evolving roles of agricultural input systems in Nigeria. African Journal of Agricultural and Resource Economics. 2020; 15(1): 1-21. <https://ageconsearch.umn.edu/record/303950>
- [5] Mohammad AA, Mohammad SI, Al-Oraini B, Vasudevan A, Hunitie MF, Ismael B. The impact of agricultural credit on farm productivity, employment, and rural development: Empirical evidence from Jordan's agricultural sector. Pakistan Journal of Agricultural Research. 2025 Sep 1;38(3):20-31.
- [6] World Bank. Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the Age of COVID-19. 2022. <https://www.worldbank.org/en/publication/globalfindex>
- [7] Intergovernmental Panel on Climate Change. Climate Change 2022: Impacts, adaptation and vulnerability. Cambridge University Press. 2022. <https://www.ipcc.ch/report/ar6/wg2/>
- [8] Falola A, Mukaila R, Abdulhamid KO. Informal finance: its drivers and contributions to farm investment among rural farmers in Northcentral Nigeria. Agricultural Finance Review. 2022 Oct 3;82(5):942-59.
- [9] National Population Commission (NPC). Nigerian projected population report 2025. 2025 Jun, 15.
- [10] Food and Agriculture Organization (FAO). The State of Food and Agriculture 2018: Migration, agriculture and rural development. 2018. <https://www.fao.org/3/I9549EN/i9549en.pdf>
- [11] Ben VE. Population growth and the Nigerian environment: Challenges and opportunities. Academic practitioners research for sustainable development goals in Africa. IkotEkpene, Nigeria: ICIDR Publishing House. 2023.
- [12] Morrison BA. 2. From Swidden to Swamps: The Study of Ancient Maya Agriculture. In Lifeways in the Northern Maya Lowlands: New Approaches to Archaeology in the Yucatán Peninsula 2022 (pp. 41-55). University of Arizona Press.
- [13] Nigerian Meteorological Agency (NIMET). Blueprints on the annual report of climatic conditions of Nigerian States 2025. 2025 Feb, 26.
- [14] Mapanje O, Karuaihe S, Machethe C, Amis M. Financing sustainable agriculture in sub-saharan africa: a review of the role of financial technologies. Sustainability. 2023 Mar 3;15(5):4587.
- [15] Yobe State Agricultural Development Program (YOSADP). Annual Performance and Evaluation Report for the Fiscal Year 2025. 2025 Nov, 30.
- [16] Mohammed N. Socio-economic variables influencing the use of information and communication technologies (ICTS) in agricultural extension service delivery among farmers in Yobe State, Nigeria. Asian Journal of Research in Agriculture and Forestry 2024; 10(2):102-118. <https://doi.org/10.9734/ajraf/2024/v10i2290>
- [17] Arowolo AO, Aminu RO, Ibrahim SB, Emmanuel AE. Does financial inclusion influence the adoption of climate change adaptation strategies among smallholder farmers? Evidence from Oyo State, Nigeria. UNIZIK Journal of Agricultural Economics and Extension. 2024; 1(2):296–304. Retrieved from journals.unizik.edu.ng
- [18] Mohammed N, Abubakar MI, Abdul'aziz MA, Kolo MK, Saje AB. Assessment of socioeconomic factors on the adoption of improved cowpea production technologies among farmers in Damaturu Local Government Area,

Yobe State, Nigeria, International Journal of Scientific and Research Publications. 2022; 12(1):321-328
<http://dx.doi.org/10.29322/IJSRP.12.01.2022.p12142>

- [19] Dodo K, Ma'ule UM, Fatsuma MA. Influence of socio-economic variables on cowpea production in Kurfi Local Government Area, Katsina State, Nigeria. Journal of Agricultural Economics, Environment and Social Sciences. 2020 Jun 10;6(1):140-147. <http://www.jaeess.com.ng>
- [20] Usman A, Bawa GA. Analytical effect of insurgency on cowpea (*Vigna spp*) production in Potiskum Local Government Area of Yobe State, Nigeria. Review of Politics and Public Policy in Emerging Economies. 2019; 1(1):53-60. www.publishing.globalcsrc.org/rope
- [21] Benedict IO, Wilson E, Ugwu CN, Ibe CB. Investing in rural agriculture in the face of innovative financial services: Does financial literacy matter in Nigeria? SAGE Open. 2024. Retrieved from journals.sagepub.com
- [22] Arimi K, Kolayemi FM, Fatufe O, Joshua TA. Cowpea farmers' vulnerability and adaptation to climate change in Iddo Local Government Area of Oyo State, Nigeria. Yuzuncu Yil University. Journal of Agricultural Science. 2020; 30(3):603-610.
- [23] Okeke HE, Nwankwo FO. Influence of cooperatives on financial inclusion of members of agricultural cooperatives in Anambra and Awka Agricultural Zones, Anambra State, Nigeria. Nigerian Journal of Cooperative Economics and Management. 2021. Retrieved from journals.unizik.edu.ng
- [24] Food and Agriculture Organization of the United Nations (FAO). The State of Food and Agriculture 2024: Value-driven transformation of agrifood systems. Rome, Italy: FAO. 2024. <https://www.fao.org/agrifood-economics/publications/detail/en/c/1722598>
- [25] Adesiyan T. Leveraging agricultural credit and digital finance for enhancing smallholder productivity and rural economic growth. International Journal of Research Publication and Reviews. 2025;6(8):3090.
- [26] Khan FU, Nouman M, Negrut L, Abban J, Cismas LM, Siddiqi MF. Constraints to agricultural finance in underdeveloped and developing countries: a systematic literature review. International Journal of Agricultural Sustainability. 2024 Dec 31;22(1):2329388.
- [27] Daniel D. Financial Inclusion and Agricultural Development among Smallholder Farmers in Gboko Local Government Area of Benue State. Kashere Journal of Politics and International Relations. 2026 Aug 26;4(2):94-112.
- [28] International Fund for Agricultural Development. Rural Development Report 2023: Transforming food systems for rural prosperity. Rome, Italy: IFAD. 2023. <https://www.ifad.org/en/web/knowledge/publications>
- [29] Khan FU, Nouman M, Negrut L, Abban J, Cismas LM, Siddiqi MF. Constraints to agricultural finance in underdeveloped and developing countries: a systematic literature review. International Journal of Agricultural Sustainability. 2024 Dec 31;22(1):2329388.
- [30] Gichuki CN, Kamau CW. Financing agribusiness: Potential determinants of financial inclusion for smallholder rural farming communities in Kenya. International Journal of Rural Management. 2022 Dec;18(3):376-93.
- [31] Kehinde AD, Akinola A, Tijani A. Unlocking yield potential through credit access: insights from smallholder tomato farmers in Nigeria. BMC Agriculture. 2026 Jan 7;2(1):3.
- [32] Aminu R, Oyawole F, Arowolo A, Ibrahim S. Relationship between access to agricultural extension services and financial inclusion status of agricultural households in Nigeria. Journal of Agricultural Extension. 2025 Jul 18;29(3):163-73.