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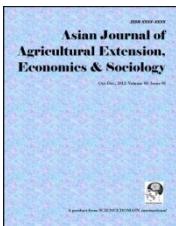
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Default Risk and Determinants of Farmers' Access to Micro-credit from Cooperative Societies in Abia State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author COE designed the study; produced data gathering instrument, coordinated data collection and collation and wrote the first draft, edited and corrected the peer reviewed manuscript(s). Authors ANN, CKO and NJ collected the data from respondents over the years (2011 and 2012) and read through the edited draft. Authors COA and GMCI handled the statistical analysis and literature search as well as read through the edited draft. Author COA is handling all correspondence for this publication. All authors read and approved the final manuscript.

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ABSTRACT

This study on default risk and determinants of farmers' access to micro-credit from cooperative societies was carried out in Abia state, Nigeria. Longitudinal data on micro-credit seeking and repayments for ninety (90) rural farm households in three agricultural zones of the state were collected for 2011 and 2012 farming seasons. The cooperatives and farm households were chosen following stratified random sampling technique. Data gathered through a survey were analyzed descriptively and by inferential statistics using probit regression technique. Results indicated 57 of the 90 farm households involved in this study received a total of N2, 947,140.00 from their cooperative societies and repaid N2, 210,230.00 within a required 24 months. The overall repayment performance of 74.99% was thus very good compared to the 25.01% default rate. The number of years of

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farming, taking farming as major occupation, years of farmers' membership to cooperative society and farmer's deposit/savings in the cooperative society were factors that positively and very significantly ($P=0.01$) influenced access to loans in the cooperative societies. Another factor that positively but moderately ($P=0.5$) influenced access to cooperative loans was members demanding for credit after being denied loan(s) from formal sources (spillover demand). The only negatively significant factor that moderately influenced access to cooperative loans was default in repaying previous credit. These factors emphasized that devout commitment to ideals of cooperative movement assures members access to available loans in cooperative societies. Cooperators who benefit from union loans should learn to repay within reasonable agreed period of use of the loan to avoid being in default of repayment and guarantee getting new loans on future requests. They should invest loans in quick yielding enterprises and engage in viable off-farm jobs to earn extra incomes that enhance their cash flows.

Keywords: Default risks; semi-formal credit; registered cooperative societies; deposits.

1. INTRODUCTION

Farming in rural Nigeria has widely changed from being activity aimed at providing food and fiber for household subsistence to one providing for the market (commercial farming). Like every competitive commercial engagement, farmers are not able to adequately finance their operations alone with personal savings and therefore have relied much on funds borrowed from different sources at some varying degrees of accessibility. Access to credit has been recognized as one major determinant of economic growth [1]. Agriculture is considered by fund lending institutions as occupation with great risks, on account of vulnerability of its enterprises to failures with low coverage of dependable formal insurance policy, especially at level of small scale operation. This has accounted for denial of access to credit to small-holder farmers by commercial banks in Nigeria (K. Mbubaegbu, Abia State University, Uturu, Nigeria Unpublished B. Agric. Degree Project).

There are however many credit sources open to farmers to meet their needs for funds as they shop for credit from formal and informal credit displays and from some semi-formal sources made possible by beneficiaries themselves and/or concerned stakeholders. Formal credit is provided by Governments, corporate finance establishments—commercial banks, development bank (Bank of Agriculture) and microfinance banks. The informal credits are provided by money lenders, farmers groups, non-registered farmers cooperative societies, Rotating Savings and Credit Association (RoSCA), product traders, farm input suppliers and relations of the farmers (O. Adebajo, The Hague, Netherland Graduate School for Arts and Development Studies, Unpublished MSc Thesis). The semi-formal sources of farm credit in Nigeria are essentially registered cooperative societies and Microfinance Institutions owned by Non-Governmental Organizations (NGO-MFIs) [2,3]. Semi-formal credit sources offer relatively lower interest charges and accept flexible collaterals with loans targeted to selected areas and selected type of farmers (who have no access to formal loans) (C. Guirkinger, The University of California Davis, report of research with fellowship of International Dissertation Field Research program—Social Science Research Council). Lenders have to decide which loan applicants to favour after considering some factors including cost of the credit and risk associated with the applicants since chance remains unceasingly at work within the credit markets. In like manner, farmers have to decide which sources to approach for loans after considering some conditions attached to the available loans.

Risks in this case are those potential losses incurable by action of entering into credit transactions (likelihood), the probability of occurrence of which can be estimated [4,5]. These risks among others include loan repayment default, information asymmetry, decline in farm yield, product price instability and high interest charges on loans [6,7,8,9,10,11]. Loan repayment defaults or default risk in loans from cooperative society therefore are those possibility that a beneficiary of cooperative loan is unable to meet interest and/or principal repayment obligations on a loan agreement (A. Abel and JC. Eberly, Abel Northwestern University, Mimeo). Incidences of default on repayments of formal loans have been reported in Nigeria [12,13,14].

Small-scale farmers in Nigeria have complained of denied access to loans from commercial banks on account of their inability to provide necessary collaterals demanded by the banks (K. Mbubaegbu, Abia State University, Uturu, Nigeria Unpublished B. Agric. Degree Project, [15]. Formal credit institutions on their part have indicted small scale farm borrowers as customers on whom they incur high transaction costs with poor repayment of borrowed funds [16,17]. To help strengthen farming operations with external funds, farmers have on their part embraced calls to form cooperative societies and pool their deposits/savings for lending to needy members [18]. Some cooperative societies are not registered and are likened to farmers groups or informal lenders. Registration of cooperative societies gives them quasi formal status and permits them to run businesses without hindrances. Registered cooperative societies lend money to their members based on members deposits (their savings), peer collaterals and some other factors that benefit such members [18,2]. In spite of these inbuilt assurances there are evidences of default risk or credit default with borrowing members of registered cooperative societies [19]. Cooperative societies have rules which govern their operations as institutions including giving out their deposits or on-lending facilities as loans to their members or others.

To what extent the observed defaults in loan repayments have hindered access to new loans in cooperative societies have truly not been widely investigated in Nigeria. This study therefore had its specific objectives to: (i) describe household socioeconomic characteristic of beneficiaries of farm micro-credit from registered cooperative societies in rural Abia State; (ii) assess credit default exhibited by rural farmer beneficiaries of micro-credit from registered cooperative societies in the study area; and (iii) determine factors that influenced farmers' access to credit from registered cooperative societies in the state.

2. METHODOLOGY

2.1 Study Area

This study was conducted in Abia State, Nigeria. This state is one of the south-eastern states of Nigeria lying between longitudes 04° 45' and 06° 17' East of the Greenwich Meridian and latitudes 07° 00' and 08° 10' North of the Equator. It is occupying an area of 5,833.7 Km² (Abia State Government, Economic and Development Strategy Document). Abia state is located 596 Km away from Lagos and 498 Km away from Abuja, the Federal Capital Territory (Abia State Government, Economic and Development Strategy Document). The state with its administrative headquarters at Umuahia has a population of 2,833,999 consisting of 1,434,193 males and 1,399,806 females (Federal Republic of Nigeria, Official Gazette on 2006 census breakdown by states and local governments), and is made up of seventeen (17) local Government Areas (LGAs), with three Agricultural zones. The Agricultural zones are Aba, Umuahia, and Ohafia that are inhabited by about 315,910 farm

households (Abia State Agricultural Development Programme, Document). Abia State is notable for production of tree crops like oil palm, cocoa, cashew, and rubber. Livestock farming in the state produce poultry, pigs, goats, sheep and rabbits. Food crops grown in the state are cassava, yam, rice, plantain, banana, cowpeas, vegetables, melon, pineapples and maize. The commonest farming system in Abia State agricultural zones is mixed farming (growing crops and rearing livestock jointly) with most farmers operating on scales that classify them as smallholders. These farmers facilitate their operations by belonging to one cooperative society or another (Abia State Agricultural Development Programme, Document).

2.2 Sampling Technique

Ninety (90) rural farm households who belonged to registered cooperative societies were selected using stratified random sampling techniques on 356 registered rural cooperative societies, chosen from the three agricultural zones of the state. The chosen cooperative societies are Multipurpose Cooperative Society (MPCS) Umuasua and Ugwu Nkpa MPCS from Ohafia agricultural zone; Ulonna South Micro Irrigation MPCS Limited Afugiri and Oganihi Cassava MPCS Itu Olokoro from Umuahia agricultural zone; Solace Farmers MPCS Mgboko Umete and Progressive Farmers MPCS Umuara Isiala Okpu from Aba zone. The selected cooperative societies were chosen by stratified random process (where we assigned the same size to small [membership less than 15 persons], medium [membership between 15 and 20 persons] and large [membership greater than 20 persons] on registered MPCS and Cooperative thrift and credit societies in the agricultural zones). The chosen cooperative societies formed clusters from which thirty (30) member farm households were randomly chosen from each of Aba, Umuahia, and Ohafia agricultural zones of the State. A member farm household was defined for this study in line with [20] as an economic unit consisting of either a single person or a group of persons who live together and depend on common income and within the limits of that income, exercise choices in meeting specific objectives with at least one member describing their major occupation as farming.

2.3 Data Collection

Longitudinal data were collected for two consecutive farming years (2011 and 2012) from the farmers using the same questionnaire administered by personal interview method. Three enumerators were involved in this exercise, and they collected data simultaneously from cooperative member farm households across the agricultural zones of the state. Information on length of time households had been members of cooperative societies, gender of head of household, household farming experience, household size, farm size, deposits with cooperative society, amount of credit sought from cooperative society, amount of loan received from cooperative society and amount of previously received loan that was in default. Other data gathered with the questionnaire included interest charged on sourced micro loan, amount of borrowed funds repaid, duration (term) of the loan, whether refused credit by formal source and major occupation of the member household.

2.4 Data Analytical Techniques

A combination of descriptive and inferential statistical tools was used in analyzing data collected for this study. Frequency distribution, percentages and means were used to describe socio-demographic characteristic of the farm households and specific characteristic of cooperative societies. Factors that influenced farmers' access to micro farm loans from

cooperative societies were determined with a limited response dependent variable model-the maximum likelihood multiple regression probit model. This model of limited dependent variable was as introduced by [21] and applied by [22] and corrected for bias [23] in selection of respondents. The model as observed by [24] and suggested by [25] has ability to generate bounded probability estimates for each observation and assumes that the underlying error term follows a normal distribution as is the case with continuous variables. This probit model was stated as follows:

$$Y_{ij} = \alpha_i + \beta_j \sum_{k=1}^s H_{jks} + \varepsilon_{ij} \quad (1)$$

Where the H_{jks} are vectors of s independent variables of the j th household seeking and using services of funds borrowed from registered cooperative societies for their farm investment. The explained variable Y_{ij} is a vector of binary observations such that $Y_{ij} = 1$ if the j th household had access to micro credit, and 0 otherwise. Since Y_{ij} can only assume two different values: 1 for accessing micro credit; 0 otherwise.

The expected probability was defined as follows:

$$E(Y_{ij}) = E[\alpha_i + \beta_j \sum_{k=1}^s H_{jks} + \varepsilon_{ij}] = \alpha_i + \beta_j \sum_{k=1}^s H_{ij} E(H_{ij}) \quad (2)$$

Equation (2) defined the household's and cooperative's characteristics (H_{ij}) likely to influence getting access to micro loans from the cooperative societies for farm investment. The empirical model was specified for access to rural cooperative society's micro loan for farmers as follows:

$$\begin{aligned} EXP_{ij} = & \beta_0 + \beta_1 \ln(FS_{ij}) + \beta_2 \ln(EX_{ij}) + \beta_3 \ln(OC_{ij}) + \beta_4 \ln(CD_{ij}) + \beta_5 \ln(RC_{ij}) \\ & + \beta_6 \ln(HS_{ij}) + \beta_7 \ln(YM_{ij}) + \beta_8 \ln(GD_{ij}) + \beta_9 \ln(NE_{ij}) + \beta_{10} \ln(PD_{ij}) \\ & + \beta_{11} \ln(IC_{ij}) + \beta_{12} \ln(SV_{ij}) + \varepsilon_{ij} \end{aligned} \quad (3)$$

The independent variables (continuous, discrete and binary) are as defined in Table 1. The dependent variable for equation (3) was household's chance of getting access to micro loan from registered cooperative society as defined in equation (1).

Table 1. Description of variables analyzed by probit regression model

Variable	Variable type	Expected sign eqn. 3	Description of variable
EXPij	Binary		1 if jth household got access to loan from Cooperative society for farm investment; 0 if otherwise Eqn. (3);
FS ij	Binary	+	1 if size of farmland was at most 3.0 hectares or number of livestock was at most 50 heads; 0 if otherwise;
EXij	Continuous	-	Number of years in farming;
OCij	Binary	+	1 if household major occupation was farming; 0 if otherwise;
CDij	Continuous	-	Amount of credit sought for farm investment in Naira;
<u>RCij</u>	Binary	-/+	1 if refused credit by formal source (spillover farmer); 0 if otherwise;
HSij	Discrete	+	Household size (a single person or a group of persons living together and depending on common income and within limits of that income, exercise choices in meeting specific objectives);
YMij	Continuous	+/-	Number of years in membership of cooperative (years);
GDij	Binary	+/-	1 if male; 0 if otherwise;
NEij	Binary	+	1 if an old member of Cooperative Society; 0 if otherwise;
PDij	Continuous	-	Amount of previous credit from Cooperative in default (Naira);
ICij	Continuous	-/+	Interest charged by cooperative society on borrowed fund in Naira;
SVij	Continuous	+	Amount Household deposits/Savings in Cooperative Naira.

3. RESULTS AND DISCUSSION

3.1 General Characteristics

The characteristics of ninety (90) cooperative farm households in Abia state of Nigeria sampled for this study are summarized in Table 2.

Table 2. revealed that farm sizes for a good proportion of the farm households (40.0%) was less than one hectare (mean 0.84ha) with only a small proportion (16.7%) cultivating more than three hectares (mean 5.26 ha). Amongst the cooperative farmers member households, a relatively large proportion (43.3%) cultivated between 1.0 ha and 3.0 ha of farmland with a mean of 2.72ha. These distributions confirm that the farmers in the cooperative societies in the study area were by scale of operation small-scale operators. [26] Revealed that small sizes of farms amongst farmers in southeastern Nigeria call for some form of Integration especially to a proportion (47.62%) with some crop-livestock integration potential. One third of farm households in the area (33.3%) skewed to at most six members. Less than this proportion (25.0%) of the households however, had larger sizes of at least thirteen (13) members, with a relatively larger proportion (41.7%) housing between seven and thirteen members. The size of the farm households in the area ranged from approximately five to fifteen members. Large household sizes have negative implications on effective use of loans and their repayments [14].

Table 2 revealed further that there were more male household heads (67.8%) than female household heads (23.2%) amongst cooperative farm households in the study area. Fifty-seven (57) of these households or 63.3% had access to cooperative loans with 33 or 36.7%

having no access to the loans. Twenty-one (21) or 63.6% of the households in cooperative societies that had no access to loans was on account of having not applied for the loans within the period. Not applying for a loan may not necessarily mean that the affected household did not need the loan but may be on account of not fulfilling internal condition for applying for and getting the loan (S. Boucher, C. Guirkinger, University of California Davis mimeo on choice in rural credit market).

In the cooperative societies involved in this study, minimum loan to members was ₦20, 000.00 with some members getting as much as ₦60, 000.00 on account of some internal criteria. Qualification for these loans requires that a member applicant must have deposited (saved) at least 75.0% (₦15, 000.00) of the minimum of loans from the cooperative union.

Table 2 revealed that 15.2% of farmers who did not apply for the loans did so because they had not saved this minimum amount required by the union's regulation. Another 27.3% of those denied access had not operated as members of the cooperative societies for at least one year. These conditions were necessary and enabled the union(s) attest to true membership of the loan applicants and to his/her commitment to the ideals of the cooperative society. Being a member for at least twelve months will help harmonize any asymmetry to internal information needed by the union and the prospective borrower. Another reasonable proportion of loan applicants (57.5%) were denied access to the loans on account of fact that they had not pay off their previous loans from the union(s). Default in repayment of borrowed funds was thus a risk that hindered subsequent demand as well as willingness to grant further loans from a source.

3.2 Accessed Cooperative Loans, Repayment Performance and Defaults

Table 3 revealed the amount of credit received by members of households of cooperative societies involved in this study and their repayment performances.

Table 3 shows that 57 of the 90 farm households involved in this study received a total of ₦2, 947,140.00 from their cooperative societies and repaid ₦2, 210,230.00 within a required 24 months. The overall repayment performance was 74.99% and was therefore very good. The default rate was therefore 25.01% amongst them. The high loan repayment seen amongst these farm households was attributed to two reasons. First, there was the group pressure of the cooperatives on their member loan-beneficiaries which compelled them to meet up strictly with their repayment obligations with no flimsy excuses. Second, there was existence of opportunities for extra income from non-farm sources to farmers in Aba agricultural zone of the state. This reason was revealed by the amounts reported as repaid loans by the agricultural zones. The Ohafia and Umuahia agricultural zones offered least opportunities for off-farm employments to farmers and this hindered beneficiaries from these zones from earning some extra income to help service their farm loans. This most likely accounted for high default range of 30.51% to 33.72% posted by farmer-beneficiaries in Ohafia and Umuahia zones compared to low default range of 12.25% to 16.21% posted by farmers in Aba agricultural zone. However, the reasons for the observed defaults reported by farmers were, short duration allowed for repayments; and unfavourable farm input/output ratios.

Table 2. Characteristic of cooperative societies and farm households in Abia State Nigeria, 2012

Variable	Number	Mean of continuous variables n=90	Percentage (%)
Annual Farm Size (Hectares):			
≤ 1.0	34	0.84	40.0
1.0– 3.0	36	2.72	43.3
>3.0	20	5.26	16.7
Household Size (Number):			
1- 6	30	4.84	33.3
7 – 13	35	7.91	41.7
>13	25	14.82	25.0
Gender of Household Head			
Male	61		67.8
Female	29		23.2
Access to Loan status:			
Had access to cooperative loan	57		63.3
Had no access to cooperative loan	33		36.7
Reasons for no access to cooperative loan:			
Did not apply for credit	21		63.6
Applied but application was rejected	6		18.2
Just applied, awaiting for reply	4		12.1
Withdrew request after being granted loan	2		6.1
Total	33		100.0
Reason for Rejection of Application For Cooperative Loan			
Did not saved at least N15,000.00 as required	5		15.2
Have not operated as member for at least one year	9		27.3
Did not completely pay off previous loan (default)	19		57.5
Total	33		100.0

Source: Field survey: 2012 N150.00 ≈ US \$1.00

Table 3. Loan received, repayment and default by cooperative societies in Abia State, Nigeria

Agric.zone	Cooperative society	Number of beneficiaries	Loan received from coop (₦'000)	Amount repaid (₦'000)	Percentage repayment (%)	Amount not repaid (₦'000)	Percentage default (%)
Ohafia	Umuasua FMCS Isuikwuato	5	175.00	118.00	67.43	57.00	32.57
	Ugwu Nkpa FMCS Bende	9	379.00	251.19	66.28	127.81	33.72
	Ulonna South FMCS Afugiri	11	563.00	392.17	69.66	170.83	30.34
	Oganihu cassava FMCS Itu Olokoro	10	507.00	352.30	69.49	154.70	30.51
	Progressive FMCS Umuara	12	719.00	602.45	83.79	116.55	16.21
Aba	Isiala-Okpu Osisioma Ngwa						
	Solace FMCS Mgboko Umuete Obi-Ngwa	10	604.14	530.12	87.75	74.02	12.25
Total		57	2,947.14	2,210.23	74.99	736.91	25.01

Source: Field survey: 2012 ₦150.00≈ US \$1.00

3.3 Determinants of Access to Farmers Cooperative Loans

Table 4 shows that the number of years of farming, taking farming as major occupation, years of farmers' membership to cooperative society, and farmer's deposit/savings in the cooperative society are factors that positively and very significantly ($P=0.01$) influenced access to loans in cooperative societies. This means that highly experienced farmers that had long been members of cooperative societies, and have deposited reasonable sums of money with cooperative societies as savings had unhindered access to loans from the societies. These factors emphasized that devout commitment to ideals of cooperative movement assures members access to available loans in a cooperative society. Other factor that positively influenced access to cooperative loans was members demanding for credit after being denied loan(s) from formal sources (spillover demand). This factor had a moderate but positive significant ($P=0.5$) influence on access to cooperative loan.

Table 4. Bivariate probit determinants of farm household access to cooperative loans in Abia state

Independent Variable	Parameter Code	Probit estimator Coefficient	t-value
Constant	β_0	-3.34***	-6.45
Farm Size	FS	0.062	0.471
Number of years of Farming	EX	0.084***	3.44
Major Occupation	OC	0.0018***	9.41
Credit Demanded	CD	-0.0048	-0.072
Refused Credit by Formal source	CR	3.51**	2.92
Household size	HS	-0.016	-0.521
Years of Membership in Cooperative	YM	0.009***	4.324
Gender	GD	1.92	1.371
New Entrant to Cooperative	NE	-1.44	-1.422
Previous Credit in Default	PD	-0.026**	-2.63
Interest Charged on Loan	IC	-0.992	-1.54
Savings/Household Deposits in Cooperative	SV	0.00023***	3.21
Pseudo R ²		0.721	
Log Likelihood		-74.821	

Dependent Variable = Access to Cooperative credit yes=1; Otherwise=0. ***=Significant at 1.0%; **=Significant at 5.0%; * = Significant at 10.0%. Source: Field Survey, 2011/2012

The only factor that had a negative significant influence on access to cooperative loans was previous credit in default. This factor had a moderate ($P=0.5$) significant influence on accessibility to farm credit. The implication was that higher amounts of farm loans in default created less chance for easy access to more credit from a source. Thus, high default in repayment of borrowed fund(s) constituted blocker to any aspiring borrower. Truly, a well managed source of loan that crave for sustainable credibility should frown at loan defaults and could freely deny chronic defaulters access to subsequent loans. This at best was to convince prospective loan applicants of the need to appreciate paying back their debts on schedule. It is important to mention that gender as a factor was not significant in influencing access to cooperative loans. This was on grounds of the principle of no discrimination on gender of members that govern cooperative movement. Male and female members had equal opportunities to getting cooperative loans provided the member loan applicant had met other loan management requirements. The goodness-of-fit as measured by the pseudo R² showed that the chosen explanatory variables in the probit model explained variations in access to cooperative loans in the state. This was 0.721 or 72.1% and was adjudged high

enough. The log likelihood -74.821 indicated the slope of the curve explaining access to loans was significantly different from zero at $P= 0.05$.

4. CONCLUSIONS AND IMPLICATIONS TO POLICY

Farmers in Abia state belonged to registered cooperative societies from where they derived benefits and bettered their lots. Farm credit generated within these cooperatives was recycled in the societies as members borrowed and repaid their loans. As many as 57 of the 90 farm households involved in this study received a total of ₦2, 947,140.00 from their cooperative societies and repaid ₦2, 210,230.00 within a required 24 months period. Though the overall loan repayment performance was very good there was still concern to remedy the observed default rate. Default in repayment of borrowed funds is a risk that hinders subsequent demand as well as willingness to grant further loans from a source. Socioeconomic factors like number of years of farming, taking farming as major occupation, years of farmers' membership to cooperative society and farmer's deposit/savings in the cooperative society were factors that positively and very significantly influenced access to loans in registered cooperative societies. Another factor that positively and moderately influenced access to cooperative loans was demand for credit as last resort after being denied access to loan(s) by formal sources (spillover demand by members). The factor that had negative and moderate significant influence on access to cooperative loans was 'default in repayment of previous credit'. There was however no discrimination in granting access to credit by the cooperative societies on basis of gender. This was in line with the principles governing the cooperative movement. The cooperative societies accommodated their members who had no access to formal loans and this agreed with 2005 findings of Guirkinger (C. Guirkinger, The University of California Davis, report of research with fellowship of International Dissertation Field Research program-Social Science Research Council) in rural Peru.

It is part of motivational policy for farmers who are yet to join cooperative societies to do so and participate actively in line with agreed principles of the union to enjoy all rights and privileges of being a member including getting easy access to credit. Participation of farmers in cooperative business should be stimulated by cooperative societies themselves allowing members unhindered access to credit facilities. Cooperators who benefit from union loans should learn to repay reasonably within agreed period of use of the loan to avoid being in default of repayment. This will guarantee them unhindered access to loans on request in future. They can achieve this by investing their credit on enterprises that guarantee quick financial returns and where opportunity exists, should combine farm work with some viable off-farm jobs to earn some extra income. This means striving to maintain increased cash flows within the competences of their loan portfolios.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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