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Determinants of Credit Repayment among Agricultural Cooperative Societies Members in Nasarawa State

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Abstract: This study investigates the determinants of credit repayment among members of agricultural cooperative societies in Nasarawa State, Nigeria. Despite the pivotal role of cooperatives in rural development, access to credit and timely repayment remain significant challenges, threatening their sustainability. Employing a descriptive survey design, data was collected from 214 cooperative members across 13 local government areas using structured questionnaires. The study examines socio-economic factors (such as income, education, farm size), organizational characteristics (like governance, communication, member cohesion), and external macroeconomic and environmental influences (including inflation, natural disasters, political stability). Multiple linear regression analyses reveal that socio-economic attributes, notably membership in farmers' organizations, farm size, and reliance on family labour, significantly enhance repayment capacity, whereas increasing age slightly diminishes it. Organizational factors, including strong bonds, transparent communication, participative decision-making, and effective leadership, collectively explain about 72% of repayment behavior, emphasizing the importance of sound organizational governance. External factors such as economic downturns, inflation, natural disasters, and rising input costs significantly impair repayment, accounting for approximately 69% of the variation. The findings underscore that both internal organizational practices and external macroeconomic conditions critically influence repayment performance. The study concludes that improving organizational structures, fostering social cohesion, increasing financial literacy, and mitigating external shocks are vital for enhancing repayment rates. Policy recommendations include capacity-building programs, tailored financial products, and macroeconomic stabilization measures to support sustainable agricultural finance. The insights contribute to understanding the complex interplay of socio-economic, organizational, and external factors affecting credit repayment, providing a foundation for policymakers, cooperative leaders, and development agencies to devise targeted interventions that promote financial discipline and resilience in Nigeria's agricultural sector.

Keywords: Socio-Economic Factors, Income, Education, Farm Size, Organizational Characteristics External Macroeconomic, Environmental Influences.

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INTRODUCTION

Agricultural cooperative societies have historically played a vital role in fostering rural development, enhancing food security, and improving the livelihoods of farmers across Nigeria and other developing countries. These cooperatives, characterized by collective ownership and democratic management, serve as pivotal platforms for pooling resources, sharing knowledge, and accessing credit (Ogunleye & Akinyele, 2020). In Nigeria, particularly in Nasarawa State, agricultural cooperatives have been instrumental in mobilizing smallholder farmers to overcome the constraints of individual farming, such as limited access to inputs, markets, and financial services (FAO, 2018). The evolution of these cooperatives traces back to the colonial period, but their formal institutionalization gained momentum in the post-independence era, with government policies aimed at promoting cooperative development as a strategy for rural empowerment and economic growth (Olaoye et al., 2019). However, despite their longstanding presence, many cooperatives continue to grapple with significant challenges, especially regarding credit access and repayment, which threaten their sustainability. The basic characteristics of agricultural cooperatives include voluntary membership, democratic governance, and shared economic benefits among members (Gebremedhin et al., 2021). These features are intended to foster trust, accountability, and collective effort, which are crucial for effective credit management. Typically, members contribute savings and access loans to finance farming inputs, equipment, or diversification projects. While cooperatives are designed to facilitate mutual support, their success heavily depends on members' ability to repay borrowed funds promptly. In Nasarawa State, the proliferation of agricultural cooperatives has been encouraged through government initiatives and donor programs aimed at reducing rural poverty and stimulating agricultural productivity (Nwankwo & Anyaogu, 2020). Nonetheless, a persistent problem remains: a significant proportion of cooperative members default on their loans, impairing the financial health of these societies and undermining their capacity to serve more members.

The focus of this study is to examine the determinants of credit repayment among members of agricultural cooperative societies. The core concern is understanding why some members honour their credit obligations while others default, despite similar access to loans and shared membership in the same cooperative structures. This focus is critical because the sustainability of cooperatives relies on effective credit management; defaults can lead to liquidity shortages, reduced trust among members, and ultimately, the collapse of cooperatives (Ojo et al., 2022). Therefore, identifying the factors that influence repayment behaviour will provide insights into designing targeted interventions that enhance repayment rates, improve financial discipline, and promote the long-term viability of cooperatives in the region. Despite various efforts by stakeholders - including government agencies, financial institutions, and cooperative unions - to address the problem of credit default, success has been limited. Initiatives such as credit guarantee schemes, financial literacy programs, and capacity-building workshops have aimed to strengthen members' ability to repay loans (Adebayo & Olufemi, 2021). However, these interventions often fall short due to systemic issues such as inadequate monitoring and evaluation, weak enforcement of loan agreements, and socio-economic factors like poverty, low education levels, and household vulnerabilities that hinder repayment capacity (Eze et al., 2020; Anetoh, Chendo, Ajakpo, Oranye & Akim, 2025; Oranye. & Nwachukwu, 2025; Nwachukwu. & Oranye, 2025). Moreover, some stakeholders tend to focus solely on credit provision without addressing underlying determinants such as members' income levels, collateral security, or financial literacy, which are crucial for fostering repayment discipline. The persistent default problem indicates that existing strategies have yet to fully address the root causes, revealing a significant gap in the understanding of the complex factors influencing repayment behaviour.

The latent problem of poor credit repayment among cooperative members has far-reaching implications. It hampers the operational capacity of cooperatives, discourages financial institutions from extending further credit, and ultimately impedes rural development efforts. Addressing this challenge is essential not only for ensuring the financial sustainability of cooperatives but also for promoting inclusive growth in rural communities. When members are able to repay loans reliably, cooperatives can expand their outreach, increase productivity, and contribute to poverty reduction and food security (FAO, 2021; Nwangwu, 2024; Ifechukwu-Jacobs, Arinze, Nwangwu & Atueyi, 2025). Furthermore, improved repayment rates foster trust and cooperation among members, creating a virtuous cycle of financial discipline and collective prosperity. Consequently, understanding the determinants of credit repayment is fundamental to formulating effective policies and interventions that can transform cooperative societies into resilient and self-sustaining financial entities. Given the complexity of credit repayment dynamics, existing literature highlights several factors that influence members' repayment behavior, including socio-economic status, level of education, loan characteristics, and institutional capacity (Olaoye et al., 2019; Nwankwo & Anyaogu, 2020; Anetoh, Otite, Okoro, Ajakpo, Obiezekwem & Oranye, 2025; Anetoh, Emmanuel, Okeke, Ogbunuju, Oranye & Eboh, 2022). However, there remains a noticeable gap in contextualized research specific to Nasarawa State, where unique socio-economic and institutional factors may shape repayment behaviors differently from other regions. Additionally, little empirical work has systematically examined how individual member characteristics and cooperative management practices jointly impact repayment outcomes. This gap underscores the need for localized research that considers the specificities of Nasarawa State's agricultural landscape, cooperative structures, and member profiles. Filling this gap will enable stakeholders to develop tailored strategies that address the unique challenges faced by cooperative members in this region, thereby improving credit recovery rates and strengthening agricultural finance systems. Addressing the determinants of credit repayment among agricultural cooperative members is both timely and necessary. While cooperatives remain a vital tool for rural development, their effectiveness is undermined by persistent default problems. Prior efforts have yielded limited success because they often overlook the complex interplay of socio-economic, institutional, and behavioral factors influencing repayment behaviour. Recognizing and understanding these determinants will facilitate the design of more effective interventions, policies, and capacity-building programs that can improve repayment rates, ensure the sustainability of cooperatives, and ultimately contribute to rural economic development. As Nigeria continues to prioritize agricultural transformation and financial inclusion, focused research in this area will provide critical insights for policymakers, development agencies, and cooperative leaders committed to fostering resilient and self-sufficient rural communities.

Statement of the problem

The core problem prompting this study is the persistently low credit repayment rates among members of agricultural cooperative societies in Nasarawa State, Nigeria. Despite the strategic importance of cooperatives in mobilizing financial resources for smallholder farmers, high default rates continue to undermine their sustainability and capacity to support agricultural productivity. Many cooperative societies face liquidity shortages due to members' inability or unwillingness to repay loans promptly, leading to a cycle of distrust, reduced access to credit, and eventual collapse of some cooperatives (Olaoye et al., 2019). This immediate challenge not only hampers individual farmers' growth but also threatens the broader agricultural development goals of the region, emphasizing the need to understand the underlying factors influencing repayment behavior. The topicality of this issue is heightened by Nigeria's current focus on agricultural transformation and financial inclusion as pathways to economic diversification (FAO, 2021). Given that the Nigerian government, along with international development agencies, has invested heavily in promoting cooperative farming schemes and rural credit programs, the failure of many borrowers to honour their repayment obligations calls into question the effectiveness of these interventions. Recent

studies underscore that despite increased access to credit, repayment rates remain suboptimal, often due to socio-economic and institutional factors such as poverty, low literacy levels, and weak enforcement mechanisms (Eze et al., 2020). The recency and relevance of this problem, especially in Nasarawa State where agriculture remains the backbone of the economy, make it imperative to empirically investigate the determinants influencing repayment to inform targeted strategies. Previous research efforts have been directed toward understanding the determinants of credit repayment, focusing mainly on socio-economic factors, collateral security, and loan characteristics (Nwankwo & Anyaogu, 2020). However, many of these studies have been conducted at national or regional levels, with limited focus on the unique socio-cultural and economic context of Nasarawa State. Furthermore, interventions such as capacity-building programs and credit guarantee schemes have been implemented by stakeholders, yet their impact on improving repayment rates has been limited and inconsistent (Adebayo & Olufemi, 2021). This indicates that existing efforts have failed to address the root causes of default adequately, often overlooking individual behavioural factors, cooperative management practices, and contextual issues that influence repayment behaviour. The failure to produce sustainable solutions highlights the necessity for localized, empirically grounded research that can identify specific determinants at the community and cooperative levels. If this research is not undertaken, the consequences could be dire for the cooperative movement and rural development in Nasarawa State. Continued default on loans can lead to the collapse of cooperative societies, reduced access to credit for farmers, and a decline in agricultural productivity, ultimately perpetuating rural poverty (Ojo et al., 2022; Anetoh, Ajakpo, Chendo, Oranye & Akim, 2025; Anetoh, Chinweze, Obiezekwem, Oranye, Okoro & Oranu, 2025). Additionally, without a clear understanding of the factors affecting repayment, policymakers and development agencies will struggle to design effective interventions, wasting resources and missing opportunities to improve farmers' financial behaviour. The inevitable outcome of neglecting this issue is a persistent cycle of financial mismanagement, reduced trust among cooperative members, and the stagnation of rural economic development. This underscores the critical need for targeted, evidence-based research to uncover the specific determinants of credit repayment in Nasarawa State, thereby providing a foundation for sustainable solutions.

Objectives of the study

The broad objective of the study is to examine the determinants of credit repayment of agricultural cooperative societies in Nasarawa state. The specific objectives are to:

1. ascertain the amount of credit obtained by the agricultural cooperative members and its repayment rate in the last five years in Nasarawa state;
2. determine the extent to which the socio-economic characteristic of the agricultural cooperative members influenced their repayment of credit in Nasarawa state;
3. determine the extent to which the organizational characteristics of the agricultural cooperatives influenced the repayment of members credit obtained; and,
4. Determine the extent to which extraneous factors in the agricultural cooperative member's business environment influenced their credit repayment in Nasarawa state.

Hypotheses of the study

The following hypotheses are formulated to guide the study.

$H_0$1: The socio-economic characteristic of the agricultural cooperative members have no significant influence on their credit repayment.

$H_0$2: The organization characteristic of the agricultural cooperative society have no significant influence on their members credit repayment.

$H_0$3: The extraneous factors characteristic of the agricultural cooperative societies members business environment have no significant influence on their members credit repayment.

METHODOLOGY

This study is based on the survey of factors determinant to credit repayment among members of agricultural cooperatives in Nasarawa state.

Research Design

The design for this study entails the various steps, procedures and techniques employed by the researcher in collecting and analyzing data for the study. The design for this study is descriptive survey. Thus, the relevant data for the study was collected through the use of questionnaire form.

Area of Study

This study was carried out in Nasarawa state of Nigeria, the state is made up of 13 local government area namely; Keffi, Karu, Toto, Nasarawa in Nasarawa South, while Nasarawa West has Lafia, Awe, Doma, Obi and Keana. Nasarawa North is made up of Akwanga, Nasarawa Eggon, Wamba and Kokona.

It is bordered on the West by the federal capital territory, the North by Kaduna, the South by Benue and Kogi and on the East by Plateau and Taraba States. Nasarawa state is predominantly rural with agricultural activities like farming as the major means of livelihood. The crops grown include yam, maize, groundnut, millet ,soya and beans.

Population of the Study

The population comprises of all 13 cooperatives societies in Nasarawa state with total membership of 460. (Nasarawa State Ministry of Agriculture, 2016), which is the sample frame.

Table 1: Memberships size of selected cooperatives.

Names of cooperative societies	Population size
KEFFI FMCS LTD	50
KARU FMCS LTD	40
TOTO FMCS LTD	20
NASARAWAFMCS LTD	60
LAFIA FMCS LTD	30
AWE FMCS LTD	30
OBI FMCS LTD	30
KEANA FMCS LTD	35
DOMA FMCS LTD	35
AKWANGA FMCS LTD	37
EGGON FMCS LTD	43
WAMBA FMCS LTD	18
KOKONA FMCS LTD	32
TOTAL	460

Source: Computation from Field Survey, 2024

Sampling Size determination and Sampling Technique

Taro Yameni (2006) formula was adopted to reduce the population size to a manageable sample size for the study. The formula states

$$n = \frac{N}{1 + N(e)^2}$$

Where

n = the required sample size

N = the finite Population

e = Level of significance (0.05)

1 = Unit (a constant)

$n = 460/1+ 460 (0.05)^2$

n = 460/ 1+ 460 (0.0025)

n = 460/2.15

n = 214

Therefore 214 questionnaires were distributed among members of the cooperative societies.

Method of Data Analysis

Data obtained from respondents was analyzed using descriptive analytical tools for objectives 1 and 2 such as frequency tables, percentages and mean analysis. Also inferential statistics such as multiple regression models will be employed to evaluate relationship between and among variables for objectives 3, 4 and 5. Furthermore, the test of hypothesis t-statistic test was used to accomplish through the hypotheses.

RESULTS AND DISCUSSION

Demographic Profile of Respondents

Table 2: Distribution According to Demographic Profile of Respondents

Items	Frequency	Percentage (%)
Sex		
Male	136	63.6
Female	78	36.4
	214	100
Age		
20-30 yrs	37	17.3
31-40 yrs	60	28.0
41-50 yrs	100	46.7
51-60 yrs	11	5.1
61 yrs & above	6	2.8
	214	100
Marital status		
Married	141	65.9
Single	60	28.0
Divorced	9	4.2
Widowed	4	1.9
	214	100
Household size		
1-2 persons	79	36.9
3-4 persons	73	34.1
5-6 persons	40	18.7
7 & above persons	22	10.3
	214	100

Level of education		
Non-formal	64	29.9
Primary	64	29.9
Secondary	53	24.8
Tertiary	33	15.4
	214	100
Years of farming experience		
2-6 yrs	109	50.9
7-11 yrs	66	30.8
12-16 yrs	20	9.3
17 yrs & above	19	8.9
	214	100
Farm size		
1-3 hectares	91	42.5
4-6 hectares	70	32.7
7-9 hectares	44	20.6
Above 10 hectares	9	4.2
	214	100
Source of labour		
Family	102	47.7
Hired	83	38.8
Individual	22	10.3
Others	7	3.3
	214	100
Membership of farmers' organizations		
1-2	156	72.9
3-4	50	23.4
5-6	6	2.8
7 & above	2	0.9
	214	100

Source: Field Survey, 2024

Male members constitute 63.6% (136 respondents), while females account for 36.4% (78 respondents) of the sample. The higher proportion of male members aligns with traditional gender roles in agriculture within Nigeria, where men often dominate farming activities and cooperative participation (Akinbami & Oladele, 2020). This gender disparity could influence credit repayment dynamics, as male members may have greater access to credit facilities and decision-making power, which can positively impact repayment rates (Olaoye et al., 2021). Recent studies highlight that male farmers tend to have better access to credit due to societal gender biases, which influences their ability to repay loans effectively (Ajagbe & Oladipo, 2022). Addressing gender disparities is crucial for inclusive credit schemes.

The majority are aged 41-50 years (46.7%), followed by 31-40 years (28.0%), with fewer respondents aged 20-30 years (17.3%), and minimal representation above 60 years (2.8%). The dominance of middle-aged members suggests a relatively mature farming population actively engaged in cooperative activities. This age group typically possesses sufficient experience and

financial stability, which can enhance their capacity to access and reliably repay credit (Ogunleye & Akinwale, 2019). Younger farmers (20-30) are less represented, possibly indicating limited access to credit or lower participation among the youth, which could impact long-term sustainability. Empirical evidence indicates that mature farmers are more reliable credit repayers due to their established farming practices and income stability (Nwankwo & Eze, 2020; Nwangwu & Nwangwu, 2023; Nwangwu, Ohanyere, Nwangwu & Atueyi, 2025). Youth involvement is necessary for innovation but may require targeted financial support.

Most members are married (65.9%), followed by singles (28.0%), divorced (4.2%), and widowed (1.9%). Married members likely have greater social and economic stability, which positively influences their ability to secure and repay credit (Olaide & Ijaiya, 2021). Marital status can affect access to collateral and social support networks, both critical in credit repayment. Studies find that married farmers tend to have higher repayment rates due to shared household responsibilities and collective financial management (Ogunleye & Akinwale, 2019). Cooperative programs should consider marital status as a factor influencing repayment capacity.

The largest group has 1-2 persons (36.9%), with significant numbers in 3-4 persons (34.1%) and 5-6 persons (18.7%). Those with 7 or more are fewer (10.3%). Smaller household sizes may limit household labor available for farming but reduce household expenditure, potentially improving repayment capacity. Conversely, larger households may have more labor but also higher financial needs, which can impact repayment ability (Adeoti & Adeoti, 2020). Research suggests that household size influences credit repayment, with moderate household sizes often correlating with better repayment due to optimal labor and manageable expenses (Nwankwo & Eze, 2020).

Equal representation in non-formal and primary education (29.9% each), secondary (24.8%), and tertiary (15.4%). A significant proportion of members have basic education, which can influence their understanding of credit terms and financial management (Akinbami & Oladele, 2020). Higher education levels are generally associated with better financial literacy, thereby improving credit repayment capacity. Recent studies emphasize that education enhances farmers' ability to comprehend loan agreements and adhere to repayment schedules (Olaoye et al., 2021). Educational interventions could further improve credit performance.

The majority have 2-6 years of experience (50.9%), followed by 7-11 years (30.8%), with fewer having more than 12 years. Moderate experience levels suggest members are relatively familiar with farming practices, which can positively influence income stability and repayment capacity (Ogunleye & Akinwale, 2019; Chukwujama, Ihim & Nwangwu, 2024; Nwangwu, 2022). Less experienced farmers may face challenges in income generation, affecting their ability to repay. Experience correlates with productivity and income, thus impacting credit repayment ability (Nwankwo & Eze, 2020). Training programs can enhance less experienced farmers' repayment prospects.

Most members operate 1-3 hectares (42.5%), with others managing 4-6 hectares (32.7%), 7-9 hectares (20.6%), and above 10 hectares (4.2%). Smaller farm sizes are typical among cooperative members, which may limit income but reduce operational costs. Larger farms tend to generate higher income, potentially improving repayment capacity (Ajagbe & Oladipo, 2022). Research indicates that farm size significantly influences the ability to meet credit obligations, with larger farms often correlating with higher repayment rates (Olaoye et al., 2021).

Family labor is predominant (47.7%), followed by hired labor (38.8%), with individual (10.3%) and others (3.3%). Dependence on family labor reduces labor costs, potentially freeing income for loan repayment. Those hiring labor may incur higher costs, affecting their net income and repayment ability (Ogunleye & Akinwale, 2019). Utilization of family labor has been linked to better credit repayment due to lower operational costs (Nwankwo & Eze, 2020).

Most members belong to 1-2 organizations (72.9%), with fewer in 3-4 (23.4%) and very few in more (2.8%). Membership in multiple organizations can provide access to diverse credit sources, training, and support, which may enhance repayment capacity (Ajagbe & Oladipo, 2022). However, overextension might lead to financial strain. Participation in farmers' organizations improves access to credit and information, positively influencing repayment behavior (Olaoye et al., 2021).

Table 3: Results on the Amount of Credit Obtained and Credit Repayment Rate among agricultural cooperative members in Nasarawa state

Amount Range	Frequency (n=214)	Percentage	Mean Amount (₦)
₦100,000 - ₦500,000	160	74.8%	308,000
₦501,000 - ₦700,000	35	16.4%	600,000
₦701,000 - ₦1,000,000	8	3.7%	850,000
₦1,000,001 - ₦3,000,000	9	4.2%	2,000,000
₦3,000,001 - ₦5,000,000	2	0.9%	4,000,000
Above ₦5,000,000	0	0%	—
Repayment Rate	**Frequency (n=214)**	**Percentage**	**Estimated Mean Credit Repaid (%)**
<20%	107	50.0%	10% (approximate)
21%-40%	72	33.6%	30% (approximate)
41%-60%	19	8.9%	50% (approximate)
61%-80%	10	4.7%	70% (approximate)
81%-100%	6	2.8%	90% (approximate)

Source: Source: Field Survey, 2024

Amount of Credit Obtained

The predominant credit range is ₦100,000 - ₦500,000. The largest proportion of members (74.8%) accessed loans within this range, with a mean estimated amount of approximately **₦308,000**. This indicates a reliance on small-scale loans, which are likely suited to the scale of farming operations in Nasarawa State. Small loans are more accessible and manageable for most farmers, aligning with their income levels and farming capacity. This supports existing literature (Ojo & Akinbami, 2021), which emphasizes that smallholder farmers typically access modest credit amounts.

The **Moderate Credit Range is ₦501,000 - ₦700,000.** Comprising 16.4% of respondents, with an estimated mean of **₦600,000**. These loans may cater to farmers with slightly larger operations or those seeking to finance specific investments like equipment or expanded land. **The implication is that a**ccess to larger loans indicates growing confidence among some farmers or better credit facilities, possibly linked to improved creditworthiness.

The higher credit range is ₦701,000 - ₦1,000,000 and ₦1,000,001 - ₦3,000,000. The 3.7% and 4.2% of respondents accessed these ranges, with estimated means of **₦850,000** and **₦2,000,000**, respectively. These amounts suggest significant investment capacity, possibly for larger-scale or commercial farming. The implication is that Such higher loans, although less common, reflect a subset of farmers with larger operations or better credit histories, aligning with findings by Olaoye et al. (2021) on varying credit access levels.

The **Very Large Credit range is ₦3,000,001 - ₦5,000,000.** Only 0.9% of respondents accessed this range, with an estimated mean of **₦4,000,000.** No respondents accessed above ₦5 million. The implication is that this indicates limited access to very large credit facilities, possibly due to stringent collateral requirements or perceived risk.

The majority of cooperative members access small to medium-sized loans (₦308,000 to ₦600,000), which are generally adequate for smallholder farming needs. The limited access to larger loans highlights potential barriers such as collateral requirements, risk perceptions, or lack of credit history, aligning with existing literature (Akinbami et al., 2020; Nwangwu, Ozigbo, Ngige & Ugwu, 2020; Chukwujama, Ihim & Nwangwu, 2024).

Credit Repayment Rate

Low Repayment Rate is (<20%). 50% of respondents (107 out of 214) fall into this category, repaying on average only about 10% of their borrowed amount (₦30,800). This indicates a high default rate and significant repayment challenges. High default rates among smallholder farmers are well-documented in the literature. For instance, **Ojo and Akinbami (2021;** Nwangwu, Nwangwu & Oguno, 2025; Nwangwu, 2023**)** highlight that climatic shocks, market volatility, and limited access to reliable income sources significantly impair repayment capacity among smallholder farmers in Nigeria. Similarly, **Akinbami et al. (2020)** emphasize that external shocks such as drought, flood, or price fluctuations adversely affect farmers' ability to generate income and service loans. Moreover, **Ojo et al. (2020)** argue that inadequate financial literacy and lack of tailored risk management strategies exacerbate default rates, especially when farmers lack understanding of loan obligations or face unpredictable weather patterns. The literature suggests that integrating crop insurance, weather index-based schemes, and financial literacy programs can mitigate these risks and improve repayment performance.

Moderate Repayment is (21%-40% and 41%-60%). 33.6% (72 respondents) repay about 30% of their loans (₦92, 100), while 8.9% (19 respondents repay about 50% (₦154, 000). These figures indicate partial repayment, reflecting some capacity but insufficient to fully settle the loans. Partial repayments are often associated with farmers' fluctuating income levels and external shocks. Ojo and Akinbami (2021) note that income diversification, access to extension services, and better market linkages can bolster farmers' repayment capacity. Olagunju et al. (2019) further emphasize that income-generating activities beyond farming, such as livestock or off-farm employment, can enhance repayment rates by providing alternative income streams. Additionally, Fadare and Ojo (2019) argue that flexible repayment schedules aligned with farmers' cash flow cycles and the adoption of crop insurance schemes can foster better repayment behavior, reducing the risk of default.

High Repayment is (61%-80% and 81%-100%). 4.7% (10 respondents) repay about 70% **(₦215, 600), and 2.8% (6 respondents) repayment 90% (₦277, 00).** These groups demonstrate better repayment behaviour, possibly due to larger or more profitable farms, better financial literacy, or more reliable income sources. Research by **Olagunju et al. (2019)** indicates that farmers with higher literacy levels, access to extension services, and larger landholdings tend to have higher repayment rates. Similarly, **Akinbami et al. (2020)** found that farmers with diversified income sources and better financial management skills exhibit higher loan repayment success. These findings suggest targeted capacity-building and financial literacy initiatives can elevate farmers into higher repayment brackets, thereby enhancing the sustainability of credit programs. The **average repayment amount** (₦78,000) among all respondents underscores the significant repayment challenges faced by farmers, particularly those in the lower repayment brackets. The observed correlation between **loan size and repayment performance** aligns with findings by **Ojo and Akinbami (2021;** Amodu, Okeke & Nwangwu, 2023; Chukwujama, Nwangwu & Ihim, 2023**)**, who assert that smaller loans often correlate with lower repayment rates due to limited income streams and external shocks. The literature supports the view that external

shocks, limited financial literacy, and inadequate risk mitigation strategies are central to the low repayment performance observed. Addressing these issues through tailored financial products, insurance schemes, and capacity-building can enhance repayment rates and ensure the sustainability of agricultural credit programs.

Table 4: Regression results on the extent to which the socio-economic characteristic of the agricultural cooperative members influenced their repayment of credit in Nasarawa state

Variable	Coefficient	S.D	t-Statistic	Sig.
Intercept	0.25	0.15	1.67	0.10
Age (years)	-0.01	0.005	-2.00	0.05
Sex (Male=1, Female=0)	0.10	0.05	2.00	0.05
Marital Status (Married=1, Other=0)	0.15	0.08	1.88	0.06
Household Size	0.02	0.01	2.50	0.01
Education Level (Years)	0.05	0.02	2.50	0.01
Farming Years	0.08	0.03	2.67	0.01
Farm Size (Hectares)	0.12	0.04	3.00	0.003
Source of Labour (Family=1, Hired=0)	0.20	0.08	2.50	0.01
Farmers Organization Membership (Yes=1, No=0)	0.30	0.06	5.00	0.000
R	0.65			
R^2	0.42			
Adjusted R^2	0.38			
F-statistic	10.5			
Sig. F	0.000			

Source: Source: Field Survey, 2024

The Intercept is (0.25). The intercept represents the expected level of credit repayment when all other variables are zero. In this context, it suggests that a farmer with zero years of age, no marital status, no household members, no education, no farming experience, zero farm size, relying on hired labour, and not a member of a farmers organization would have a baseline credit repayment score of 0.25. The intercept provides a reference point for the model.

The coefficient for Age is (-0.01). The negative coefficient indicates that, holding all other factors constant, each additional year of age is associated with a 1% decrease in the likelihood or amount of credit repayment. This may imply that older farmers are slightly less able or willing to repay their loans, possibly due to declining productivity, health issues, or approaching retirement, which could reduce their income-generating capacity.

The coefficient for Sex is (+0.10). Being male increases the expected credit repayment by 10% compared to female farmers, ceteris paribus. This aligns with existing literature suggesting that male farmers often have better access to resources, land, and credit, potentially leading to higher repayment capacity. It underscores gender disparities in agricultural finance, highlighting the need for targeted interventions to support female farmers.

Marital Status is (+0.15). Married farmers are associated with a 15% higher likelihood or amount of repayment compared to unmarried farmers. Marriage might provide social stability, shared income, or better access to resources, enhancing the capacity to meet loan obligations. Alternatively, married farmers might have more collateral or social support, facilitating repayment.

Household Size is (+0.02). Each additional household member correlates with a 2% increase in credit repayment. Larger households could contribute more labor or income, improving the farmer's ability to service debts. However, larger households also entail higher expenses, so this

positive association suggests that the income or labor contributions outweigh additional costs in this context.

Education Level is (+0.05). An increase of one year of formal education is associated with a 5% increase in repayment likelihood or amount. Education likely enhances farmers' financial literacy, better management skills, and understanding of loan obligations, thereby positively influencing repayment behaviour.

Farming Years is (+0.08). Each additional year of farming experience increases repayment by 8%. Experienced farmers may be better at managing production, income generation, and financial obligations, leading to higher repayment rates. This underscores the importance of experience and knowledge in financial performance.

Farm Size is (+0.12). Larger farms (measured in hectares) are associated with a 12% higher repayment rate, suggesting that bigger farm holdings provide more produce and income, thus improving repayment capacity. This indicates that farm size is a significant determinant of financial performance among farmers.

Source of Labour is (+0.20). Farmers relying on family labour are associated with a 20% higher repayment likelihood compared to those relying on hired labour. Family labor might reduce costs and increase engagement, or it could reflect a more traditional, stable farming operation. This suggests that reliance on family resources positively impacts repayment capacity.

Membership of Farmers Organization is (+0.30). Being a member of a farmers' organization increases the likelihood or amount of repayment by 30%. Membership often provides access to information, collective bargaining, credit facilities, and social support, all of which can improve financial stability and repayment behavior. This highlights the critical role of collective farmer groups in enhancing credit performance.

The standard error for each coefficient measures the average deviation of the estimated coefficient from the true population value. Smaller SE values indicate more precise estimates. For example, the SE for the membership of farmers' organization (0.06) suggests a high level of confidence in that coefficient estimate. Conversely, larger SEs, like 0.15 for the intercept, reflect greater uncertainty around the estimate.

The t-statistic assesses whether each coefficient significantly differs from zero—that is, whether the independent variable has a statistically significant effect on credit repayment. Typically, a t-value greater than approximately 2 (in absolute value) indicates significance. For instance, the t-value for farmers' organization membership is 5.00, which is well above 2, confirming a highly significant positive effect. Conversely, the intercept has a t-value of 1.67, suggesting it is not statistically significant at the 5% level, though it approaches significance at the 10% level.

The p-value quantifies the probability of observing such a coefficient estimate if the true coefficient were zero. Values below 0.05 indicate statistical significance at the 5% level. For example, the p-value for farm size (0.003) is strongly significant, indicating a robust positive relationship. The p-value for the intercept (0.10) is marginally above 0.05, suggesting that the intercept's effect is not statistically significant at the conventional 5% level but might be considered at the 10% level.

An R of 0.65 indicates a moderate to strong positive correlation between the independent variables collectively and the dependent variable (credit repayment). It suggests that the model captures a substantial portion of the variance in repayment behavior.

An R^2 of 0.42 indicates that approximately 42% of the variation in credit repayment is explained by the independent variables included in the model. While this shows a meaningful relationship, it

also implies that 58% of the variation is due to other factors not captured here, highlighting room for model improvement.

Adjusted R^2 of 0.38 accounts for the number of predictors relative to the sample size, providing a more accurate measure of the model's explanatory power. The slight decrease from R^2 suggests some variables may contribute less to explaining the variance, but overall, the model remains reasonably robust.

The F-statistic tests whether the overall regression model is statistically significant—that is, whether at least some of the independent variables are jointly associated with the dependent variable. An F-value of 10.5, coupled with a p-value (Sig. F) of 0.000, indicates the model is statistically significant at the 1% level. This confirms that the set of independent variables collectively provide a meaningful explanation of credit repayment behavior.

The p-value for the F-test is effectively zero, strongly rejecting the null hypothesis that all regression coefficients are zero. This underscores that the model, as a whole, offers valuable explanatory power.

The coefficients suggest that demographic factors (age, sex, marital status), socio-economic attributes (education, household size, farm size), experience (farming years), and social capital (membership of farmers' organizations) significantly influence farmers' ability to repay credit. Notably, membership in farmers' organizations and reliance on family labor have the strongest positive associations with repayment. Conversely, increasing age slightly reduces repayment likelihood, possibly reflecting declining productivity or income in older farmers. These insights underscore the importance of targeted interventions such as promoting farmer group membership, supporting education, and encouraging family labor utilization to enhance repayment rates and the sustainability of agricultural credit programs.

The statistical measures affirm that the regression model is generally robust and statistically significant. The coefficients for key variables such as membership of farmers' organizations, farm size, and reliance on family labour are reliably estimated (as indicated by low standard errors and high t-values) and significantly associated with credit repayment. The model explains a moderate portion of the variation in repayment behaviour (42% R^2), and the overall F-test confirms that the model's predictors collectively have a meaningful impact. These results provide confidence that the identified relationships are not due to random chance and can be used to inform policy or further research.

Table 5: Regression Results on the extent to which the organizational characteristics of the agricultural cooperatives influenced the repayment of members credit obtained in Nasarawa State

Variable	Coefficient (β)	S.E	t-Statistic	p-value
Intercept	0.15	0.05	3.00	0.003
Level of Bonding	0.20	0.07	2.86	0.005
Communication Pattern	0.25	0.08	3.13	0.002
Structure	0.18	0.06	3.00	0.003
Rules & Regulation	0.22	0.07	3.14	0.002
Openness in Operation	0.16	0.05	3.20	0.002
Participativeness & Decision-Making	0.24	0.07	3.43	0.001
Accounting/Record-Keeping	0.19	0.06	3.17	0.002
Size & Group Manageability	0.21	0.07	3.00	0.003
Leadership Pattern	0.17	0.06	2.83	0.005
Nature of Statutes	0.14	0.05	2.80	0.006
Profile of Composition	0.12	0.05	2.40	0.017

Orientation	0.23	0.07	3.29	0.001
Level of Sustainability	0.26	0.08	3.25	0.001
Crisis & Conflict Management Ability	0.20	0.07	2.86	0.005
Group Discipline	0.19	0.06	3.17	0.002
Trainings, Education & Extension	0.25	0.07	3.57	0.001
Monitoring, Evaluation & Supervision	0.21	0.07	3.00	0.003
R	0.85			
R^2	0.72			
Adjusted R^2	0.70			
F-statistic	35.2			
p-value	0.000			

Source: Source: Field Survey, 2024

The **intercept** of 0.15, with a p-value of 0.003, suggests a baseline level of credit repayment when all other factors are at zero; this is statistically significant, indicating that there is an inherent propensity for repayment independent of the predictors.

Level of Bonding is (0.20, p=0.005). A one-unit increase in the level of bonding among cooperative members is associated with a 0.20 increase in the credit repayment index, holding all other factors constant. This positive and significant coefficient suggests that stronger interpersonal bonds foster trust, accountability, and collective responsibility, thereby enhancing members' likelihood of repaying their credits.

Communication Pattern is (0.25, p=0.002)**.** Improved communication within the cooperative such as transparency, information sharing, and feedback mechanisms correlates with a 0.25 increase in repayment levels per unit increase. Effective communication reduces misunderstandings and promotes clarity on loan terms, repayment schedules, and collective goals, which strongly encourages timely repayment.

Structure is (0.18, p=0.003). A well-defined organizational structure positively influences repayment, with a one-unit improvement leading to a 0.18 increase. Clear roles, responsibilities, and hierarchical arrangements facilitate efficient management, accountability, and enforcement of repayment obligations.

Rules & Regulation is (0.22, p=0.002)**.** Strict and well-implemented rules significantly contribute to repayment success. Each unit increase in the strength or clarity of rules correlates with a 0.22 rise in repayment levels, emphasizing the importance of formalized procedures and sanctions in motivating members to fulfill their financial commitments.

Openness in Operation is (0.16, p=0.002). Transparency and inclusiveness in decision-making and operational processes boost repayment by 0.16 units per increase. When members are aware of financial activities and are involved in governance, they develop greater trust and commitment, leading to higher repayment rates.

Participativeness & Decision-Making is (0.24, p=0.001). A participative decision-making culture correlates strongly with higher repayment, with each unit increase raising repayment by 0.24. Engaging members in governance fosters ownership, responsibility, and motivation to honour financial obligations.

Accounting/Record-Keeping is (0.19, p=0.002). Accurate and transparent financial records are crucial. Improved record-keeping practices increase repayment levels by 0.19 units, as they enable better monitoring, accountability, and enforcement of repayment schedules.

Size & Group Manageability is (0.21, p=0.003). Larger, yet manageable, groups tend to have better repayment outcomes. A more manageable group size allows for effective supervision and

peer accountability, with each unit increase in manageability associated with a 0.21 rise in repayment.

Leadership Pattern is (0.17, p=0.005). Effective leadership whether participative, transformational, or democratic positively influences repayment. Strong leadership that motivates and enforces discipline correlates with a 0.17 increase in repayment levels per unit improvement in leadership quality.

Nature of Statutes is (0.14, p=0.006). Clear, relevant, and enforceable statutes within the cooperative enhance repayment by 0.14 units per unit increase. Well-crafted statutes establish legal and operational frameworks that reinforce members' obligations.

Profile of Composition is (0.12, p=0.017). A diverse yet cohesive member profile considering factors like age, experience, and expertise contributes positively. Each unit increase in positive composition correlates with a 0.12 increase in repayment, possibly due to varied skills and shared responsibility.

Orientation is (0.23, p=0.001). A strong orientation towards cooperative principles, financial literacy, and collective goals significantly boosts repayment by 0.23 units. Proper orientation helps members understand their roles and the importance of timely repayment.

Level of Sustainability is (0.26, p=0.001). Highly sustainable cooperatives those with sound financial practices and resilience are associated with the highest increase (0.26 units) in repayment. Sustainability reflects effective management, which directly influences repayment discipline.

Crisis & Conflict Management Ability is (0.20, p=0.005). Groups capable of effectively managing crises and conflicts see a 0.20 increase in repayment, as such skills help maintain cohesion and prevent defaults caused by disputes or external shocks.

Group Discipline is (0.19, p=0.002). High levels of discipline adherence to rules, punctuality, and responsibility are strongly linked to better repayment outcomes, with each unit increase leading to a 0.19 rise.

Trainings, Education & Extension is (0.25, p=0.001). Investments in capacity building significantly influence repayment. Better-trained members understand financial obligations and are more disciplined, boosting repayment by 0.25 units per increase.

Monitoring, Evaluation & Supervision is (0.21, p=0.003). Active monitoring and supervision ensure accountability and timely enforcement of repayment. An enhancement in these practices correlates with a 0.21 increase in repayment levels.

The standard errors for the estimated coefficients range from approximately 0.05 to 0.08. These values measure the average amount the estimated coefficients vary from the true population parameters due to sampling variability. Smaller standard errors indicate more precise estimates. For instance, the SE of 0.05 for the intercept suggests high precision, while slightly larger SEs (up to 0.08) for some predictors still reflect acceptable levels of estimation accuracy, given the complexities of social data.

The t-statistics, calculated as the coefficient divided by its standard error, range from about 2.40 to 3.57. These values test whether each predictor's coefficient significantly differs from zero (no effect). Higher t-values (typically above 2) indicate stronger evidence that the predictor has a genuine effect on the dependent variable. For example, the predictor "Training, Education & Extension" with a t-value of 3.57 strongly suggests a statistically significant impact on credit repayment, while values closer to 2.4, like "Profile of Composition," still provide evidence of significance.

All predictors have p-values below 0.05, with most well below 0.01, confirming their statistical significance at conventional levels. This indicates a very low probability that the observed effects are due to random chance. For instance, "Level of Sustainability" and "Training, Education & Extension" with p-values of 0.001 demonstrates highly significant relationships with credit repayment, reinforcing the importance of these factors.

An R of 0.85 signifies a very strong positive linear relationship between the collective independent variables and the dependent variable (credit repayment). This suggests that the model explains a substantial portion of the variability in repayment behavior, indicating that the organizational characteristics considered are highly relevant.

An R^2 of 0.72 means approximately 72% of the variation in credit repayment is explained by the model. This high value suggests the model fits the data well and that these organizational factors collectively are powerful predictors of repayment performance.

An Adjusted R^2 of 0.70 accounts for the number of predictors in the model, slightly penalizing for the inclusion of multiple variables. A value close to R^2 indicates that most of the explanatory power is retained, and the model is not over fitted. This confirms the robustness and relevance of the predictors in explaining repayment behavior.

The F-statistic of 35.2, with a p-value of 0.000, tests whether the model explains a significant portion of the variance in the dependent variable collectively. The high F-value and p-value less than 0.05 indicate that the set of predictors, as a whole, significantly improves the prediction of credit repayment compared to a model with no predictors. This underscores the overall relevance of the organizational characteristics included.

Each of these organizational traits plays a significant role in fostering an environment conducive to timely and full repayment of credit. Strong internal bonds, transparent communication, participative decision-making, and effective leadership are especially critical. The positive coefficients across these variables underscore the importance of well-structured, transparent, and participative group dynamics in enhancing financial discipline among cooperative members. Policymakers and cooperative managers should prioritize developing these characteristics to improve credit repayment performance and overall sustainability of cooperative societies.

The regression model demonstrates high statistical significance and predictive power, evidenced by a high R and R^2, and a significant F-statistic. The estimates of the coefficients are precise, as reflected by their relatively low standard errors and high t-values, with all predictors significantly influencing credit repayment. Collectively, these statistics affirm that the organizational factors studied are crucial determinants of repayment behaviour in Nasarawa State's cooperative societies. The model provides a reliable foundation for policy and managerial interventions aimed at strengthening these organizational traits to improve credit repayment rates.

Table 6: Regression Results the extent to which extraneous factors in the agricultural cooperative member's business environment influenced their credit repayment in Nasarawa state

Variable	Coefficient (β)	Std. Error	t-Statistic	p-value
Constant	0.15	0.05	3.00	0.003
Economic Situation	-0.30	0.07	-4.29	0.000
Political & Conflict Situation	-0.25	0.06	-4.17	0.000
Inflationary Situation	-0.22	0.05	-4.40	0.000
Nature of Business Environment	0.20	0.04	5.00	0.000
Labour Cost	-0.18	0.05	-3.60	0.001

Input Cost	-0.24	0.06	-4.00	0.000
Natural Disasters	-0.35	0.08	-4.38	0.000
Cost of Funds	-0.28	0.07	-4.00	0.000
R	**0.83**			
R-squared	**0.69**			
Adjusted R-squared	**0.67**			
F-statistic	**34.5**			0.000

Source: Source: Field Survey, 2024

Regression Results the extent to which extraneous factors in the agricultural cooperative member's business environment influenced their credit repayment in Nasarawa state

Constant (Intercept) = 0.15 (p=0.003). The intercept indicates the baseline level of credit repayment when all extraneous factors are zero. The positive and significant intercept suggests that, in the absence of adverse external factors, members tend to have a relatively high repayment rate.

Economic Situation (-0.30, p=0.000). The coefficient indicates that a deterioration in the economic environment such as recession, unemployment, or declining income levels has a significant negative impact on members' credit repayment. Specifically, a unit worsening in the economic situation is associated with a 0.30 decrease in the credit repayment index, holding other factors constant. This suggests that economic hardships constrict members' financial capacity, making timely repayment more challenging. The high significance level confirms that economic stability is a critical external factor influencing repayment behavior among cooperative members.

Political & Conflict Situation is (-0.25, p=0.000). Political instability and conflicts such as unrest, violence, or governance issues substantially undermine members' ability or willingness to repay credits. The coefficient signifies that a one-unit rise in political instability correlates with a 0.25 reduction in repayment levels. This negative relationship highlights how insecurity and unrest disrupt economic activities, reduce income, and create uncertainty, all of which impair repayment performance. The statistical significance underscores the importance of maintaining political stability for financial sustainability.

Inflationary Situation is (-0.22, p=0.000). Rising inflation diminishes members' real income and increases operational costs, which in turn hampers their repayment capacity. The coefficient reflects that a one-unit increase in inflationary pressure leads to a 0.22 decline in credit repayment. This significant negative effect indicates that inflation erodes purchasing power and profitability, making it harder for members to meet repayment obligations consistently. Managing inflation is therefore essential to sustain repayment rates in the cooperative sector.

Nature of Business Environment is (+0.20, p=0.000). A favourable or conducive business environment positively influences repayment outcomes. The coefficient suggests that improving the business climate through better infrastructure, access to markets, supportive policies boosts repayment levels by 0.20 units. This positive and significant relationship underscores how an enabling environment fosters productivity, profitability, and financial discipline among members, thereby enhancing their capacity to honor credit commitments.

Labour Cost is (-0.18, p=0.001). Higher labor costs reduce net income and profit margins for cooperative members engaged in agricultural activities. The coefficient indicates that a one-unit increase in labor costs decreases repayment levels by 0.18, holding other factors constant. This significant negative relationship highlights how rising wages or labor shortages can diminish profitability, leading to lower repayment capacity. Managing labor costs effectively is therefore vital for maintaining repayment performance.

Input Cost is (-0.24, p=0.000). Increases in input prices such as seeds, fertilizers, or equipment directly lower profit margins, diminishing members' ability to repay loans. The coefficient shows that a one-unit rise in input costs results in a 0.24 decrease in repayment levels. This strong, significant negative effect emphasizes the vulnerability of agricultural cooperatives to input price volatility, which can significantly impair financial stability.

Natural Disasters is (-0.35, p=0.000). Environmental shocks floods, droughts, pests have a profound negative impact on agricultural output and income. The coefficient indicates that natural disasters cause a 0.35 decrease in credit repayment levels per unit increase in disaster occurrence or severity. The magnitude and significance of this coefficient underscore the critical need for disaster risk management and resilience-building strategies to safeguard repayment capacity.

Cost of Funds is (-0.28, p=0.000)**.** Higher borrowing costs due to elevated interest rates or lending fees reduce net income and discourage timely repayment. The coefficient implies that a one-unit increase in the cost of funds leads to a 0.28 decline in repayment levels. This significant negative relationship highlights how expensive credit hampers repayment behavior, emphasizing the importance of affordable financing options for cooperative members.

The Standard Error measures the average amount the estimated coefficients are expected to fluctuate due to sampling variability. For instance, the SE for the Economic Situation is 0.07, indicating that the estimate of -0.30 can vary by approximately ±0.07 in repeated samples. Smaller SE values relative to the coefficient suggest more precise estimates. The SEs in this model are generally modest, implying reliable coefficient estimates and stable measures of each predictor's impact on credit repayment.

The t-Statistic is obtained by dividing each coefficient by its Standard Error, assessing whether the coefficient significantly differs from zero. For example, the t-value for the Natural Disasters coefficient is -4.38, calculated as -0.35 / 0.08, indicating that the effect is over four times larger than its SE, strongly suggesting a true effect rather than random chance. Typically, t-values exceeding ±2 are considered statistically significant at the 0.05 level, which aligns with the results here.

The p-value indicates the probability of observing such an effect if the true coefficient were zero. All predictors have p-values below 0.005, with most at 0.000, denoting extremely high statistical significance. This means we can reject the null hypothesis that these variables have no effect on credit repayment with high confidence, affirming their importance in the model.

R (Correlation is Coefficient = 0.83). The R-value signifies a strong positive correlation between the combined set of extraneous variables and credit repayment levels. An R of 0.83 suggests that these external factors are closely associated with repayment behavior, capturing much of the variability in the dependent variable.

R-squared is (0.69). The R-squared indicates that approximately 69% of the variation in credit repayment can be explained by the included extraneous factors. This high value signifies a good model fit, implying that these external influences are major determinants of repayment performance among cooperative members.

Adjusted R-squared is (0.67). Adjusted R-squared accounts for the number of predictors relative to the sample size, providing a more accurate measure of explanatory power. At 0.67, it confirms that even after penalizing for complexity, the model explains a substantial portion of the variation, reinforcing its robustness and reliability.

F-Statistic is (34.5, p=0.000). The F-statistic tests whether the overall regression model is statistically significant i.e., whether the combined predictors reliably explain variation in credit repayment. An F-value of 34.5 with a p-value of 0.000 indicates that the model as a whole is

highly significant, and the likelihood that such a strong relationship is due to chance is extremely low.

Collectively, these coefficients reveal that external environmental factors particularly economic stability, political conditions, inflation, natural disasters, and input costs significantly influence members' capacity to repay credit in Nasarawa State. Negative external shocks and rising operational costs diminish repayment levels, while a supportive business environment enhances them. Effective management of macroeconomic stability, disaster preparedness, and operational costs is essential to improve credit repayment performance within the agricultural cooperative sector.

The statistical metrics demonstrate that the regression model is both statistically robust and practically meaningful. The small standard errors and high t-values confirm that individual predictors are reliably estimated and significantly associated with credit repayment. The model's high R, R-squared, and adjusted R-squared values underscore its strong explanatory power, while the highly significant F-statistic confirms that the set of extraneous external factors collectively influence repayment behaviour in a meaningful way. These results provide confidence that external economic, political, environmental, and operational factors are critical in understanding and potentially improving credit repayment performance in Nasarawa State's agricultural cooperatives.

CONCLUSION AND RECOMMENDAION

1. The findings reveal that most cooperative members in Nasarawa State access small to medium-sized loans (averaging around ₦308,000), but face significant repayment challenges, with 50% repaying less than 20% of their borrowed amounts highlighting high default rates influenced by external shocks and limited financial literacy. Despite some farmers managing to repay higher proportions (61–100%), overall repayment performance remains low, underscoring the need for targeted risk mitigation measures, capacity-building, and tailored financial products to improve credit sustainability among smallholder farmers.
2. The regression analysis indicates that socio-economic characteristics significantly influence farmers' credit repayment in Nasarawa State, with factors such as membership in farmers' organizations, farm size, and reliance on family labor showing strong positive effects on repayment likelihood. Conversely, increasing age slightly reduces repayment capacity, suggesting that younger farmers and those actively engaged in social networks and larger farms are more likely to meet their credit obligations.
3. The regression results indicate that organizational characteristics such as strong bonds among members, effective communication, clear structure, and active participation significantly enhance credit repayment among cooperative members in Nasarawa State, with the model explaining approximately 72% of the variation in repayment behavior. These findings highlight the critical role of well-structured, transparent, and participative organizational traits in fostering financial discipline and sustainability within cooperative societies.
4. The regression results highlight that external factors such as economic downturns, political instability, inflation, natural disasters, and rising input and fund costs significantly negatively impact members' credit repayment in Nasarawa State, with worsening economic and environmental conditions reducing repayment levels by substantial margins. Conversely, a favorable business environment positively influences repayment, emphasizing the critical role of macroeconomic stability, disaster resilience, and cost management in enhancing repayment performance; these external factors collectively explain about 69% of the variation in repayment behavior, indicating their strong influence on cooperative members' financial commitments.

In conclusion, the study reveals that while cooperative members in Nasarawa State generally access small to medium-sized loans, their repayment performance remains suboptimal, with half of the borrowers repaying less than 20% of their borrowed amounts. External shocks such as economic downturns, natural disasters, and rising operational costs significantly impede repayment efforts, underscoring the necessity for implementing risk mitigation strategies, financial literacy programs, and tailored financial products that address these vulnerabilities to enhance credit sustainability among smallholder farmers.

Furthermore, socio-economic characteristics play a vital role in influencing repayment behavior. Farmers who are members of organized groups, possess larger farm sizes, and rely on family labor demonstrate higher repayment rates, while increasing age slightly diminishes repayment capacity. These findings suggest that encouraging social cohesion, expanding farm enterprise scales, and fostering active engagement among younger farmers can improve repayment outcomes, contributing to the financial resilience of cooperative members.

Organizational attributes within cooperatives also substantially affect repayment performance. Well-structured, transparent, and participative organizations with strong member bonds and effective communication channels are associated with higher repayment rates, explaining about 72% of the variation in repayment behavior. This highlights the importance of fostering sound organizational governance, promoting active participation, and building trust within cooperatives to strengthen financial discipline and ensure long-term sustainability.

Lastly, external macroeconomic and environmental factors significantly influence members' ability to meet credit obligations, with adverse conditions such as inflation, political instability, and environmental shocks reducing repayment levels markedly. Conversely, a stable and conducive business environment enhances repayment prospects. These external influences account for approximately 69% of the variation in repayment behavior, emphasizing the critical need for macroeconomic stability, disaster preparedness, and cost management policies to support agricultural finance and improve repayment performance in Nasarawa State.

Based on the findings of this study, it is recommendation that:

1. To address the low repayment rates and high default levels, stakeholders should develop and deliver targeted training programs focused on financial literacy, debt management, and risk mitigation strategies. Additionally, introducing tailored financial products such as flexible repayment schedules, crop insurance, and contingency funds can help shield farmers from external shocks and improve their ability to meet loan obligations.
2. Efforts should be made to enhance the organizational capacity of cooperatives by fostering transparent governance, effective communication, and active member participation. Encouraging the formation and strengthening of social networks among farmers, particularly targeting younger farmers and those with larger farms, can boost collective accountability and improve repayment performance.
3. Policymakers and development agencies should facilitate training and capacity-building initiatives aimed at improving the organizational structures of cooperatives. Emphasizing the importance of strong member bonds, clear operational procedures, and participative decision-making can foster a culture of financial discipline and sustainability, which in turn enhances credit repayment rates.
4. To mitigate the adverse effects of external shocks, it is essential to promote macroeconomic policies that ensure stability, such as inflation control and political stability. Additionally, investing in disaster resilience measures, climate-smart agriculture, and cost management practices will help safeguard farmers' income streams and improve their capacity to repay loans, even amid external uncertainties.

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