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DETERMINANTS OF CREDIT CONSTRAINT AMONG SMALLHOLDER FARMERS' CO-OPERATORS IN OYO STATE, NIGERIA

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Abstract: Credit constraint (CC) has been identified as one of the factors that diminish the production efficiency of farmers. Although Multipurpose Cooperative Societies (MCS) have been identified as an avenue to reduce (CC) among farmers, (CC) persists. Thus, the effectiveness of (MCS) in credit delivery and the determinant of (CC) of co-operators were examined. A four-stage sampling procedure was used where Oyo State was purposively selected based on high numbers of registered Agricultural Cooperative Societies. One block was selected from each zone of the four Agricultural Development Project zones. Two cells were randomly selected from each block. Multi-purpose cooperative societies from each of the cells were randomly selected. Co-operators were randomly selected proportionate to size and in all, 200 respondents were randomly selected. Co-operators access credit, inputs, tractors, market information and processed their produce by (MCS). Female co-operators were more credit constraint than their male counterparts. Education, default history farming experience, monthly contributions and dependency ratio were the determinants of credit constraint. Default history has the highest impact in determining credit constraint of co-operators, therefore conscious effort is needed by co-operators to avoid it occurrence. Credits should be made available to farmers through cooperative societies to enhance their efficiency.

Keywords: Credit access, Farmers' groups, Tobit regression

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1. Introduction

A cooperative society is conceptualized as "an autonomous association or group of people voluntarily united to meet their economic, social needs and aspiration through a jointly owned and democratically controlled enterprise (Okem, 2016; Nwankwo, 2008 as cited in Nwafor et al, 2018). Researchers believe that cooperatives play a significant role in the provision of services that enhance production efficiency and agricultural development. Kidane et al. (2018); Nwafor et al. (2018), described cooperatives as a channel through which services like inputs, implements, machines, agricultural credits, agricultural extension, members' education, and marketing of farm produce among others are supplied. Regular and optimal performance of these roles accelerate the development of agriculture as well as rural economic growth and development (FAO, 2011; Nwafor et al., 2018).

Credit is vital to increasing farmers' yield and profit. Access to credit, labour availability and other complimentary inputs are drivers for the use of modern inputs in agriculture (Komolafe and Adeoti, 2018). However, the larger part of the world lives in poverty, lacking access to credit (Dube et al, 2015; Ijioma and Osondu, 2015). Credit smoothing consumption by providing needed capital for output enhancement and reduces household poverty (Mukasa, et al., 2017). There is a growing demand for farm credit above the farmer's personal savings (equity) obtained from their low farm income which gives rise to the popular vicious cycle. According to (Von Pischke and Adam, 1980; Ijioma et al., 2015) lack of or inadequate access to credit by poor rural farming households has a negative consequence on agriculture productivity, income generation and household welfare (Diagne and Zeller 2001; Dube et al., 2015). When social capital from cooperative society is included, it facilitates access to credit, lower transaction cost and improve welfare (Bernard et al., 2012; Komolafe et al., 2018). It is often argued that the formal and informal financial sector in developing countries including Nigeria failed to serve adequately the poorer section of the communities that are majorly rural household farmers. Collateral, credit rationing, preference for high-income clients and large loans,

bureaucratic and lengthy procedures of providing loan in the formal sector kept poor people and rural households outside the boundary of the formal sector financial institution in developing countries (Anyanwu, 2004; Chandio, et al., 2017). Previous studies have shown that cooperative societies carry out the function of credit delivery to farmers, but there is still ample evidence that farmers face difficulties in obtaining credit and the problem of sourcing capital still lingers. The question therefore is whether these cooperatives are effective or not in credit delivery to affect the output of farmers.

In agriculture, credit constraint depicts a gap between the demand and supply of credit. A wide gap indicates a greater level of credit constraint according to Nagarajan, et al. (1998); Omonona, et al. (2010), defined credit constraints as the situation whereby a household cannot avail itself of the credit it desires at the prevailing market conditions. In rural communities of developing countries, credit constraint adversely impacted farmers' output (Feder et al., 1990; Petrick, 2004; Omonona et al., 2010), farm profit (Foltz, 2004; Omonona et al., 2010) and farm investment (Carter and Olinto, 2003; Omonona et al., 2010). Guirkinger and Boucher (2008) identified two additional credit constraint situations that affect households in terms of access to the credit market and their resource allocation aside from quantity constraint identified by (Nagarajan et al., 1998; Hussein and Ohlmer 2008; Omonona et al., 2010).

Nigerian farmers are usually made up of smallholder farmers that cannot provide the needed capital for agricultural modernization and efficient productivity because of their high level of poverty, consequently, the financial institutions ultimately become the last restore (Orebiyi, 2002; Kay et al., 2012). To enhance their efficiency, farmers must have access to the needed funds in executing farm enterprise plans. Unfortunately, the majority of farmers in Nigeria cannot generate enough financial resources from their farming operation (equity financing) and they are therefore compelled to source funds from other sources to execute their enterprises (Kay et al., 2012).

Thus, the prime targeted group of agricultural credit was composed of a vast number of scattered smallholder farmers, hence, credit needed to be administered in small doses. These characteristics accounted for the scanty involvement of banks in agricultural lending, therefore, very few farmers can access institutional credit (Nwafor, et al., 2018). Uncertainty in the agrarian credit markets is due to incomplete information that enhances adverse selection and moral hazard scenarios (Stiglitz and Weiss, 1981) cited in (Mukasa, et al, 2017). Nwafor et al. (2018) identified some factors affecting the farmers' credit repayment ability as production inefficiency, defective management, and shortage of skilled manpower, insufficient loan, and delay in the supplies of input, inadequate storage, credit accessibility bureaucracy, corrupt staff and high-interest rate among others. This leads to credit rationing and credit constraint. Research on the use of credit implied that although it is not obvious that demand for credit outweighs the supply, there are significant obstacles in the transformation of potential demand to effective supply (Hussain and Thapa, 2012) as cited in Chandio et al. (2020). Research has shown that in rural areas of developing countries, credit constraints impact farm output (Petrick, 2004), farm profit (Foltz, 2004) and farm investment (Carter et al., 2003) adversely. Awotide et al. (2015) identified quality rationing and risk rationing as causes of credit constraint that adversely impact farm resource allocation and productivity. Due to difficulties farmers face in accessing credit, many of them belong to social groups majorly cooperative societies from where they were able to access credits. Studies on determinants of credit constraints among cooperative societies are limited, consequently, this paper examined the determinants of credit constraint among smallholder farmers' co-operators in Oyo State

1.1. Objectives of the Study

The general objective of this study is to examine the factors that determine the level of credit access among farmers that are members of the multipurpose cooperative society in Oyo State.

The specific objectives are:

1. Identify the benefit derived by co-operators.
2. Estimate the volume of credit requested for and obtained by male and female co-operators.
3. Estimate the factors that determine the level of credit constraint among smallholder farmers' cooperators.

2. Materials and Methods

2.1. Study Area

This study was carried out in Oyo State, one of the 36 states in Nigeria. The State has 33 Local Government Areas and four ADP zones. The rural populace in the State grows majorly arable food crops while very few rear livestock. As a result of their engagement in agricultural activities, cooperative activities in the state are high (Enhancing Financial Innovation and Access Enhancing Financial Innovation and Access (EFInA, 2012). Agriculture forms the predominant occupation of the populace alongside other vocations like trading, crafts, and agro-processing among others.

2.2. Sources and Types of Data

This study relied largely on primary data collected using structured questionnaires administered personally and with the help of cooperative field officers and extension agents. Secondary data was also collected from the book of cooperative societies. The list of all registered multi-purpose cooperative societies was obtained from the Ministry of Commerce and Industry from which the multi-purpose cooperative societies for this study were purposively selected.

2.3. Sampling Procedure

This study adopted the State Agricultural Development Project (ADP) sampling frame. A multi-stage sampling

procedure was used for this study. The first stage is the purposive selection of Oyo State in Southwestern Nigeria because the State has a high number of registered agricultural cooperative society cooperative activities (EFInA, 2012) and Ibadan was the former headquarter of Cooperative Federation Limited in Nigeria (Effiomi, 2014). The second stage was the random selection of one block each from the four ADP zones. Two cells were then selected randomly from each block and the third stage involves the random selection of multi-purpose cooperative societies from each of the last stages was a random selection of co-operators. The number of co-operators selected from each village was proportionate to the size of the registered cooperative members in all, 200 respondents were randomly selected proportionate to the size of the cell (Table 1).

Table 1. Sampling procedure for selection of co-operators

ADP zone/estimated household	ADP Blocks	No of questionnaire administered and analyzed
Ibadan/Ibarapa (113,368)	Eruwa	16
	Bamigbose	9
		Total = 25
Ogbomoso (90,413)	Aba Oyo	12
	Alawusha	12
		Total = 24
Oyo (91,9340)	AbuleOdo	14
	Aba Titun	12
		Total = 26
Saki (119,315)	Ago Amodu	14
	Adaku	11
		Total = 25

2.3. Analytical Techniques

The study employed a number of analytical tools including descriptive statistics, frequency distribution, mean, standard deviation percentages tables and bar chart. Tobit regression was used to estimate the factors that determine the level of credit constraint.

Credit constraint level (Tobit regression) (Equation 1)

$$C = f(X_1, X_2, X_3, X_4, X_5) \quad (1)$$

C = Credit constraint level
X_1 = Age of co-operator (years)
X_2 = sex (Dummy, Male = 1, Female = 0)
X_3 = Years of education of co-operators (years)
X_4 =Default history (Dummy, Default history = 1, non-default history = 0)
X_5= Primary occupation
X_6= Farming experience
X_7= Duration of membership 0f cooperative (years)
X_8 = Area cultivated
X_9 = Naira value of inputs through cooperative society
X_{10} = monthly cash contribution to cooperative society
X_{11} = Distance to credit (meeting)
X_{12} = Land ownership (Hire land=0, Ownership of land=1)
X_{13}= Dependency ratio

3. Results and Discussion

3.1. Socio-Economic Characteristics of Co-Operator Farmers

The distribution of respondents based on selected socioeconomic characteristics was given in Table 2.

The results above revealed that most respondent co-operators (74%) were male. At the time of the survey, the average age of farmer co-operators was 45 years. The average year of formal education was 8.3 years (the implication is that it will affect their attitude towards adoption of scientific techniques, money management and reduces their credit constraint) this is in variance with the descriptions of the Nigerian rural sector given by Adeoti (2014) that there is low level of education of the Nigerian rural sector, while 46% of the respondents had secondary school education. Most co-operators joined their group through information from friends and relatives (60%) this corroborates Thompson et al. (2017) only (21%) received information to join the group through extension agents. While 19% were foundation members. Most cooperative societies held meeting once a month (80%) and their average monthly contributions were ₦881.27 this value is higher than that of Komolafe and Adeoti (2018); the maximum contribution was ₦5000.00, and the minimum contribution was ₦200.00. Fifteen percent of the respondents received loans from friends and relatives, 16% got credit from buyers of output 0.9% obtained credit from private money lenders, 0.6% obtain credit from Nigerian Agricultural, 9% obtained credit from microfinance while a greater percentage (45%) used personal savings. The various uses of credit obtained were shown in Table 3. 83% of co-operators used their credit solely to expand their farming business while 11% of the total co-operators used credit for non-farming business and 6% of co-operators used their credit for consumption and welfare of the household.

Table 2. Distribution of respondents based on selected socioeconomic characteristics

Variables	Frequency (%)	Mean	Std. Deviation	Maximum	Minimum
Age(years)					
≤ 30	14 (7)				
31-40	45 (22.5)	45.22	8.9	61.0	21.0
41-50	87 (43.5)				
51- 60	49 (24.5)				
>60	5(2.5)				
Education(years)					
1-6	21(42)				
7-12	46 (92)	8.3	2.6	15	4
13-17	33(66)				
Household size					
1-4	60 (30.0)				
5-8	102 (51.0)				
9-12	38 (19.0)				
Sex		6.1	2.49	12	2.00
Male	148(74.0)				
Female	52(26.0)				
Marital status					
Single	162 (810)				
Married	32(17.0)				
Widow(er)	6 (3.0)				
Extension Contact					
Contact	154 (77.0)				
No contact	66 (33.0)				
Information to Join Cooperative					
Foundation members	38(19.0)				
Friends and relatives	132(66.0)				
Extension agents.	427(21.0)				
Meeting time					
Once monthly	160 (80)				
Twice monthly	40 (20)				
Monthly contributions					
0-500	46 (23.0)	N881.27	881.266	5000	200
501-1000	104 (52.0)				
1001-1500	26 (13.0)				
1501-2000	20(10.0)				
>2000	4 (2.0)				
Years of membership of cooperative					
1-5	112 (56.0)				
6-10	50 (25.0)				
11-15	38 (19.0)				
Use of credit obtained					
Farming	166(83.0)				
Non-farming	22(11.0)				
Consumption	12(6.0)				

Table 3. Volume of loan requested for and obtained by co-operators

Volume of loan requested and obtained (₦)	Total co-operators frequency	% of total co-operators	% of total co-operators	% of male co-operators	% of male co-operators	% female co-operators	% of female co-operators
	Requested	Requested	Obtained	Request	Obtained	Requested	Obtained
0-50,000	06	03	02	03	02		
51,000 -100,000	72	36	22	22	16	14	06
101,000 -150,000	44	22	19	12	11	10	08
151,000 -200,000	32	16	11.5	11	09.5	05	02
201,000 -250,000	08	04	04	03	02	01	02
251,000 -300,000	04	02	04	01	02	01	02
301,000 -350,000	10	05		03		02	
351,000 -400,000	08	04		02		02	
401,000 -450,000	04	02	02	02	01		01
451,000 -500,000	04	02	02	02	01		01
>500,000	02	01	0.5	01	0.5		
Total	194	97.0%	67.0%	62.0%	45.0%	35.0%	22.0%

Table 4. Co-operator farmers' classification based on their types of credit constraint conditions

Constrained co-operator	Frequency (%)	Unconstrained co-operator	Frequency (%)
Quantity constrained	60 (30.0)	Borrowers	47 (23.5)
Risk constrained	20 (10.0)	Non borrowers	6 (3.0)
Transaction cost constrained	67 (33.5)		
Total	146 (73)		53 (26.5)

3.2. Volume of Loan Requested for and Obtained by Co-Operators

Showed that the majority (97.0%) of the co-operators put forward their request for a loan, (this is an implication that farmers are in dire need of funds for their faring enterprises), but only (67.0%) of the total co-operators were granted loans (it means that cooperative societies are short of fund required to be granted as loans there makes farmers to be credit constraint. Sixty-two percent of the loan applications put forward were submitted by male co-operators (it implies that men's involvement in social groups and farming enterprises is greater than that of women) this supports the work of Orisadare (2019) while only 35.0% were forwarded by female co-operators. Out of (67.0%) approved and disbursed (45.0%) of the disbursement were to men while (22.0%) were disbursed to women. Seventeen percent of the men's applications were not granted, while only (13.0) % of the women's applications were rejected, the total number of rejected applications was (30.0%). The loan amount requested ranges from as low as <50,000 to as high as >500,000. The majority (36.0) of the co-operators requested 51,000 -100,000 and 22.0% of these requests were made by men, out of which only 16% was granted, while only 14%of the request came from women and 06% was granted. Only 1% of the co-operators requested loans greater than 500,000, and despite the fewer request made only 0.5% was approved and disbursed.

3.3. Co-Operator Farmers' Classification Based on Their Types of Credit Constraint

According to Guirkinger and Boucher (2008) 'rejected applications or non-applicants that needed the fund were quantity constraint (30.0%) this agree with the work of Haichao Edwin Amber (2015) that quantity constraint impact business negatively, those that had enough fund or asserted that the interest rate is too high and have no profitable investment were classified as price unconstraint, but those that considered the transaction cost to be high, but needed the credit were cost constraint (33.5%), while those that entertained fear of loose were risk constraint (10.0%)'. Non-constraint borrowers were (23.5%) and non-constraint co-operators that had enough for their far operation were only (3.0%)

3.4. Other Benefits from Cooperative Society

Figure 1 showed that only 69% of the total respondents had access to inputs through cooperative society, while 3% of co-operators had access to tractors that were either hired or owned by cooperative society. Also, 24% of co-operators had access to market information through the cooperative society and while 4% had their produce processed by the cooperative society.

Figure 2 showed the problems faced by cooperative society. The main problem faced by cooperative society was funding to meet the high demand for loans by co-operators (60.0%). Other problems are managerial problems (25.0%), and low contribution from members (57.0%). Non–prompt repayment of loans (36.0%), low government intervention in the form of subsidy (56.0), inability to purchase machinery (15.0%), lack of commitment by members (07.0%) and low growth rate (15.0%)

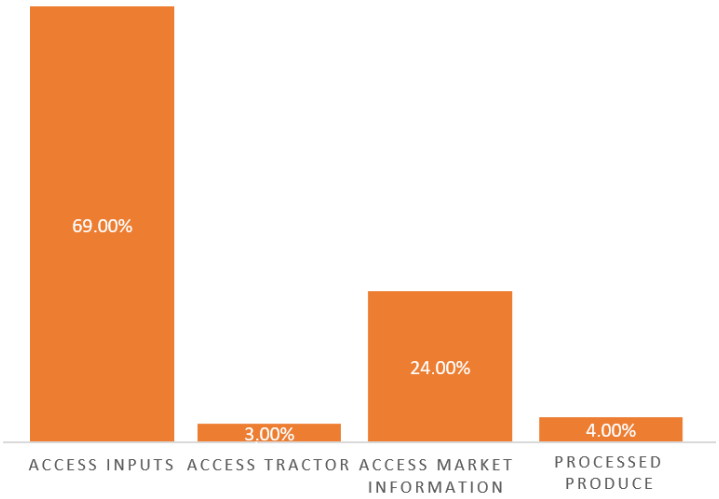

Figure 1. Other benefits from cooperative society.

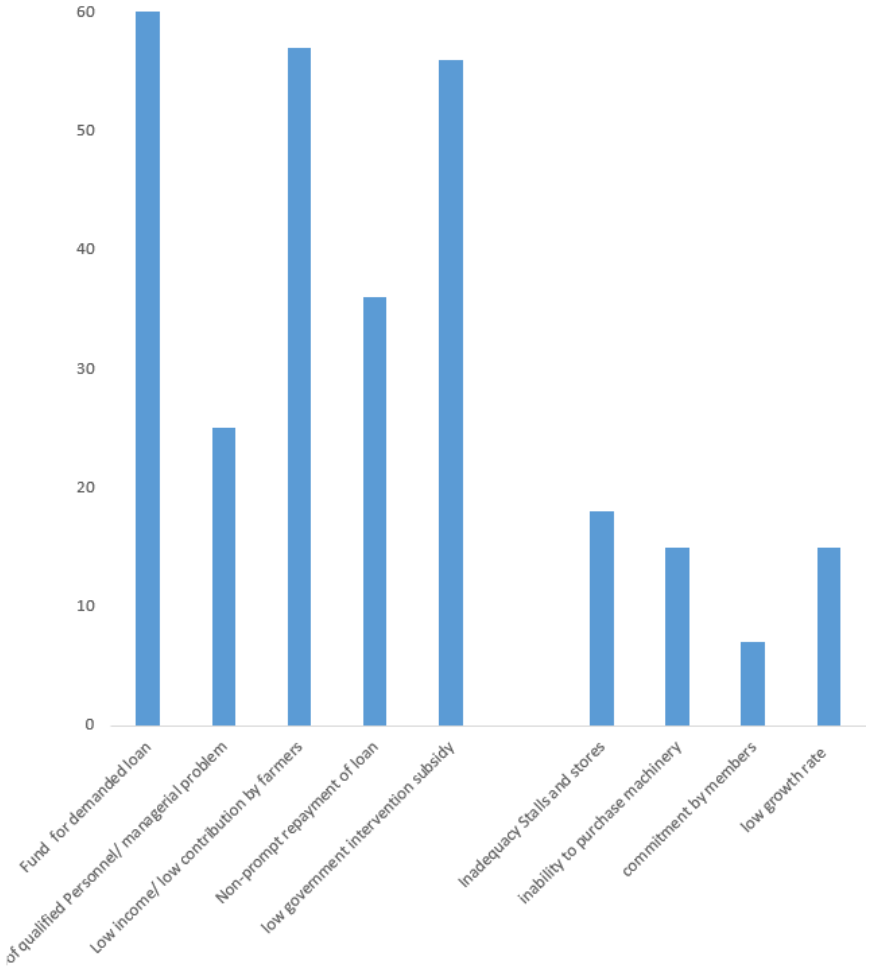

Figure 2. Problems faced by the cooperative society.

3.5. Estimated Determinants of Credit Access Constraint among Co-Operator Farmers

Tobit regression model was employed in identifying factors influencing the credit access of co-operator Farmers. Out of thirteen explanatory variables included in the model, only six were significant. The significant explanatory variables were the sex (P<0.05) of co-operator farmers, education (P<0.10), default history (P<0.001), farming experience (P<0.10), monthly contributions (P<0.10) and dependency ratio (P<0.10). The marginal effects were an indication of a one-unit change in an exogenous variable on the probability that a co-operator farmer was credit constrained. The sex of the co-operator was statistically significant at 5% with a negative coefficient of -6.39. This implies that females are associated with higher levels of credit constraints

compared to male counterparts, this agrees with the findings of (Omonona et al., 2010; Wellalage and Thrikawala, 2021; Zhang et al., 2022). Another significant variable is the default history of the co-operator; it was significant at 1% with a positive coefficient of 13.72. This means that a single record of default or delay in loan payment increases levels of credit constraints of co-operators by over a hundred percent (137%). This agrees with Pishbahar et al. (2015) findings that asserted that receiving another service from the banks is positively correlated with repayment.

Education was found to be statistically significant at 10% with a negative value of coefficient -0.39, it means a 1 percent increase in the year of education decreases the probability of the co-operator being constrained by 3.9 percent; this agrees with the findings of (Omonona et al., 2010).

The farming experience was significant at 0.1 percent with a negative coefficient of -0.3 indicating that a 1-unit increase in years of farming experience will bring about a 30% reduction in the probability that a co-operator will be a credit constraint. The monthly contribution of co-operators was significant at 10 percent and the coefficient is -0.002. It implies that a 1-naira increase in monthly money contributed by co-operators will lead to a reduction in the probability of co-operators being credit constrained by 0.2 percent. This corroborate the finding of Okonkwo – Emegha et al. (2018) that credit worthiness of farmer Cooperators was determined by their regular contribution of thrift savings. The dependency ratio is also statistically significant at 10% and the coefficient is 0.78. This indicates that with a 1-unit increase in dependency ratio, the credit constraint of co-operators will probably increase by 78% this agrees with (Omonona et al., 2010). This might be because the dependency ratio increases the co-operator per capital expenditure and therefore reduces the amount of money that can invest in agriculture. In addition, farmers may divert the funds collected from associations to consumption.

Table 5. Tobit regression: determinants of credit constraint level among co-operator farmers

Constraint variables	Estimated Coefficient	P>|t|
Age	-0.03	0.70
Sex	6.39**	0.004
Years of education	-0.39*	0.07
Default history	13.72***	0.000
Primary occupation	0.15	0.95
Farming experience	-3.05*	0.02
Duration of membership	-0.25	0.52
Area cultivated	0.29	0.80
Input value from cooperative	0.00001	0.90
Monthly contributions	-0.002*	0.03
Distance to credit(meeting)	-0.26	0.32
Land ownership	1.78	0.45
Dependency ratio	0.78*	0.03
Constant	3.34	0.86

Significant level =*** (P<0.01) ** (P<0.05) * (P<0.10), Number of obs= 194, Log likelihood function= -531.08206, Restricted log likelihood= -651.67458, Chi- squared= 0.0000, Significant at *** (P<0.01) ** (P<0.05) * (P<0.10).

4. Conclusion

Co-operators derived other benefits from their society apart from accessing credit. Other benefits derived were accessing inputs, tractors, market information and processing of produce. Female co-operators were more credit constraint than their male counterparts. Other determinants of credit constraint were education, farming experience, default history, monthly contributions and dependency ratio. All these variables reduced the credit constraints of co-operators. The determinants of the production efficiency of farmers were labour, area of land cultivated, fertilizer and the quantity of seed used.

Based on the finding of this study and the conclusion drawn some policy implications and recommendations were made towards improving cooperative societies in agricultural financing: The most substantive are;

- Gender disparity in credit accessibility should be discouraged by the Cooperative department in the Ministry of Commerce.
- Officials of cooperatives should be trained periodically in the management of cooperative society, while their members should be educated on the proper use of credits to avoid default in repayment of loans and consequently leading to exposure of co-operators to credit constraint
- Saving should be encouraged among members and debt recovery tactics should be fortified in the area of study.
- Extension agents should be adequately fortified by the government so that farming skill and new technology is adequately taught to the farmer, especially those with little or no experience in farming.

Author Contributions

The percentage of the author(s) contributions is presented below. All authors reviewed and approved the final version of the manuscript.

	O.K.	A.O.	D.O.I.	I.S.O.
C	25	25	25	25
D	25	25	25	25
S	25	25	25	25
DCP	25	25	25	25
DAI	25	25	25	25
L	25	25	25	25
W	25	25	25	25
CR	25	25	25	25
SR	25	25	25	25
PM	25	25	25	25
FA	25	25	25	25

C=Concept, D= design, S= supervision, DCP= data collection and/or processing, DAI= data analysis and/or interpretation, L= literature search, W= writing, CR= critical review, SR= submission and revision, PM= project management, FA= funding acquisition.

Conflict of Interest

The authors declared that there is no conflict of interest.

Ethical Consideration

Ethics committee approval was not required for this study because of there was no study on animals or humans.

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