DETERMINANTS OF AGRO-CREDIT REPAYMENT OF SMALL- HOLDER FARMERS IN TANZANIA

ABSTRACT

The study investigated the determinants loan repayment in the two selected districts of Kongwa in Dodoma region and Kilombero in Morogoro region of Tanzania. Objective of the study was to identify the determinants of agro-credit repayment of small-holder farmers in Tanzania. The main problem in this study is the existence of high rates of non-compliance to Agrocredit transactions among smallholder farmers. Primary data were collected with the aid of structured questionnaire and key informants. Using a multistage sampling procedure, a total of 329 loan beneficiaries in the four segments namely; commercial banks, microfinance institutions (MFIs), government institutions and moneylenders were purposively and randomly selected and interviewed in the two districts. A Logistic (logit model) regression analyses was carried out to isolate and examine the determinants of loan repayment from the respondents' perspective. Findings revealed that the variables of farm size, type of crop, farming experiences, interest rates, and multiple borrowing were the main determinants of loan repayment. The findings also revealed that credit default rate was caused by high interest rates and loan access' denial from commercial banks due to lack of bankable collaterals. The evidence from the analysis of the study indicating that farmer's credit repayment is based on many factors which statistically proved significantly in both inferential and descriptive findings. Therefore, the study recommended the need for government to support the establishment of central collateral registry sometimes referred to as secured transactions which will unlock credit to smallholder farmers and assure them access to credits from both formal and informal sources at relatively low interest rates.

Key words: Loan repayment, Credit sources, Agrocredit, Tanzania, Compliancy, Small-holder farmers

Background Information

Loan-repayment performance is largely affected by factors related to the borrower, the firm itself, the loan and the lender (Nawai and Shariff, 2010). Among these factors, many studies concentrate on the borrower as the core of the problem. Most of the studies stated that, when the loan is not paid, it might be a result of the borrowers' unwillingness and/or inability to repay (Wongnaa and Awunyo-Vitor, 2013; Pasha and Negese, 2014; and, Colye, 2000). Unstable prices or agricultural inputs and outputs, interest rates, and the borrowers' social

relations and responsibilities may influence the credit repayment-performance of the lending agencies. The negative effect of these factors may lead to the failure of these agencies (Mohammed, 2005). Monitoring the borrowers is an important aid in making sure that they are using the loans for the right purposes meaning that they can pay back their loans (Pasha and Negese, 2014; Kuye *et al*., 2015). Looking at the borrowers' past record is another criterion to determine if the borrower is likely to repay the loan or not (Pasha and Negese 2014; Ali, 2013). Borrowers with no training related to their agribusiness have a higher possibility to default (Roslan and Zaini, 2009). The lending firm characteristics may also affect their repayment performance. (Oke *et al*., 2007). A firm's poor management procedures may contribute to most of the default. The loan volume may be another issue to discuss. Awunyo (2012) stated that the larger the loan size, the lower the probability of repayment default. A poorly designed lending program and improper implementation may lead to defaults (Copisarow, 2000). To minimize the loan default in the process of loan repayment, both the borrowers and the institutional characteristics are important and should be taken into account (Derban *et al*., 2005).

In many developing countries, economies are agriculturally based and thus credit is as a major component of agricultural and rural development programmes and also considered as an important instrument in helping small farmers and micro- entrepreneurs increase their income. Numerous programmes have been established to increase the volume of credit to serve this purpose. According to Nwachukwu *et al* (2010), credit is an important instrument for improving the welfare of the poor directly through consumption smoothening that reduces their vulnerability to short term income. It also enhances the production capacity of the poor resource farmers through financing investment in their human and physical capital. According to Dadson (2012), the question of repayment of loan by farmers is one of the important issues since it influences access to credit by the farmers.

Reduced production and productivity in agriculture is generally attributed to the use of poor technology resulting from limited access to credit. According to (Dong and Feathersone, 2010; Dadson, 2012), in order to increase agricultural productivity especially among the smallholder farmers and to assist poor rural households in maintaining food security, many governments in developing countries initiated credit programmes with the idea that rural smallholder farmers will have access to formal sources of credit. Moreover, it is perceived that inadequate credit facilities has to a large extent discouraged the entry of youth to the farming and fishing sectors, and leave majority of them unemployed because of lack of investment capital and incentive. Islam *et al.*, (2014) asserts that adequate availability of credit on time is an important requirement for the rural people, particularly under conditions of scarcity of resources and uncertainty. Convenient and safe-saving facilities are perhaps even more important to smooth out the peaks and troughs in incomes and expenditures in the rural arena. Lack of savings facilities also force families to rely on inefficient, inconvenient and costly alternatives; agricultural credit can be a solution for this perspective.

Supporting the argument, Bolarinwa and Fakoya (2011) explored that with insufficient funds, farmers and fishers cannot invest in new equipment and machinery, and it becomes difficult to reach out to new markets and products. They further contend that without financial assistance, small farmers and artisanal fishermen cannot cope with temporary cash flow problems, and are thus slowed down in their desire to innovate and expand. The general perception is that access to external finance is critical for poor entrepreneurs, who may never have funds proportional to their ambitions. Bolarinwa and Fakoya, (2011) contend that, farmers access to credit facilities is supported to be an accelerator of agricultural development through a wide spread break away from traditional technology and by fostering the generalized adoption of developed and improved technology. Flores (2004) corroborating

this assertion "stated that institutional credit if made available to farmers could ameliorate some of the farmers problems such as small farm size, low output, low income and low social –economic status. It can also relieve farmers of the excess interest imposed on them by the informal creditors who usually charge high interest rate of between 100-300 percent per annum.

Gilla and Lassalle (1994), as cited by Arinaitwe and Mwesigwa (2015) show that rapid development reached in Europe and Asia was highly facilitated by the availability of credit to the majority. Countries like India, Indonesia, Burma and even China were reported to have recorded a good pace of development after managing to solve problems of credit availability for the majority.

The review from different studies, experiences and countries revealed that there are many factors that influence repayment of credit. Formal agricultural credit programmes have been popular in Low-Income Countries (LICs) with substantial involvement of both national governments and western donors. The fundamental reason for the popularity of credit programmes is that economies of these countries are largely dependent on smallholder agriculture whose farmers have little capital of their own (Kamajou, 1978: Kinimoz, 1982). Credit can be considered from its ability to energize or motivate other factors of production. It can make the latent potential or underused capacities functional. In such situation, credit acts as a catalyst or elixir that activates the engine of growth, enables it to mobilize its inherent potentials and to advance in the planned or expected direction (Oladeebo and Oladeebo, 2008). Another important aspect in credit borrowing and lending is loan repayment because defaults discourage the financial institutions from refinancing the defaulting members, which put the defaulters once again into vicious circle of low productivity. Repayment performance is the ability of a borrower to service his loan effectively as to and

when loan installments fall due. Imbuga (2014) posits that repayment performance refers to the total loans paid on time as stated in the loan agreement contract and repayment performance measures are based on the degree of arrears.

A study by Kuye *et al*., (2015) on Determinants of Loan Default and Repayment Rates by Cassava Farmers in the South-South Nigeria exposed that adequate monitoring and timely disbursement of approved loans during the farming season was very crucial factors for loan repayment. Another important was the volume of the loan, where stressed that farmers should be encouraged to obtain more loans to support cassava-based production because large loan size will enhance the beneficiary farmers‟ access to basic inputs and improved farm management opportunities which could enhance cassava production in South-south Nigeria, in turn loan repayment.

Kohansal *at al*., (2009) studied the factors influencing on repayment performance of farmers in Khorasan-Razavi province of Iran during 2008. Results showed that farmer's experience, income, received loan size and collateral value have positive effect while loan interest rate, and total application costs and number of installment implies a negative effect on repayment performance of recipients. Farming experience and total application costs are the next factors respectively. In spite of the importance of loan in agricultural production, its acquisition and repayment are fraught with a number of problems especially in the small holder farming (Awoke, 2004). Osakwe and Ojo (1986) reported that large rate of default has been a perennial problem in most agricultural credit schemes organized or supported by Nigerian government. Most of the defaults arose from poor management procedures, loan diversion and unwillingness to repay loans. A lot of studies have noted the indispensability of credit in the process of socio-economic transformation (Nnadozie and Uzoigwe, 2002).

Mohamed (2003) made the assessment of formal and quasi-formal credit accessibility by smallholder farmers and artisanal fishermen. The study also attempts to assess the impact of credit on the standards of living of credit users in Zanzibar. Results showed that there many defaults due to Poor loan appraisal systems, weak capacity of lending institutions**,** lack of collateral/security, poor marketing problems and attitude of people towards loans from government sources.

The specific of objectives of this study are as follows:

(i)To examine the influence Time of Loan Repayment to smallholder farmers' repayment of agrocredits from different institutional arrangements, (ii) To determine whether multi-loans borrowing enhances or inhibits agrocredit repayments to lenders and (iii) To analyze the influence of compliance factors on the likelihood of agrocredit borrowers' repayment.

Research Methodology

Research technique and study area.

A total number of 329 respondents were drawn from two districts namely Kilombero in Morogoro region and Kongwa in Dodoma region. These districts have been selected due to the fact that they have farmers who borrow frequently from lenders for farming and have intensive agrocredit demand. The former was due to the presence of Kilombero Sugar Company and Kilombero Plantations Limited (KPL) and the latter, existence of Kibaigwa International Cereal Market. A multi-stage technique was used; the first stage involved the selection of credit sources using purposively sampling technique from which the sample of respondents was drawn. Four main credit sources were selected and studied namely commercial banks, microfinance institutions, Government institutions and Moneylenders. A Likert scale questionnaire was designed to measure the opinion or attitude of respondents by estimating the effects of shocks in respect to loan repayments. Summated scales consisted of a number of statements which expressed either a favourable or unfavourable attitude towards the given object to which the respondent is asked to react. Four explanatory variables; Forms

of Coercion, Unanticipated Farm output Shock (Crop/income loss due to pests and diseases or natural calamities), Loss of Reputation and Feeling Shame/Guilty were used in the descriptive statistical analysis against dependent variable. The means weights were determined which are common perspectives or opinions of all respondents. The scale had the following ratings: Strongly agree =1; Agree = 2; Undecided = 3; Disagree = 4 and Strongly disagree = 5. In addition, a Likert scale weighted score was applied in each arrangement to obtain some data concerning loan repayment. The questions posed were, Time taken from application to granting, Conditionality (Collateral, Security), Grace period, Interest rate, Loan limits, Time of repayment, Transparency, Distance from credit source to homestead, Close evaluation and scrutiny of the borrower before granting a loan. The Ratings were the questions stand as follows: **- 1.Very** Good, 2. Good, **3**.Fair **4.** Bad **5**.Very Bad. The second stage involved the selection of smallholder farmers who have benefited from micro-agro credit loans where time of repayment has been already expired. This was to establish two outcomes of the study, means defaulted or repaid.

Data analysis

The model one is implicitly specified as follows; $C = f(CF_1, CF_2, CF_{3+}\ldots. CF_k + e)$ …….eq (1)

The model is explicitly specified as follows; $C = \beta_0 + \beta_1 CF_1 + \beta_2 CF_2 + \beta_3 CF_3 + \ldots.. CkF_{k+} e;$ ……eq (2)

Whereas: C = Loan compliance

$\beta_1 CF_1$ = Time of Loan repayment

$\beta_2 CF_2$ = Multi – loan borrowing and

$\beta_3 CF_3$ = Likelihood off factors affecting loan repayment

βo = regression intercept

β_{1-3} = Parameter estimates and

e = error term

RESEARCH RESULTS AND FINDINGS

Descriptive and logistic regression statistical analyses were carried out to determine the most influencing factors on loan repayment among seven selected independent variables. Logistic analysis was used to determine the combined effects of distance, interest rate, crop type, loan size and time of repayment. Independent variables plays an important role in determining how a borrower react to repay or not in a given contractual setting (Lwezaura and Ngaruko, 2013).

Results and discussion of descriptive analysis

This section gives results of the statistical descriptive analysis of the study on the determinants of loan compliance and access with specific sub themes including discussions on the following variables:

Shocks: A Likert scale questionnaire was designed to measure the opinion or attitude of respondents by estimating the effects of shocks in respect to loan repayments. Summated scales consisted of a number of statements which expressed either a favourable or unfavourable attitude towards the given object to which the respondent is asked to react The results of the analysis are presented in table 1 below:

Table 1: Shocks

Variable	N	Mean	SD
Forms of coercion	276	1.76	1.161
Unanticipated farm output shock	299	2.31	1.288
Loss of Reputation	299	2.08	1.145
Feeling shame/guilty	299	2.12	1.145
Loss of Mult-relationship	299	2.20	1.418

The findings in the table 1 show that forms of coercion was the most common shock to borrowers (Mean= 1.76, SD=1.161) compared to other shocks. This means that borrowers are more likely to pay back their loans due to forms of coercion compared to the rest of the shocks. This is due to the fact they involve court actions. In addition, loss of reputation was second shock (Mean = 2.08, SD=1.145) followed by feeling shame/guilty (Mean=2.12, SD=1.145). The fourth shock was loss of multi-relationship (Mean =2.20, SD = 1.418) and the last shock was unanticipated farm output shock (Mean =2.31, SD = 1.288).

Distance: The results of findings of descriptive statistical analysis in table 2 and 3 analyzed the variable of distance as a cost. The variable was analyzed to establish its influence on loan repayment and access. It was measured in terms of amount of fare paid (in shillings), time spent (in hours) and the distance from borrowers homestead to the credit supplier's office/place. It also analyzed if the issue of distance and fare have influenced loan access or not. The results of the analysis are presented in the table below as follows:

Table 2: Distance from credit source to homestead

Variable	N	Mean	SD
CB	72	3.08	1.058
MFI	201	2.00	1.231
GI	8	3.25	1.581
ML	88	2.26	1.109

The results (in Table 2) revealed that it takes relatively long distance for the borrower homestead to GI and CB compared to other credit sources (Mean =3.25, SD=1.581 and mean= 3.08, SD =1.058) respectively. This means therefore that borrowers incurred more transaction costs especially search costs in securing loans from these two sources. The credit sources ML (mean =2.26, SD = 1.109) and MFI (mean =2.00, SD = 1.231) have short distance to credit sources and therefore low transaction costs.

Table 3: Distance from credit source to homestead

Variable	Response	Frequency	Valid Percent
Distance from Homestead to Lender	Below 1 km	247	79.4
	1-20	21	6.8
	21-30	11	3.5
	31-40	5	1.6
	41-50	27	8.7
	Total	**311**	**100.0**
Time Spent from Homestead to Lender	< 1hr	179	56.5
	1 - 1.5	55	17.4
	2 - 3	35	11.0
	4 - 5	15	4.7
	4 - 6	33	10.4
	Total	**317**	**100.0**
Amount of Fare Paid from Homestead to Lender	500 - 1000	170	55.6
	1100 -2500	30	9.8
	2600 - 500	8	2.6
	3600 - 500	25	8.2
	4600 - 000	73	23.9
	Total	**306**	**100.0**
Amount of Fare and Distance contribute to get a Loan	Yes	133	51.2
	No	127	48.8
	Total	**260**	**100.0**

The results of the analysis (Table 3) show that the majority of farmers (79.4%) their homes are located near to lenders' offices for a distance of less than 1 kilometer. It also revealed that time spent from their homestead to the lender's premises was less than 1 hour. Furthermore, more than half of respondents (55.6%) show that the amount of fare paid to the offices were ranging from 500 to 1000 shillings; 23.9% paid 4,600 to 5,000 shillings; 9.8 per cent paid 1,100 to 2,500 shillings; 8.2% paid 3,600 to 4,500 shillings and only 2.6% their fare were ranging from 2,600 to 3,500 shillings. However, despite of the majority showing coming closer to the lenders offices; almost half (51.2%) of borrowers claimed that distances and amount of fare paid contributed much to loan access. This means that those who could not afford to incur travelling and meet

subsistence expenses would not be able to access loans.

Time of repayment: The purpose was to check the influence of time given on loan repayment, either short or long periods which record better repayment rates. In addition, we also wanted establish the perceptions of borrowers on the time repayment specified on their contracts entered. Results are indicated in table 4 below:

Table 4: Time of repayment for Different Credit Source

Variable	N	Mean	SD
CB	70	3.07	.953
MFI	200	2.74	1.081
GI	8	2.88	.835
ML	88	3.20	1.084

The results in table 4 above revealed that MFI has a relatively good time of loan repayment compared to other credit sources (Mean =2.74, SD=1.081). The second credit source that also has fair time in loan repayment was GI (mean= 2.88, SD =0.835). It was also revealed that ML (mean =3.20, SD = 1.084) and CB (mean =3.07, SD = 0.953) have comparatively bad time of loan repayment compared to other credit sources. These results indicate the time of repayment given to borrowers from two lenders namely MFI and GI were considerable for them to produce and make repayment. Time of repayment for ML was indicated short. Short payback period do not allow the borrower to produce profitable to break even and be able to repay. Pasha and Negese (2014) found that repayment period was significant determinant of loan repayment performance of borrowers. Suitability of loan repayment period for borrowers was found to significantly increase the probability of repaying loan.

Results of the logistic regression analysis

In this section, we provide the discussion of the results of logistic regression analysis of the factors affecting loan repayment by farmers. The explanatory variables (time of loan repayment, loan size, interest rate, multiple borrowing, transaction costs, shocks and type of crops) as predicting variables to outcome variable were used.

Table 5: Factors Determining Loan Compliance

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Loan Size	.002	.003	1.385	1	.239	1.040
Shock	-.003	.026	.011	1	.917	.997
Interest Rate	.015	.007	5.398	1	.020	1.016
Time of Loan Repayment	-.011	.007	2.423	1	.120	.989
Transaction Cost	.004	.002	1.381	1	.240	1.020
Type of Crop	-.732	.309	5.623	1	.018	.481
Single Borrowing	1.010	.345	8.570	1	.003	2.746
Constant	-.065	.710	.008	1	.927	.937

The interpretation of the results presented in Table 5 above can be presented as follows: the **Wald** estimates give the importance of the contribution of each variable in the model; the higher the value, the more important it is. The table shows that single loans, interest rate and type of crop were found to be important factors (statistically significant) in explaining the borrower's loan repayment; with p-values of 0.003, 0.020 and 0.018 respectively at a significance level of 5%. The findings presented in Table 5 further showed that borrowers with single loans were 2.746 times less likely to default than the borrower with a multiple loans. Thus the more loans borrowers took may indicate the higher the loan burden and less ability to manage loans and, therefore, the more likelihood of loan repayment default. In addition, the findings show that borrowers that invested in perennial crops were

$2.079\left(\frac{1}{0.481}\right)$ times less likely to default than those who invested in annual crops. Moreover, the results show that as interest rate increases, the borrowers were 1.106 times more likely to default.

In regards to loan size of borrowers, the results show that as loan size of borrower increases the likelihood to default also increases (odd ratio =1.04) however, the relationship was not statistically significant at 5% level. In addition, the results show that as transaction costs increases, the likelihood to default also increases (odd ratio =1.02), however, the relationship was not statistically significant. . Furthermore, with respect to shock, the results show that as shock of borrower increases, the borrowers were $1.003\left(\frac{1}{0.997}\right)$ times less likely to default however, the relationship was not statistically significant . In addition the findings revealed that as time of loan repayment increases, the borrowers were $1.01\left(\frac{1}{0.989}\right)$ times less likely to default, however, the relationship was not statistically significant .

The logit regression coefficients established that transaction costs and loan size had a positive and not statistically significant coefficient with loan repayment status. The results are similar to those of Kohansal and Manosoori, (2009) who established that the amount of loan approved or received, that is loan size, could have a positive effect on repayment performance though not statistically significant. Other variables which were tried in the model but were statistically insignificant include time of repayment and shocks.

In the discussion with key informants and farmers, majority of the borrowers interviewed failed to repay loan balances on time due to high interest rates charged on their principal amount. In most cases, high interest rates discourage business to grow in the sense that a big part of the profit generated goes back to the credit suppliers to service the loan that was once

given to the borrower and their profit. In line with the findings, Vogelgesang (2003) argues that lower repayment rates may lead to less favourable credit conditions for the poorest borrowers, for example, when interest rates are raised, which may consequently lead them to drop-out from the loan portfolio of the MFI. Igwe and Egboson (2013) contend that high interest rates were the most important constraints of the borrowers to repay loans in study area. Study by Kohansal and Nahvi (2014) identified interest rate has a positive and significant influence on the loan repayment. It shows that the probability of non-payment increases by 51 per cent if loans interest rate increases by 1 per cent, means that, a smaller rate of interest provides better conditions for repaying a loan. World Bank (2004) asserts that, interest rates guidelines given by most credit supplies have been perceived as exorbitant and exploitative. Makorere, (2014) indicates that slow credit disbursement and high interest rates significantly deter repayment. Furthermore, the findings agreed with Bernard *et al*., (2014) who reported that lower interest rate would enhance loan repayment and recommended the credit suppliers to lower interest rate so as to ease repayment burden since the level of interest rates has a significant effect in premium repayment. In addition, it discourages the financial institutions from refinancing the defaulting members, which put the defaulters once again into vicious circle of low productivity. In our discussion with CRDB Bank loan manager, he disclosed that currently they are no longer offering loans to paddy producers due high default rate averaged at 78 per cent. Awunyo-Vitor (2012) has reported in his empirical studies that large rate of default has been a major problem in agricultural credit delivery and sustainability, consequently large proportion of formal financial institution has suspended agricultural credit. Olagunju and Adimo (2007) study also verified this finding. They concluded that as loan interest rate is smaller, financing costs will decrease for loan-takers and loan repayment will be easier.

Conclusion

The evidence from the analysis of the study indicating that farmer's credit repayment is based on many factors of which interest was the leading cause for case of credit sources. The analysis was also carried out to evaluate the influence of selected predicting variables against dependent variable. Independent variables tested were transaction costs, shocks, credit sources, loan size, interest rate, type of crop and time of repayment. The results declared that interest rate and type of crop were statistically significant. Furthermore, results on the influence of transaction cost and sources of credits, showed that government institutions as a source of credit had a positive and statistically significant with loan repayment. Search transaction costs and loan size were more important variables explaining the influence of loan repayment but were not significant. Analysis was also carried out to determine the effect of multiple borrowing on loan repayment and logistics result revealed that single borrowing was significant.

Recommendations

The findings of the study showed that smallholders' farmers have always found it difficult to obtain credits from formal banks because they have no bankable collateral to offer for the loan, therefore excluded from formal financial services. This requirement has forced the borrowers to look for the loans informal sources which are attached with high interest rate yet not offer insufficient amount to cover the demand of the farmer. The formal banks used collateral requirements as a screening mechanism to counter the problem of information asymmetry in credit markets. The exclusion of the poor who make about 80 per cent of Tanzanians has repercussions ranging from worsening unemployment levels, inaccessibility of the poor to quality education, health services, and malnutrition. We therefore recommend that the government should establish collateral registry system (secured transactions) where

productive assets of these farmers can be depleted, transferred from the poor to wealthier assets. Under this system, farmers could use movable assets to guaranty credit. These assets including like growing and harvested crops, agricultural goods in warehouses or other storage, livestock, inventory, equipment, accounts receivables, bank deposits, securities, intellectual property rights, rents, contractual rights, and other moveable assets limited only by the creativity of the commercial sector in finding ways to create sources of economic value. It also recommends that lenders increase loans volumes to borrowers in order to meet borrowers demand and reduce lending rate by taking the advantage of the economies of scale.

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Authors:

1. Dr. Sylivatus Berati Kashaga (PhD)
   Ministry of Agriculture
   P.O Box 2182
   DODOMA, Tanzania.
   E – mail : sypaul2001@yahoo.com

2. Prof. Deus Dominic Ngaruko (PhD)
   Open University of Tanzania
   P.O Box 23409
   DAR ES SALAAM, TANZANIA.
   E – mail: ngarukoddp@yahoo.co.uk