FACTORS INFLUENCING SEDA AGRICULTURAL CREDIT RATIONING TO SMALLHOLDER FARMERS IN DODOMA MUNICIPALITY AND BAHI DISTRICT, DODOMA, TANZANIA

ERASTO ABRAHAM

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ABSTRACT

This study was conducted with the aim of assessing factors that influence SEDA agricultural credit rationing to smallholder farmers in Dodoma Municipality and Bahi District. Purposive and random sampling techniques were employed in selecting 200 smallholder farmers. Binary logistic and linear regressions models were used to analyse the influence of farmer's socio-economic characteristics on credit demand and factors influencing SEDA agricultural credit rationing respectively. Descriptive statistics were used to assess the performance of SEDA credit scheme. Variance in Difference (DID) was used to assess the contribution of credit to farmer's income. The results of binary logistic indicate that extension service, household size, average hired labour cost and information on SEDA existence influenced credit demand at 1% level of significance. In addition, linear regression indicated that amount of savings, experience with SEDA credit, and physical distance from SEDA office influenced credit rationing significantly at 1% level of significance. Furthermore, as loan repayments, the overall repayment rate was 97%, 98% and 96%, 95% for Dodoma Municipality and Bahi Districts at the end of 2010 and 2011 seasons respectively. DID results reported borrowers to have higher mean income over non borrowers by TZS 141 005 and TZS 186 980 in Dodoma Municipality and Bahi District respectively. It is concluded that a package of interventions is needed for improving farmers socio-economic characteristics prior for securing SEDA agricultural credit facility. This may call for some changes in SEDA lending policy and empowering smallholder farmers in order to remove supply and demand side barriers in SEDA credit system.

DECLARATION

I, Erasto Abraham, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted in any other institution.

_____   _____

Erasto Abraham   Date

(Msc. Candidate)

The above declaration is confirmed.

_____   _____

Dr. Jeremia R. Makindara   Date

(Supervisor)

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DEDICATION

This work is dedicated to the Almighty God the giver and the ever loved, under whose care I did my studies safely and successfully.

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LIST OF ABBREVIATIONS AND ACRONYMS

AAAE   Africa Association of Agricultural Economist

ACA   Agricultural Credit Agency

ACPC   Agricultural Credit Policy Council

ADB   Asian Development Bank

AEASA   Agricultural Economic Association of South Africa

BA   Branch Accountant

BCC   Branch Credit Committee

BDC   Bahi District Council

BM   Branch Manager

BoT   Bank of Tanzania

CED   Chief Executive Director

CO   Credit officer

CRDB   Co-operative and Rural Development Bank

DEC   Data Entry Clerk

DED   District Executive Director

DFA   Director of Finance and Administration

DID   Difference in Difference

DMC   Dodoma Municipal Council

DO   Director of Operations

ED   Executive Director

FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GoT	Government of Tanzania
GTO	Group Training and Orientation
HRM	Human Resource Manger
ICA	International Co-operative Alliance
ILO	International Labour Organization
IMF	International Monetary Fund
LDLF	Local Development Loan Fund
LICs	Low Income Countries
MAFC	Ministry of Agriculture, Food Security and Co-operatives
MFI	Microfinance Institution
MIS	Management Information System
ML	Maximum likelihood
NBC	National Bank of Commerce
NDCA	National Development Credit Agency
RFF	Rural Finance Fund
ROSCA	Rotating Saving and Credit Association
SEDA	Small Enterprise Development Agency
SMEs	Small and Medium Enterprises
SNAL	Sokoine National Agricultural Library
TRDB	Tanzania Rural Development Bank

TZS   Tanzania shillings

VIF   Variance Inflation Factor

WVT   World Vision Tanzania

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

The review of the theory shows that the agricultural loans market is not perfect, that is, market forces do not lead to a market clearing interest rate. Instead, such a market is mainly characterized by a permanent excess demand for loans, that is, credit rationing (Satta, 2003). Agricultural credit has been rationed and small and medium enterprises have been seriously affected, leading to rickery economic growth. The main possible causes of credit rationing are: Banks´ reluctance to lend, imperfect information, central bank's restrictive monetary policy, lack of institutional framework, a fall in net foreign liabilities, and minimum capital requirements (Satta, 2003).

However, agricultural credit plays a pivotal role in the adoption of improved technologies in the farming sector (Yehuala, 2008). The agricultural credit is normally used as a working capital to purchase farm inputs such as seeds, fertilizers, pesticides and equipments. Farmers need finances immediately after the period of harvesting for the next cropping season for financing the variable farm inputs (Akram *et al.*, 2008). Agricultural credit has been considered necessary for smallholder farmers with little capital, as means of getting access to improved agricultural technology and increase their productivity (Akram *et al*., 2008). Therefore, a number of agricultural dependent, Low Income Countries (LICs) external financing to smallholder farmers has been seen as one of the major means of bringing about the agricultural transformation (Rabo *et al*., 2001).

Agricultural credit is an important intervention to solve rural poverty, and plays an essential role in agricultural development (Meyer, 2000). Expanding the availability and

accessibility of the agricultural credit has been used as a policy to accelerate agricultural and rural development (World Bank, 2000). It is traditionally employed as a tool for providing the priority sector with access to production inputs and enabling production to be increased (Nyika, 2000).

Moreover, it is believed that expanding agricultural credit programmes will have beneficial effects on agricultural production of smallholder farmers and rural income because it could facilitate purchase of costly inputs and adoption of alternative farm crops which will bring them to higher level of productivity and increasing their incomes (Nosiru, 2010). As such, increase in household income is much needed for improving household food security and eventually will come from the gains in agricultural productivity through better technology and more productive crops (Nyika, 2000).

The concern for the provision of appropriate credit systems for smallholder farmers in developing countries has been growing for many decades (Poliquit, 2006). This is because appropriate agricultural credit systems could cater financing needs of smallholder farmers in the rural areas (Lawa *et al.,* 2009; Akram, 2008). Most researchers have recognized that increased access by smallholder farmers to production resources like agricultural credit is needed for increasing food production and thus deserve a particular attention (Nyika, 2000).

Furthermore, many efforts have been made and continuous search for sustainable interventions through appropriate agricultural credit schemes are being conducted to improve the living conditions and quality of life of the smallholder farmers in rural areas (World Bank, 2000). However, such efforts and interventions are often hindered by

various problems which then contribute to the failure of some agricultural credit programmes.

Some credit programmes are not sustainable because of the failure and collapse of some financial institutions, which are due to poor management and lack of good governance (Blackman, 2001). In addition, demands for funds by intended beneficiaries are neglected in the design and implementation of the agricultural credit programmes which caused their failure (Zeller, 2001).

Thus, policy makers and farmers have often identified lack of access to formal credit as a great impediment to agricultural production in developing countries (Llanto, 2005). Therefore, as a way of assisting farmers, the Government of Tanzania (GoT) has established credit schemes to provide financial resources to the agricultural sectors through projects and in collaboration with Non Governmental Organisation (Alabi *et al.*, 2007; Meyer, 2000). Formal credit have been viewed as a means of providing farmers with opportunities for growth by enabling them to procure farm inputs and fixed capital items required for them to operate at a better production level of technology (Mwachanga, 2000).

Agricultural credit is emphasized because of the importance of the agriculture sector in the Tanzanian economy. According to the 2011 Ministry of Agriculture, Food Security and cooperatives report, agriculture contributes about 25.8% of the Gross Domestic Product (GDP) in the country, 34% of the national exports earnings and employs over 74% of the Tanzania population. The sector is dominated by smallholder farmers whose activities are largely labour intensive with limited use of purchased inputs (MAFC, 2011). Small scale farmers are therefore seen as having the potential for increasing the country's

agricultural production. Yet without adequate financial resources these farmers cannot acquire and use improved technology necessary to increase agricultural production.

1.2 Problem Statement and Justification

Agricultural credit provision is one of the principal components which helps to attain rapid and sustainable growth of agriculture (Yehuala, 2008). Agricultural credit is a temporary substitute for personal savings, which catalyses the process of agricultural production and productivity (Rashid *et al.*, 2004). To boost agricultural production and productivity, smallholder farmers have to use improved agricultural technologies. However, the provision of credit has increasingly been regarded as an important tool for raising the incomes by smallholder farmers through mobilizing resources to more productive uses. But as development takes place, one question that arises is the extent to which credit can be offered by financial institutions. Although financial institutions have a primary role of providing credit, there is historical evidence of credit rationing even to creditworthy borrowers by financial institutions all over the word (IMF, 2003).

Nonetheless, two different views concerning the agricultural credit rationing still dominate the debate of smallholder farmer's society. On one hand, there is the viewpoint that the positive effects of agricultural credit rationing outweigh its negative (Yehuala, 2008). On the other hand, there is the view that the negative effects associated with extension of agricultural credit rationing outweigh its positive effects (Akram *et al*., 2008). This study supports the first view with a qualification that the perceived positive effects will be greater than the perceived negative effects if credit rationing is properly planned and established credit bylaws and regulations are enforced. Although agricultural credit is an important intervention to accelerate economic growth among smallholder farmers, and plays an essential role in agricultural development, there is a paucity of

information on why financial institutions ration credits even to creditworthy borrowers. This study was undertaken as an attempt to address this gap based on evidence from a case study of smallholder farmers who are credit borrowers from SEDA in Dodoma Municipality and Bahi District.

Besides filling the existing gap, the results of this study provide useful information on the status of smallholder farmers in accessing agricultural credit from formal credit institutions. This information is vital for policy makers in taking appropriate actions toward facilitating better policies for the establishment and operation of comprehensive and sustainable financial institutions for the development of agriculture and other rural sectors.

1.3 Objectives

1.3.1 The overall objective

The overall objective of this study was to assess factors that influence SEDA agricultural credit demand and rationing in the agricultural sector by the smallholder farmers in Dodoma Municipality and Bahi District.

1.3.2 The specific objectives

The specific objectives were

i.   To investigate socio-economic factors influencing demand for SEDA agricultural credit by smallholder farmers in Dodoma Municipality and Bahi District.

ii. To determine the extent of credit rationing in Dodoma Municipality and Bahi District.

iii. To evaluate factors influencing SEDA agricultural credit rationing to smallholder farmers in Dodoma Municipality and Bahi District.

iv.   To assess the performance of SEDA in loan disbursement and repayments.

v.   To assess the contribution of SEDA agricultural credit to the income of the smallholder farmers in Dodoma Municipality and Bahi District.

1.4 Hypotheses

H_0: Smallholder farmer's socio-economic characteristics have no influence on demand for agricultural credit in Dodoma Municipality and Bahi Districts.

H_0: There is no significant difference in income performance between smallholder farmers with and without access to SEDA agricultural credit scheme.

1.5 Significance of the Study

It is claimed that lack of capital and failure to access attractive investment opportunities are important reasons behind inadequate agricultural development and an overall economic development in many developing countries (Tefera, 2004). That is why an attempt is made in most developing countries to encourage, through development policy measures, capital formation as well as the supply of financial means in the form of agricultural credit through formal and informal financial institutions (Akram, 2008).

This study therefore, provides useful information on the status of smallholder farmers in accessing agricultural credit from formal credit facilities (SEDA). The study results will also benefit the development partners and civil society organisations involved in the provision of agricultural credit facilities to smallholder farmers and in improving the lending procedures in order to provide better services to their clients. Moreover, it is also expected that the study would highlight on the possible link between credit use and increase in income and more importantly on its contribution to household income.

1.6 Organization of the Dissertation

This study is organized into five chapters. The first chapter gives a general background to the study, problem statement, study objectives and hypotheses. The second chapter presents a critical review of the relevant literature while the third chapter presents a detailed description of the study area and methodology employed. The fourth chapter presents results and discussion while the last chapter presents conclusion and recommendations.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Definition of the Terms and Concepts

2.1.1 Credit service

Credit can be defined as the control over money, materials, goods or services in the present in exchange for a promise to repay at some future date (Lawal *et al*., 2009). This implies that, lenders forgo the use of money or its equivalent in the current time by making loans available or extending the credit to the borrower who promises to repay on terms specified in the loans agreement or debt instruments (Barry *et al*., 2001). It is an advance of money or its equivalent given by a lender to a borrower for repayment at maturity, which may range from a few days to several years (Llanto, 2005). Borrowers obtain resources to use for current production/consumption purposes before generating savings that could be used to repay the goods. Credit is also defined by Yehuala (2008) as a transaction between two parties in which one, acting as creditor or lender, supplies the other, the debtor or borrower, with money, goods, services, or securities in return for the promise of future payment.

2.1.2 Agricultural credit

Agricultural credit is the temporary inputs transferred to a willing borrower for agricultural purpose, with the borrower's potential willingness and promise to repay in particular for after use and the confidence by the lender that the borrower will comply with terms, utilization and repayment with, or without monitoring (Admasu *et al*., 2010). It encompasses all loans and advances granted to a borrower to finance activities relating to agriculture and for processing and distribution of products resulting from these activities (Manganhele, 2010).

Lagunju (2007) defined agricultural credit as a branch of agricultural economics that deals with the provision and management of bank services and financial resources related to individual farm units. For the agricultural sector to perform creditably well, credit is essential for the achievements of sound economic and social development, which the nation requires (Akram *et al*., 2008). Agricultural credit involves the study of all economic and financial interfaces between agriculture and the rest of the macro economy including the effects that changes in the national economic policies that could have impact on the economic performance of agriculture as well as the financial positions of individual farm families (Nyika, 2000).

2.1.3 Demand for agricultural credit

Demand for agricultural credit is the willingness and ability of farmers to access existing sources of funds to meet farm investment needs (Udoh *et al*., 2005). It can be considered as the minimum volume of credit that would yield a minimum incremental growth in the profitability of agricultural production units which may be greater or equal to the cost of credit. Demand for credit goes beyond a desire to have a loan because it is available, or because livelihood strategies are constrained to a desire to use the loan to initiate farm business or improve existing commercial farm business (Nyika, 2000).

Demand for credit requires that, farmers make a choice between investing in one agricultural activity/project or the other or investing in an alternative non agricultural project (Udoh *et al*., 2005). It may also require decision to choose between consumption and production in order to achieve a social optimum of generating income for repayment or returns to institutional cost of the credit programme (Zumbika, 2000).

2.1.4 Credit rationing

Credit rationing is broadly defined as a situation where the demands for loans exceed the supply of loans at the going interest rate. Different types of credit rationing have been examined in this literature. Blanchard *et al.* (2008) saw it from the angle of loan size where borrowers receive a lesser amount of loan than they requested at a given loan rate. Credit rationing as defined by Fatoki *et al*. (2011) is the difference between the quantity of loans demanded and loans supplied at the ruling interest rate. Voordeckers and Steijvers (2008) further broadened the classification and identified three types of credit rationing. These are: a) A situation where a borrower may receive a loan of smaller amount than desired; b) A situation where some individuals cannot borrow at the interest rate they consider appropriate based on what they perceive to be their probability of default and; c) A situation where a borrower may be denied credit, when a lender thinks of not being able to obtain its required return at any interest rate. Access to credit does not imply that the demand for credit will be satisfied. Lenders determine how much credit is allocated based on the probability of loan default, often resulting in credit rationing. The probability of default may be influenced by a number of factors that include the expected returns of the project, the terms of the loan, market imperfections and borrower characteristics (Satta, 2003).

2.1.5 Smallholder farmers

Smallholder farmers are defined to include subsistence farmers and semi-commercial farmers. Subsistence farmers comprise the largest group of the rural population, who are still poor, but actively trying to earn a significant part of their livelihood from farming activities, whose cultivation system is predominantly traditional technology i.e. hand hoe (Emerole, 2004). According to Manganhele (2010), subsistence farmers do not strive to

produce saleable surplus from their farming activities. Therefore subsistence farmers are the most challenging potential client segment for providers of financial services.

Semi-commercial farmers, on other the hand comprise a minority of rural population but are the most promising targeting group of smallholder farmers (Tefera, 2004). According to Tefera (2004), majority of the smallholder farmers in this category still use traditional farming technologies like the subsistence farmers. However, semi-commercial farmers are oriented to serve the markets and have progressed in scale of their operations or, if not have at least already demonstrated an ability to manage improved technology. According to Manganhele (2010), it is likely that a large number of semi-commercial farmers would combine part-time on farming and non-farming activities i.e. working in small business including trading farming products and inputs. Unlike subsistence farmers, many semi-commercial farmers are less risk averse and more prone to demand financial services (Nwaru *et al*., 2010).

2.2 Theories of Credit Rationing

2.2.1 Credit rationing

Credit rationing theories are based on informational asymmetries between lenders and borrowers and transaction costs of information search and monitoring (Binks *et al*., 2002). The availability of information in the decision to lend is important because it enables the financial institution to evaluate the risk-return profile of the loan application and hence set the level and terms of credit to be extended to the borrower.

2.2.2 Information asymmetry and credit rationing

Information is a key input that goes into the credit decision of financial institutions (Martha, 2012). Also, one of the challenges for financial institutions is to acquire

information about the credit risk of the borrower, as borrowers have more information than the lender about the projects (Martha, 2012). Furthermore, according to Ongori (2009), full information about the borrower's project may not always be available. This leads to a situation of information asymmetry, which occurs when one party to the lending transaction has more and/or better information than the other. Information asymmetry between borrowers and the financial institutions is reflected in inability of the majority borrowers to provide up to date reliable financial information and realistic business plans which then increases the cost of lending that financial institutions incur while dealing with the borrowers enterprise (Ongori, 2009). Under asymmetric information conditions, financial institutions are uncertain about the future behaviour of the borrower in terms of repaying the loan. Asymmetric information problem are more likely to occur when financial institutions deal with SMEs due to higher opacity of these firms (Berger *et al.,* 2001; Hyytinen and Pajarinen, 2008). By opaqueness the literature means that it is difficult to ascertain if firms have the capacity to pay (have viable project) and/or willingness to pay (due to moral hazard) (Berger *et al*., 2001).

2.2.3 Transaction costs and credit rationing

According to Martha (2012) transaction cost is the risk that financial institutions face when they lack necessary information to distinguish between good and bad borrowers. Existing contract theory argues that financial institutions i.e. banks are not interested in offering credit to Small and Medium Enterprises because it is particularly difficult to overcome information asymmetries and resulting in high transaction cost associated with screening, monitoring, and enforcement problems (Berger *et al*., 2001). Financial institutions could use interest rate to equilibrate the market and allocate credit. However, institutions cannot increase interest rate above certain level because an increase in the interest rate above certain level may worsen the quality of loan in a way that is

unacceptable to the financial institution (Zambaldi *et al*., 2011). The impossibility to use interest rates as screening technology entices lenders to use non-interest screening devices based on the characteristics of the borrower and attribute of enterprises (Lehmans and Neurberger, 2001). As long as borrowers' demographic characteristics are correlated with their creditworthiness, lenders may use the borrower characteristics as a proxy for the risk factor associated with loans (Adesua, 2011). This is the case when lenders cannot observe the risk factors or do not collect relevant information due to the cost involved.

2.2.4 Household characteristics influencing credit demand and rationing

Household characteristics such as age, sex, ethnicity, education, experience and personal wealth determine financial constraints pertaining the business (Lehmans and Neurberger, 2001). Han (2008) argued that entrepreneur's characteristics such as education, experience and personal wealth have strong impact on the severity of financial problem faced by SMEs. According to Olomi (2009), limited managerial capacity demonstrated by lack of formal planning, appraisal and reporting system and structures constraint access to finance by SMEs. Mijid (2009) further argued that low involvement of women entrepreneurs in financial markets can be attributed to at least three main factors: (a) low level of education and lack of training opportunities; (b) heavy household responsibilities that inhibit women's participation in the formal economy; (c) legal, cultural, or religious constraints on the extent to which women can open their own businesses.

Using data from Indonesian small business women found that the representation of women in business is relatively low suggesting that entrepreneurship is still male dominated (Tulus, 2011). Adesua (2011) explored Nigerian female entrepreneurs based on a survey of 132 female-owned firms. The study sought to construct a typology in terms of their demographic characteristics and motivation for going into business, as well as

access to finance when starting or expanding the business venture. The findings revealed that Nigerian female entrepreneurs were particularly constrained by weak financial base and lack of collateral. Many of the women in the study were seen to resort to internal sources of finance for their start-up and working capitals. Adesua (2011) further argued that many of the challenges faced by female entrepreneurs can also be linked to the inferior status of women in many African societies, their underestimation as economic agents, as well as gender bias embedded in tribal and cultural norms. Likewise Blanchflower *et al.* (2003) examined whether financial institutions discriminate against entrepreneurs on the basis of gender. They found some evidence that compared to male managed counterparts; female-managed firms are less likely to obtain loans.

2.2.5 Collateral and credit rationing

The lack of collateral is often viewed as a bottleneck to improve access to credit (Diana, 2008). Inadequate collateral or lack of it implies that the borrower is likely to become credit constrained. Collateral can signal the quality of borrower (Duarte, 2011) and the availability of collateral may decrease moral hazard problem (Guirkinger *et al.*, 2008). Most of the credit institutions are more likely to provide loans if the borrowers can pay back the loan by pledging collateral. As indicated by Duarte (2011), an increase in the availability of land owned by the household should reduce the probability of being rationed. Diana (2008) pointed out that households that have more wealth are expected to have high returns and show higher demand for credit. They are likely to have better access to credit as they may appear to lenders as less risky borrowers. Lenders often demand collateral in order to evaluate the borrower's credit worthiness and to increase the risk- adjusted return to the loan. In previous research, collateral requirement has been regarded as important in the lender's decision to ration credit (Duarte, 2011).

Furthermore, Bougheas *et al.* (2005) contend that collateral reduces the riskiness of a loan by giving the financial institution a claim on a tangible asset without diminishing its claim on the outstanding debt. Coco (2000) point out that collateral is the lender's second line of defence. Collateral can solve problems derived from asymmetries in valuation of projects, uncertainty about the quality of projects and the riskiness of borrowers, and problems related to the cost of monitoring or supervising borrowers' behaviour. If the financial institutions cannot determine borrowers' riskiness (hidden information), then collateral may serve as a screening device to differentiate between good and bad borrowers and to mitigate the adverse selection problem (Menkhoff *et al.*, 2006).

2.3 History and Origin of Agricultural Credit World-wide

The concept of agricultural credit has been known since the 17[th]century, when peasants in China used credit in agriculture to increase their cash income and to improve their standard of living (Ming-te, 1994). Likewise, in Western countries, the German Landschaften was found by Fredrick the Great in 1769 and its principles were used by the federal farms loans systems of the United States. The Raiffeisen Agricultural Bank and Schutze-delitzsch Peoples Bank were established in 1852 which were believed to be the origin of establishment of agricultural credit Worl-wide (Bee, 2007).

According to Heidhues and Schrieder (1999), the origin of agricultural credit concept stem from the necessity of breaking the vicious circle of low capital formation as presented in Fig. 1.

Low per-capita

Low productivity

Low saving rates

Low investment rates
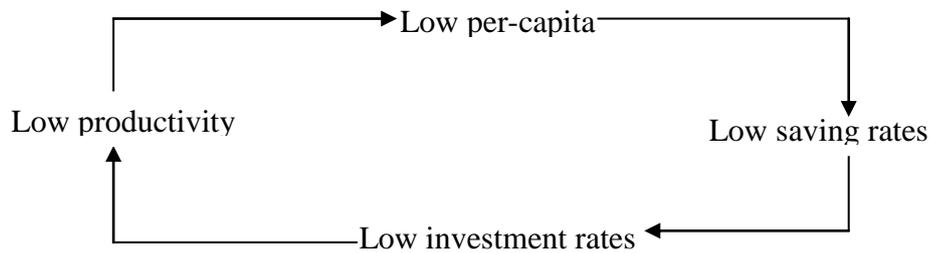
Figure 1: The vicious circle of low per capita formation

Source: Heidhues and Schrieder, (1999)

Figure 1 shows that the formation of capital is influenced by percapita income, saving rates, investment rates and productivity (Bee, 2007; Heidhues and Schrieder, 1999). A low level of any of these factors will impact on low capital formation. It is argued that the role of agricultural credit programmes is to break this cycle, resulting in an increase in per capita income and thus increase in saving rate, investment and productivity (Heidhues and Schrieder, 1999).

2.3.1 Agricultural credit in low income countries

Modernization of small scale agriculture has become a crucial aspect for the economic development of many LICs (Atieno, 2001). As the way of increasing agricultural production, farmers in LICs have been encouraged to adopt new technology supported by agricultural credit. Recently a supply led approach has been used by the majority of the institutions in LICs to provide credit to small farmers (Atieno, 2001).

Observations show that supply led-credit approach has had disappointing results for many institutions (Moshi, 2008), to others has shown little success (Santos, 2001). Other writers such as Llanto (2005); Nyika (2000) as cited by Giraji and Satish (2001) have argued that, with regard to LICs, it is becoming uncertain whether agricultural credit in this form should continue to be supplied by donors. The reason given by the ant supply led-credit

advocates include the scheme being not financially viable, which is partly due to high rates of defaults and low interest rates they charge (Satish, 2001). Such credit programmes have become a form of subsidy that is being misused and is detrimental to development. The authors have further argued that the cheap credit discourages saving which is essential for development. Such credit also leads to insufficient allocation of resources through rationing due to excess credit demand (Omonona *et al*., 2008).

Another important aspect worth noting at this point is the point of collateral. Collateral or security for credit has traditionally been a pre-requisite by credit institutions before issuing credit to small farmers (Diagne *et al*., 2001). This involves valuing of land holdings and capital items which are sanctioned against credit. However, smallholder farmers possess low value capital items and small land holdings without proper certified titles (Diagne *et al*., 2001).

To some credit institutions, however, the outlook on collateral vis-à-vis the smallholder farmers has been changing over time with more emphasis given to credit worthiness in place of common collateral. The new emphasis involves such parameters as the history of loan repayment, trustworthiness and the capacity to repay (Baiyegunhi *et al*., 2010; Nyika, 2000). In addition, other important elements in assessing credit worthiness include the reputation of an individual within the area, the technical feasibility of proposed enterprise, and the expected cash flow generation (Oboh *et al.*, 2011).

2.3.2 Agricultural credit in Tanzania

During the 1950s through 1970s much emphasis was placed on agricultural credit in most developing countries including Tanzania (Mwachanga, 2000). It was envisaged that rapid economic development can be realized through an increase in agricultural productivity

facilitated by enhanced access to technology and subsidized agricultural credit (Adeoti, 2003). The need for subsidized agricultural credit had therefore its origin in two closely related agricultural policies (a) Massive infusion of capital and transfer of technology from developed countries and (b) Job-creation through rural investment, increase of agricultural output through infusion of capital and transfer of technology targeted to medium and large scale farmers, leaving small-scale producers to adopt new technologies through demonstration effects (Khalid, 2007).

According to Kasambala (2008), these policies were found on the following assumptions: (a) Farmers are too poor and cannot invest to improve agricultural production (b) Advancement and innovation in agriculture can only come with support of cheap subsidized credit (c) There is acute shortage of credit in rural areas (d) Informal money lenders are exploitative (e) The government must intervene through specialized credit approach to stimulate demand and induce investment in agriculture.

2.3.3 Specialized credit fund

2.3.3.1 Emergence of specialized credit fund in Tanganyika

The emergence of specialized credit fund institutions in Tanganyika was associated with the passing of the increased production ordinance in 1944 by the colonial administration (Bee, 2007). It was at this time that the idea of formal agricultural credit was accepted and conceived by the colonial government so as to support the move to increase agricultural production among smallholder farmers principally to alleviate food shortage (Bee, 2007). As a result, two agricultural loans facilities were established namely; the Local Development Loan Fund (LDLF) and African Productivity Loan Fund (Ndanshau, 1996). LDLF was a revolving fund established by the government with initial funding from agricultural Development Reserve Fund in order to provide credit mainly to the native

small farmers producers (Ndanshau, 1996). Since the smallholder farmers have no sufficient collateral, the LDLF was to issue loans through local authorities as it was believed that the later being close to the producers, loans recovery would be much easier. Local authorities were better placed to circumvent problems arising from asymmetric information and enforcement in smallholder farmers credit programmes (Derban *et al*., 2005).

2.3.3.2 Re-organization of specialized credit institution

In 1961 the government of Tanganyika replaced the specialized agricultural credit institution with the Agricultural Credit Agency (ACA) in order to mobilize savings and support transformation of agricultural sector (Bee, 2007). These ACA was required to provide short-term, medium-term and long-term loans to individual farmers, co-operatives movements, local authorities, and farming companies for the purpose of improving agricultural productivity and bring rural development (Bee, 2007). The ACA loan system was criticized by not being able to address the credit needs of the smallholder farmers. According to Ndanshau (1996), much of the credit went to the few wealthy farmers who were less risky and easier to manage, hence giving leap attention to smallholder producers. Thus the ACA was also criticized by inadequate staffing who had insufficient skills required in appraising the agricultural projects. Therefore, the performance of ACA was poor in that it did not benefited the targeted group of smallholder farmers, and instead intensified differentiation by creating classes of wealthy and poor farmers (BoT, 2004). Besides, it failed to address the needs for modernization of the agricultural sector as expected; it was therefore replaced by the National Development Credit Agency.

2.3.3.3 National Development Credit Agency (NDCA)

The failure of the ACA prompted the government of Tanganyika to re-organize the institutional structure for agricultural finance so as to increase the availability of credit to farmers (BoT, 2004). As a result, ACA was replaced in 1964 by another agency, National Development Credit Agency (NDCA). The NDCA was charged with the duty of providing the credit for agricultural development, processing, storage and transportation of agricultural produces (Bee, 2007). In order to reduce administrative costs, and at the same time serve better the smallholder farmers, it was decided that NDCA should channel its entire loan through co-operative movements (Bee, 2007). This new structure of the credit services to rural farmers was based on the belief that a smooth flow of credit funds from credit institutions to farmers can best be managed by efficiently functioning co-operatives system. The agricultural extension staffs were given additional tasks of supervising farming and credit businesses at the district level (Bee, 2007).

In its attempts to improve smallholder farmer's agricultural production, the government adopted the dual approach in agricultural development. The improvement and transformation approach that were to be supported by the NDCA. According to Bee (2007), the improvement approach was envisaged to bring gradual improvement in farming methods without altering their social values and norms. On the other hand, the transformation approach aimed at rapid increase in agricultural production through extensive and intensive farming by selected progressive farmers. These farmers were brought together in established settlement schemes and provided with equipments and machinery. The formation of NDCA and its approach to credit management in agriculture, like that of its predecessor were not successful. Nonetheless, it created some degree of linking smallholder farmers to commercial credit. According to Bee (2007), the agricultural transformation approach was found to be very expensive as it relied

excessively on the use of machinery and large scale farming technologies that were largely financed by the government with donor support. On the other hand, the improvement approach succeeded in creating few capitalist farmers in some regions of the country like Arusha, Iringa, Shinyanga and Tabora. Besides, the improvement of smallholder farming through co-operative movements and to a large extent NDCA financing did not work well (Bee, 2007).

2.3.3.4 The Bank of Tanzania and agricultural credit

In 1964 Tanganyika united with Zanzibar to form the present United Republic of Tanzania. The process of establishment of Central Bank of Tanzania was facilitated with expert advice from Central Bank of German and later the IMF (Bee, 2007). Despite, the various initiatives by the government of providing credit for agriculture and rural development through commercial bank and specialized agency, the objective of improving agricultural production was not realized (Bee, 2007). In 1976, the Minister of Finance and Planning Hon. Amir. H. Jamal, constituted a committee on rural credit to advice the government on how the Central Bank and Commercial Banks can increase the pace of rural development through credit (BoT, 2006).

According to (BoT, 2006) the committee observed that the credit arrangement for agricultural did not provide adequate, effective and continuous co-ordination among the financial institutions and that the Central Bank was somewhat passive in development of the mechanism for domestic credit. Thus, the committee recommended the amendment to the Central Banks Act with the view of giving it more development role than that of regulating currency and credit (Bee, 2007). Consistent with the proposed role of the bank, the committee recommended the establishment of the Rural Finance Fund (RFF) under

the bank. The RFF was charged to perform functions which were limited to rural development.

The BoT Act of 1978, defined the role of the bank in the promotion of agriculture and rural development by establishing the RFF, through which the bank provided financial and non-financial services to public commercial banks namely, the National Bank of Commerce (NBC) and the Tanzania Rural Development Bank (TRDB) (BoT, 2006). The establishment of the TRDB was the result of (a) the failure of the NDCA to meet the credit needs of the smallholder farmers (b) excess loan default by NDCA hence threatening its viability (c) the need for banks that would mobilize the domestic resources (Bee, 2007).

2.3.3.5 The Tanzania Rural Development Bank and agricultural credit

The Tanzania Rural Development Bank (TRDB) was established in 1971 as a development bank to serve the agricultural sector of the country (BoT, 2006). This was a period when the Word Bank, which was the main financier of the agricultural transformation in many developing countries, was trying to develop and promote the Agricultural Bank Model in the developing countries (BoT, 2006). The need for the agricultural co-operatives bank comes from the assumption that there was a belief that without capital for investment there is no growth or development (Bee, 2007). This investment capital must be generated from locally mobilized savings as a work that can be done by the bank and hence the justification for the formation of specific agricultural bank (Bee, 2007).

2.3.3.6 Transformation of TRDB into Co-operative and Rural Development Bank

    (CRDB)

The Tanzania economy experienced a serious crisis towards the end of the 1970s and 1980s that called for the interventions (Bee, 2007). In its search for the appropriate agricultural and rural development strategy to address economic crisis, the government of Tanzania in 1980s constituted a Co-operative Review Commission (Bee *et al.*, 2001). The Commission was charged with exploring on how best the co-operatives can be reviewed in order to overcome the problem of agriculture and rural finance. Based on the report of the commission, the government enacted the Co-operative Society Act 1982, to provide for the re-establishment and registration of co-operative societies, which become effective in 1984 (Bee, 2007). In addition, two task forces were made to compliment the findings by main commission. The recommendation by the team led to the transformation of TRDB into Cooperative and Rural Development Bank (CRDB) in 1984 (BoT, 2006). Besides, the BoT explicitly formalized CRDB in 1984 as a commercial bank, which was hitherto considered as a development bank. The establishment of CRDB introduced some competition in financial sector, as it was to compete with NBC the sole commercial bank.

2.4 Types of Credits in Tanzania

2.4.1 Informal financial credit

Informal financial institutions operate without physical collateral, involving small loans and short term-transactions, and are characterized by adaptability and flexibility of operations in certain areas (Guirkinger, 2007). Among the characteristics of informal sector, no data on their activities are available through official statistical office (Matheswaram *et al*., 2001). Lower transaction costs provide a comparative advantage for informal financial institutions because of their small scale operations and specializations. Informal finance is based on mutual trust because it operates outside state control and

legal business regulations. The material collateral such as character, reputation, kinship, and family ties- plays an important role in borrowing from informal financial sources (Santos and Cuce, 2001).

Informal credit service represents a large informal capital markets to small farmers in rural areas and rural household continue borrowing and relaying on informal finances for their credit requirements. Based on the survey conducted in Philippine by Akram *et al*. (2008), about 76% borrowed from informal sources and these remained unchanged over the preceding 10 years (Santos and Cuce, 2001). The informal sector re-emerged in rural areas due to the failure of formal agricultural credit proggrammes. Informal agricultural credit is attractive in the rural areas since these are the only way to provide financial service to the rural household located in the remote areas and their loan record is better than many formal institutions (Rashid *et al*., 2004). Likewise, informal lenders accept payments in kind and they lend not only for production but also for consumption purposes (Rashid *et al*., 2004).

2.4.2 Formal financial credits

Formal financial institutions are organizations which are owned, controlled, licensed and registered by Governments (Poliquit, 2006). These include Commercial Banks, State owned Banks, Agricultural Development Banks, Rural Banks and Non Government organization offering credit services (Mohamed, 2003). Most of the Commercial banks are active in the urban centers, financing trade businesses while Agricultural Development Banks are usually situated in the rural areas serving mostly farmers (Poliquit, 2006). Based on the study done in Philippine by Akram (2008), the number of loans from formal financial institutions in developing countries accessed by small farmers is low. The reasons for such low availment include complicated and lengthy loans

procedures that often overwhelm the poor and uneducated farmer borrowers. Also, obtaining loans from formal institutions overburdened the small farmers in terms of slow release of funds and higher transaction costs, which may lead them to borrow from informal financial institutions (Zumbika, 2010). Moreover, some restrictive features of loans also affect them. These are like security requirements as the borrowers do not have assets to support their credits (Meyer *et al.,* 2004).

2.4.2.1 Formal institutions and lending procedures

Access to financial services by smallholders is normally seen as one of the constraints limiting their benefits from credit facilities (Diagne *et al*., 2001). However, in most cases the access problem, especially among formal financial institutions, is one created by the institutions mainly through their lending policies (Kadidia, 2001). This is manifested in the form of prescribed minimum loan amounts, complicated application procedures and restrictions on credit for specific purposes (Yehuala, 2008). For small-scale enterprises, reliable access to short-term and small amounts of credit is more valuable, and emphasizing as it may be more appropriate in credit programmes aimed at such enterprises.

Zeller *et al*. (2002) claimed that the type of financial institution and its policy will often determine the access. Where credit duration, terms of payment, required security and the provisions of supplementary services do not fit the needs of the target group, potential borrowers will not apply for credit even where it exists and when they do, they will be denied access. In addition, Bigsten *et al*. (2003), claimed that in developing countries asymmetric information, high risks, lack of collateral, lender-borrower distance, small and frequent credit transactions of rural households make real costs of borrowing vary among different sources of credit.

A study by Atieno (2001) indicates that income level, distance to credit sources, past credit participation and assets owned were significant variables that explain the participation in formal credit markets. Hussien (2007) also indicated that farm households are more likely to prefer the informal sector to the formal sector with respect to flexibility in rescheduling loan repayments in times of unexpected income shocks. This was also supported by Atieno (2001), comparing the informal credit sector from the formal stated that proximity, comfortable atmosphere, quick credit, all times access, freedom of deployment, repayment flexibility and lower transaction costs are the advantages of the informal sector that have made them almost indispensable, particularly to small farmers.

According to Yehuala (2008), conditions imposed by formal credit institutions like collateral requirements should not actually stand in the way of smallholders and the poor in obtaining credit. The poor can use the loans and repay if effective procedures for disbursement, supervision and repayment have been established. On the other hand, Getaneh (2005), stated that group lending approach effectively ration out some groups of farm households (The poorest of the poor). That is co-borrowers tend to self select themselves into a group of homogenous members that effectively discriminate against some others to reduce risk of carrying the burden of repayment incase of defaults of co-borrowers (Manganhele, 2010).

2.4.2.2 Group lending

Currently, there is an increasing emphasis made to adopt group lending (Sharma *et al.*, 2004). This is the method to extend agricultural credit to small organizations rather than to individuals. Some analysts believe that joint liability (group responsibility) in group lending imposes group pressure to repay loans (Amandriz and Gollier, 2000). It is also argued that group lending reduces overhead costs, expedites the supply of seasonal inputs,

improves credit institution-client communication and facilitates monitoring of repayment (Sharma *et al.*, 2004).

2.4.2.3 Savings mobilization and agricultural credit

Conventional approaches to agricultural credit have often overlooked the importance of savings mobilization, which is the other half of financial intermediation (ICA, 2001) many government-sponsored agricultural and development credit institutions provide no deposit service (ICA, 2001). In the past, policy-makers did not believe that the rural poor could save and only in recent years there has been growing awareness that deposit mobilization must receive priority and be considered as an integral part of financial building (ILO, 2002; Atieno, 2001). Saving mobilization not only contributes to domestic resources mobilization and to equitable income distribution but it also facilitates credit appraisal and loan recovery (Chambo *et al.*, 2003). Balanced/loan approaches, where properly implemented, have led to a sustained high repayment level since lenders are more careful in extending loans and recovering them if savings by neighbors and friends as well as their own are involved (ICA, 2001).

2.4.2.4 Smallholder farmers characteristics and formal credits

Access to formal credit can also be affected by household characteristics (Khalid and Temu, 2009). As stated by Hussien (2007), the probability of choosing the formal credit sector was positively affected by gender, educational level, household labour and farm size. Hussien (2007) further explained that education, credit information and extension visit are more likely to increase the information base and decision making abilities of the farm households including the ability to compare pros and cons of choosing appropriate credit and production technology.

Physical distance of farm households from formal lending institutions is one of the factors that influence access to formal credit. According to Hussien (2007), farm households are discouraged to borrow from credit sector if it is located farther. This is because both temporal and monetary costs of transaction, especially transportation cost, increase with lender-borrower distance which raises the effective cost of borrowing at otherwise relatively lower interest rate in the sector (Khalid and Temu, 2009).

In another study, based on the data from a sample survey of 699 randomly selected peasant farmers in Philippine Llanto (2005), applied discriminate analysis to identify a set of socio-economic, physical and psychological factors that influence credit use among small farmers with a view to differentiate between borrowers, and non-borrowers. Results of the study indicated that borrowers were characterized by higher resource base, farm size, higher level of education, large number of cattle, higher household incomes, higher level of market integration, greater use of improved technology, larger operating costs and investments, higher risk ability. Non-borrowers were characterized by lack of interest to expand production, lower level of education, limited use of improved technology, shortage of labour and proximity to market (Llanto, 2005).

2.4.2.5 Credit default and repayment performance

The literature on factors influencing loan repayment performance among financial institutions targeting the poor is very sparse and limited mainly to microfinance experience in low income countries (Derban *et al*., 2005; Silwal, 2003). Mohd (2010) argued that factors affecting repayment performance of MFIs can be divided into four factors, namely; individual/borrowers factors, firm factors, loan factors and institutional/lender factors. Several studies (Derban *et al*. 2005; Hoque, 2000; Colye, 2000) show that when a loan is not repaid, it may be a result of the

borrowers' unwillingness and/or inability to repay. Stiglitz (2002) recommend that the banks should screen the borrowers and select the "good" borrowers from the "bad" borrowers and monitor the borrowers to make sure that they use the loans for the intended purpose.

Godquin (2004) claimed that the provision of non-financial services such as training, basic literacy and health services has a positive impact on repayment performance. Roslan and Mohd Zaini (2009) found that borrowers that did not have any training in relation to their business have a higher probability to default. Tedeschi (2006) noted that there are two possible reasons for default: strategic default or default due to a negative economic shock. The lending contract provides incentives to discourage strategic default, but default due to an economic shock is unavoidable. In contrast, Derban *et al*. (2005) argued that the important factors that contribute to loan repayment performance are the design features of the loan. They categorize the design features into three categories, namely; access methods, screening methods and incentive to repay. Access methods generally ensure that poor people access the loans not the richer people and the features include maximum loan ceilings and high interest rate. Screening methods are used to screen out bad borrowers.

However, Mohd (2010) argues that, "it is the lender not the borrower, who causes or prevents high levels of delinquency in credit programs. While, Awoke (2004), reports that most of the default arose from poor implementation and management procedures, loan diversion and unwillingness to repay loans. Therefore, the lenders must devise various institutional mechanisms that aimed to reduce the risk of loan default.

2.5 Small Enterprise Development Agency

2.5.1 Institution background

SEDA is the microfinance institution (MFI) which was established by world vision Tanzania (WVT) as a charitable trust in 1996. World vision is a Christian relief and development organization. SEDA first evolved as a pilot project within the world vision Tanzania in 1995 and a year later, was registered under the trustees Ordinance with an independent board of trustees. Since its establishment, SEDA has grown in terms of geographical coverage and client base. SEDA is now organized as one of the leading microfinance service providers in Tanzania.

2.5.2 The institution mission and vision

2.5.2.1 The institution mission

To be a microfinance provider of choice through the provision of quality products and services to individual and communities to foster sustainable livelihood among them.

2.5.2.2 The institution vision

A society where people are empowered to realize their potential and to experience life in all its fullness.

2.5.3 The institution objective

The main objective of the institution is to reach out a large number of economically active poor, thus enabling them to engage effectively in economic activities so as to increase their household income for better resilience. Among the economically active poor are the smallholder farmers who primarily depend on small-scale farming systems as the primary source of their livelihoods. Smallholder farmers are marginalized group, vulnerable to climatic and economic shocks who often do not produce enough to enable their families to have sufficient food to eat throughout the year.

2.5.4 The institution organization structure

SEDA has a board of trustees which provides the oversight and guidance to management. The role of the board of trustees is to guide the institution in fulfilling its mission-vision, to protect the institutions assets, and to protect the interests of world vision. The board is structured into committees to oversee specific functions within the institution. The other department within the institution is Executive Director/ Chief Executive Officer (ED/CEO) who is responsible in implementing the strategic goals and objective of the institution (SEDA) and for giving direction and leadership towards the achievement of SEDA's vision, mission and goals. The institution has five departments under the executive director, namely department of operations under the supervision of the Director of Operations (DO), finance and administration under supervision of the Director of Finance and administration (DFA), human resource under supervision of human resource manager (HRM), Management Information System (MIS) under supervision of MIS manager and internal audit department which reports to the audit committee but administratively reports to the Executive Director.

2.5.5 The farmers credit support

2.5.5.1 The saving and credit unit

The rationale for establishing the saving and credit unit as the supporting structure to the rural farmers was based on the gap created by the ongoing reform programmes which are based on liberalization and privatization, both in commercial banking and co-operatives sector. As a result farmer's access to credit is constrained by stringent collateral requirements posed by emerging financial institutions.

2.5.5.2 Group formation and saving mobilization

The objective of this section is to enable the smallholder farmers to form groups and to pool their meager resources to attain both effectiveness and efficiency in production. It was also believed that in such groups farmers would discuss and resolve commonly encountered problems. The rationale to saving mobilization is to introduce among rural farmer's communities the habit of saving on a regular basis.

2.6 Types of SEDA Credits and Credit Management

2.6.1 Types of credit/products

Currently the institution (SEDA) is offering four types of credit/products to the entrepreneurs of different types. These groups are as follows; *Biashara* loan, which is designed for providing credit services to micro-entrepreneurs who organize themselves in a group of 6-25 members. *Jiendeleze* loan product, this is the product which has been designed for the clients who own and operate medium size businesses. The loan is provided to solidarity groups of 3 to 5 members. *Kitita* loan, this product has been designed for mature clients who would like to get bigger loan size without necessarily being in a group. *Mkombozi* loan (agricultural loan), this is the product which has been designed for smallholder farmers who are running small farm businesses. Only *Kitita* loan served under individual client basis, while the rest *Jiendeleze*, *Biashara* and *Mkombozi* loan are served under group lending methodology which was developed from indigenous rotating saving and credit associations (ROSCA), a financial system in Tanzania known as *kitita*. This study, however, focuses only on the *Mkombozi* loan (agricultural loan).

2.6.2 Credit management

The credit management is under the close supervision of the branch manager (BM) who works together with the branch Accounting officer and the assigned credit officer (CO).

The branch manager reports to the zonal manager who is the principal advisor of the director of operations (DO) on all matters relating to the operations of all branches under his supervision.

2.7 Terms and Conditions of Loans

2.7.1 Eligibility

To qualify for agricultural loan from SEDA, the beneficiary must be a farmer that produces surplus for the business or doing a legal business that confirms SEDA core values for a period of not less than one year. Beneficiaries must come from one village and constitute a group of 10 to 25 members. Beneficiaries must be old enough to make decision on their own, manage their own farm business and every member should be willing to co-guarantee each other.

2.7.2 Collateral and interest rate

SEDA established three types of collateral for all agricultural/mkombozi loans. These are tangible assets, social collateral (group guarantees), monthly saving and ten percent (cash collateral). In absence of any tangible assets, group guarantees is acceptable as collateral for agricultural loan. On monthly saving basis, each client of *mkombozi* loan is required to deposit a sum TZS 3000 into the group bank account every month. This amount shall be withdrawn from the group's bank account as a final resort when all other collateral have been inadequate to pay for the remaining balance of the loan. Basing on cash collateral (10%), every client of mkombozi loan is required to deposit ten percent of his/her approved loan size into SEDA᾿s account prior to receiving the loan. The interest rate for the mkombozi loan is 18% per annum. This rate was adopted on the consideration of inflation rate.

2.7.3 Loan structure and repayment

All loans are supposed to be supported by the properly designed and signed agreements. A loan agreement entered between SEDA and its clients is contract enforceable by law. A loan agreement was only prepared after a loan is approved, acceptable security/collaterals had been identified. Loan repayment is an essential component at the institution set-up. The maximum credit period is 10 months, where a borrower can pay once in lump sum at the end of the loan term or make prepayments in which it is encouraged in this loan product.

2.7.4 Supervision and follow-up

Loan supervision and follow-up are carried out to ensure timely repayments of the loans; be satisfied that the project is implemented according to the appraisal report, make sure that all parts of the loan agreement are being strictly adhered to and to assist the borrowers in terms of advice on solutions for any unforeseen problems pertaining the loan and the right course of implementation.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Description of the Study Area

This study was conducted in Dodoma Municipality and Bahi District in Dodoma Region. The reason of selecting these districts was that there were many smallholder farmers who were borrowers from SEDA credit scheme in Dodoma branch. The two districts differ in terms geographical location and nature of off-farm activities conducted within the districts contributing to demand of agricultural credit.

3.1.1 Dodoma Municipality

3.1.1.1 Geographical location and size

Dodoma Municipality lies between latitudes of 6.0 degrees and 6.30 degrees to the South of equator and between longitude of 35.30 degrees and 36.02 degrees to the East of Greenwich. The district covers an area of 2 769 square km. Dodoma Municipality District is centrally positioned in the country and is bordered by Chamwino District to the east, Bahi District to the west and Iringa Region in the South. Dodoma Municipality stands on broad upland plateau with an altitude ranging between 900-1000 meters above sea level, with beautiful stony hills such as Image, Isanga, Mkalama and Mlimwa. The municipality experiences a long draught and short rainfall seasons. Due to unreliable rainfall, the area has scanty vegetation such as shrubs, grasses as well as conspicuous baobab and acacias trees (DMC, 2010).

3.1.1.2 Population size and administrative unit

According to the population and housing census of 2012, Dodoma Municipality had a total population of 410 956 people of which male were 199 487 and females were

211 469 with the annual population growth rate of 2.8%. Dodoma Municipality is administratively divided into one parliamentary constituency, 4 divisions, 37 wards, 39 villages, 100 *mitaa* and 222 hamlets. The government has established administrative units with the expectation of promoting economic activities and development of the district through the practices of good governance (DMC, 2010).

3.1.1.3 Dodoma Municipality climatic conditions

The climate of Dodoma Municipality is semi-arid, characterized by a marked seasonal rainfall distribution with a long dry and short wet seasons with an average annual rainfall of about 550 – 600 mm per year, which falls between December and April each year. The Municipality has moderate drainage soils with Savannah type of vegetation mainly dominated by *Baobab* trees and *Acacia* wood lands. The average temperature varies from 20^0C in July to 30^0C in November each year. There are seasonal rivers, deep and shallow wells including dams in few villages.

3.1.1.4 Dodoma Municipality economy

The municipality is almost entirely dependent on agriculture and livestock production, which are locally practiced, largely at household level. About 75% of people's income in the district is from agriculture and animal husbandry. The remaining 25% of the population is engaged in petty businesses such as retail shops, carpentry and food vendors (DMC, 2010). There is small-scale processing of agricultural and livestock products. Agriculture is characterized by low productivity resulting from low and erratic rainfall, high evapo-transpiration and low moisture holding capacity (DMC, 2010). These conditions compounded by poor farming practice and overstocking /overgrazing makes the district susceptible to extensive soil erosion. The main staple crops grown in the district include sorghum, bulrush millet, cassava and maize, while the major cash

crops are groundnuts, sunflower, simsim, grapes and to a lesser extent pigeon peas. Livestock is the second contributor to the district economy (DMC, 2010). The livestock kept by small farmer include cattle, goats, sheep, local chicken, ducks, donkeys and pigs.

Natural resources, which include forestry, wildlife, beekeeping, fishing and mining, are other sectors which people are engaged in for their livelihood. Products such as timber, logs, poles, wildlife, honey beeswax, fish, salt and gold are locally harvested. However, the sector contribution to the economy of the district is minimal because of poor technological capacities. The industrial sector is yet to take shape, apart from a few small scale processing industries such as oil extraction, carpentry, pottery, blacksmith, wood caving, whose operation are mostly confined to urban trading centers (DMC, 2010).

3.1.2 Bahi District

3.1.2.1 Geographical location and size of Bahi district

Bahi District is one of the six district of Dodoma Region. The headquarters of the district is located in Bahi Ward which is 50 km away from Dodoma Municipality. Bahi District extends between latitudes 4^0 degrees and 8^0 degrees South and between longitude 35^0 degrees and 37^0 degrees East. The district covers an area of 544 842 ha, which is 13% of Dodoma Region. The district is boardered with Chamwiono Distri ct and Dodoma Municipality on the east, Kondoa District on the north, Iringa Region on the southwest and Manyoni District in Singida Region on the west.

3.1.2.2 Population size and administrative unit of Bahi district

According to the population and housing census of 2012, Bahi District had a total population of 203 216 people of which male were 95 842 and females were107 374 with the annual population growth rate of 1.6% with the population density of 36 people per

square kilometers. Bahi District has been divided into four divisions namely; Mundemu, Chipanga, Mwitikira and Bahi with 20 wards. The administrative units have been established with expectation of keeping peace and order and facilitate the overall development of the district through exercising good governance.

3.1.2.3 Climatic conditions of Bahi district

Most parts of Bahi District are semi-arid characterized by low and erratic rainfall. The district experiences one rain season between November and April. The rainfall duration is usually very short and sometimes characterized with short period of heavy storms leading to floods. The average rainfall ranges from 500 mm to 650 mm per annum. The rain season is then followed by the long dry season between April to the beginning of November, characterized by dry winds and low humid that leads to higher evapo-transipiration. Due to short rainfall duration, heavy water runoff and hence poor infiltration is common in the district leading to less moisture reserve in the soil.

Bahi District experiences both high and low temperature. The highest temperature is 31^0C while the lowest temperature is 18^0C. The cool dry season begins in June and always ends up early in September. Absence of clouds cover lowers the temperature in the night but also raise the day light temperature. The vegetation of Bahi District is characterized by bush and thickets and scattered trees in some areas. The vegetation cover has been reduced by human activities such as agriculture, lumbering, fuel wood and charcoal extraction and grazing.

3.1.2.4 Bahi district economy

Agriculture sector: About 80% of Bahi District economy comes from crop production sector. The sector is managed by smallholder farmers who do not use improved farming

technology and depend on rain fed farming. As a result yield per acre is relatively low. The district cultivate groundnuts, sunflower, simsim and paddy as the cash crops while maize, sorghum, bulrush millet are cultivated as the food crops. The main challenges facing farming in the district are low income by smallholder farmers who can not afford to buy and use fertilizers, agrochemicals and improved seeds. Unavailability and high price of inputs have tremendously impacted agricultural production in the district. Other challenges are the marketing structure for the farmer's produces were fragmented and poorly developed, low prices, price fluctuation and lack of market information (BDC, 2010).

Livestock keeping: Apart from crop production, livestock keeping also contributes significantly to the district economy. Most of the livestock which are kept are traditional cattle breed, sheep and goats. Based on the survey conducted in June 2008; the district was estimated to have 28% of its population keeping cattle, 37% keeping goats, 19% keeping sheeps and 78% keeping local chicken. In addition, the survey revealed that less than 10% of the total population kept donkeys and pigs.

Fisheries sector: Fishing in Bahi District is mainly done seasonally. Yet the sector has notable contribution to the individual income and the district as a whole. The main rivers for fishing in the district include river Bubu, Lukali, Kasela and Mkambala. In few cases fishing is conducted throughout the year in areas with permanent swamps. Fish species which are found in the district are claris (Kambale), tilapia (perege), ningu and sardine (dagaa) whereas the main tools used in fishing are fishnet, fishtrap, and hooklines (BDC, 2010).

Forestry sector*:* Bahi District is also endowed with forestry resources. A good number of people in the district depend on trading forestry products as one of their important livelihood strategies. Furthermore, a significant proportion of charcoal and firewood supply to Dodoma Municipality is from Bahi District. According to the district report 2008, forestry products harvested in the district since the year 2002 have been increasing with no signs of having the trend of declining. This implies that the pressure of forestry harvesting is increasing and hence efforts need to be put in place to counteract the prevailing situation. Most of the tree planting efforts in the district have been initiated by Non Governmental Organizations which exist in the district such as Word Vision Tanzania and Dodoma Environmental Network (BDC, 2010).

Bee-Keeping: Bee-keeping though is carried out in small scale is another source of district and individual income. Bee-keeping in the district is to a large extent (more than 99%) being carried out traditionally. Bee species found in Bahi include stinging bee (*Apis mellifera steculata*) and stingless bee (*Mellipona spp. and Trigona spp*).

Mining sector: Mining sector in the district is still in the infant stage. Currently, what exists in the district is small scale salt, phosphate and gold mining carried out by local people using traditional methods. Several local people are engaged in salt mining for local use and export to other districts/regions in the country. Uranium is still in exploration in Bahi and Mpamantwa Wards (BDC, 2010).

3.2 The Conceptual Framework

The conceptual framework employed in this study was based on the argument that, the lending procedures and policies vary across credit sources and the fact that lenders operate independently and potential borrowers are not well-informed about the operations

of various financial institutions. This is manifested in the form of prescribed minimum loan amounts, complicated application procedures and restrictions on credit for specific purposes (Diagne *et al*., 2001). Lending procedures and polices employed by the credit providers include the use of assets to secure loans, credit worthiness of the recipient, mode of repayment, volume of the business, business licensing, application and registration fees, and capital base on the lender. The variations in lending practices are mainly attributed to differences in characteristics of the credit recipients and those of the credit providers. Borrowers' characteristics such as age, gender, marital status, wealth status, education, economic activities, and household size are hypothesized to have strong influence on the amount of credit demanded (Awoke, 2004). These lending conditions are assumed to be the major concerns for the borrowers' choice of the credit source as shown in Fig. 2.

SUPPLIER OF FINANCIAL SERVICE
-Formal institutional factors affecting
Credit rationing

CREDIT DEMAND FACTORS
-Individual characteristics
-Household Assets

CONTEXTUAL FACTORS
1. **Fiancial sector policies and legal environment**
   -interest rates
   -appropriate collaterals
   -ability to make savings
2. **Financial sector regulations and supervision**
3. Economic and Policy
   -reasonable distance
   -proper group formation

Smallholder Farmer

Smallholder Farmers increase
-more income
-Expansion of agricultural enterprises
Smallholder Farmers increase
-Production
-income

Poverty reduction

Figure 2: The conceptual framework

According to the conceptual framework, in order for these credit sources to reach the majority of the smallholder farmers, there is need to smoothen information and capital flow because high dependence on credit and low capacity for individuals to make any meaningful savings for investment have been a major problem for the poor clients (Themba *et al*., 1999). Therefore credit services have the potential to increase production on farm enterprises.

3.3 Research Design

This study employed a cross sectional design. This is a kind of design where data were collected at a single point of time from a sample to represent a large population. The design is suitable in descriptive study and for determination of relationship between and among variables. It is also economical in terms of time and financial resources.

3.4 Sampling Procedure

Two districts were purposefully selected based on the presence of smallholder farmers who were credit borrowers from SEDA credit scheme. These districts were Dodoma Municipality and Bahi District, where there were 965 and 436 smallholder farmers who were clients from SEDA respectively. Purposive and Stratified random sampling was used to obtain100 respondents who were credit borrowers and 100 respondents who are non-credit borrowers in areas (wards and villages) with high number of clients in both districts. A total of 200 respondents were used for this study as stated by Sudman (1976) that a minimum of 100 respondents is enough for each group when comparative study is conducted.

3.5 Data Sources

3.5.1 Primary data collection

Primary data were collected using structured questionnaires as a main tool, composed of closed ended questions where by respondents were given alternative answers and open ended questions where by respondents were required to give their views. The questionnaires were filled with the aid of enumerators and they were designed to capture both qualitative and quantitative data.

3.5.2 Secondary data

Secondary data to support the findings of this study were collected from SEDA office in Dodoma branch, Sokoine National Agricultural Library (SNAL), Dodoma municipality and Bahi District offices, books and internet**.**

3.6 Data Analysis

3.6.1 Binary logistic regression model

Binary logistic model was used in this study to determine the socio-economic factors that influence credit demand by smallholder farmers in Dodoma Municipality and Bahi District responding to the first objective of this study.

3.6.2 Empirical model specification

This study adopted a demand definition by Udoh *et al*. (2005) which refers to the willingness and ability of a farmer to access existing source of funds to meet farm investment needs. The dependent variable in this case is dichotomous (binary choice that they have applied or not applied for loan). According to Brooks (2008) logit is the non linear model and is estimated using Maximum likelihood (ML) method. In addition, Menard (2002) noted that logit regression model guarantee that the estimate probabilities

lie between 0 and 1. Due to this advantage logit model is mostly frequently used when the

dependent variable happen to be dichotomous (Gujarat, 2004).

The empirical logistic regression model is specified in equation (1)

$Ln(P/1-P)= \alpha +\beta_1x_1+\beta_2x_2+\beta_3x_3+ \beta_4x_4+\beta_5x_5+\beta_6x_6+\beta_7x_7+\beta_8x_8 +\mu$…………….……….........(1)

Where

Ln (p/1-p) is the probability to borrow (P) divided by the probability not to   borrow

(1-P) of the ith observations (smallholder farmers).

A   Constant

β_{1-8} Parameters estimated

x_{1-8} Independent variables

μ   Disturbance term

Assumptions

   i.   Logistic regression does not assume a linear relationship between the dependent

        and independent variables.

   ii. The dependent variable must be a dichotomy (2 categories).

   iii. The independent variables need not be interval, nor normally distributed, nor

        linearly related, nor of equal variance within each group.

Table 1: Variables of the Binary Logit Regressions Model

Variables	Description	Type	Values
Dependent variable			
DEMAND	Applied/not applied	Categorical	(0,1)
Independent Variables			
AGE	Age of household head	Categorized	18-35=1, 35-55=2, 56 and above=3
GENDER	Gender of the household head	Dummy	0= female, 1= male
LBCOST	Average hired labour cost	continuous	Amount in TZS
EDULEV	Education level of household	Continuous	Years to school
EXCONTA	Access to extension service	Continuous	Number of contacts in a year
FARMSIZE	Farm size by the household	Continuous	Acreage (Ha)
HHSIZE	Household size	Categorized	2-5=1, 6 and above=2
INFORMATN	Awareness about SEDA	Categorized	1= Aware, 0= Otherwise

3.6.3 Regression analysis

The regression model has been used to test the hypothesis that; *Smallholder farmer's socio-economic characteristics have no influence on demand for agricultural credit* and will be as follows.

$$Y_i = Z_o + Z_1x_1 + Z_2X_2 + Z_3X_3 + U_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

Where by:

Y = value of dependent variable

Z_O = constant term

Z_i = independent variable coefficients

X_i = independent variable

U_i = Random error

i = ith observation

The dependent variable Y is the amount of the seasonal loan obtained by a farmer from SEDA in (TZS).

Table 2: Variables of the Multiple Linear Regressions Model

Variables	Description	Type	Values
Dependent variable			
LOAN SIZE	Amount of loan received	Continuous	TZS
Independent variable			
AGE	Age of household head	Categorical	18-35=1, 35-55=2, 56 and above=3
EXPSEDA	Experience use SEDA credit	continuous	Number of years
GUARANTOR	Number of group members	continuous	Man equivalent
MULTLOAN	Amount of loan from other sources	Continuous	TZS
DISTANCE	Farmers distance from SEDA office	Continuous	Number of hours spent
LATEPAYMENT	Amount in arrears	Continuous	TZS
SAVINGS	Amount deposited in saving account	Continuous	TZS
AOINCM	Average income from off farm activities	Continuous	TZS
COLLATERALS	Approximate value of asset owned by a farmer	Continuous	TZS

3.6.4 Explanatory variables of the regression model

Among a number of factors, which have been related to smallholder farmers' access to credit, in this study, the following socio-economic, factors were hypothesized to explain the dependent variable.

(i) **Age of the farm household head (AGE):** It is a categorical variable. Those farmers having a higher age due to life experience will have much better association with cooperatives and other formal credit institutions, and it was hypothesized that farmers with higher age may have more access to use credit from the formal sources.

(ii) **Average off-farm income (AOINC):** With increased level of income from off-farm activities, a farmer builds up confidence to borrow. Because cash obtained from off-farm activities could be used by a farmer in periods of low crops produce and low income from sales of low crop produce to repay the loan. Off-farm income infact raise the equity ratio and hence capability to repay the loan.

(iii) **Gender of respondents (GENDER)**: This is a dummy variable that assumes a value of "1" if the head of the household is male and "0" otherwise. According to Matheswaram *et al*. (2001) "there are two major factors which restrict women's access to formal credit more than men's. These are related to women's lack of control over economic resources and the nature of their economic activity". With this background including the existing gender differences; male headed households have mobility, participate in different meetings and have more exposure to information; therefore it was hypothesized that male headed households have more access to use formal credit.

(iv) Farming experience (FARMEXP): This refers to the number of years the household head uses in farming business. Farmers having more experience in farming business have higher tendency towards using available sources so as to increase their farm outputs. Therefore, a farmer having more experience in farming business will have higher tendency towards using the formal credit sources and vice versa. Hence, this variable is assumed to have positive influence on the dependent variable.

(v) Years of schooling HH head (EDUCLEV): This refers to the number of years a household head spent in school. Better education is assumed to improve access to credit. Farmers who can read and write are expected to have more exposure to the external environment and accumulate knowledge. They have the ability to analyze costs and benefits. The more educated the household head the more credit he will use for consumption purposes. According to Hussein (2007), as the household gets more formal education, the probability of obtaining credit increases. Therefore, it was expected that those farmers who can read and write have better credit requirement that leads to access to use formal credit sources.

(**vi) Household size (HHSIZE):** This refers to the total number of family members of the household who are potential to work on the farm, and it is measured in man equivalent. The larger the number of family labour, the more the labour force available for production purpose. The more the labour force available, the lower the demand for hired labour. This means that there will be no or low cost for hired labour. If demand for hired labour decreases due to availability of family labour, the need for credit decreases. Therefore, family labour was hypothesized to have negative impact on access to credit.

(vii) Extension contact (EXECON): This refers to the number of contacts with extension officers/agents that the respondent made in a year. Farmers who have a frequent contact with extension agents are expected to have more information that will influence farm household's demand for credit. Therefore, it was hypothesized that this variable positively influences farmer's access to use formal credit.

(viii) When informed about SEDA (INFORM): This refers to the number of years the smallholder farmer get informed about SEDA credit scheme. A farmer having more information about a formal credit scheme has higher awareness and tendency towards using the formal credit sources and the vice versa. Hence, this variable is assumed to have positive influence on the dependent variable.

(ix) Farm size in hectare (FARMSIZE): It is the total land size cultivated (it is the sum of owned cultivated land, rented-in land and land secured through sharecropping arrangements) by the household. It is a continuous variable. The larger the cultivated land size the more the labour required that demands additional capital that might be obtained through credit. The main hypothesis was that the farmer who cultivates larger size of land can utilize more capital and will demand for credit and therefore he/she will be more accessed to credit from the formal sources.

(x) Total livestock ownership (LIVESTOCK): This refers to the total number of animals possessed by the household. Livestock is considered as another asset which is liquid and a security against crop failure. As the total number of animals in the household increases, the household would be less likely to go for credit. This can be attributed to increase wealth and income base of farm households which makes more money available

in the households that minimizes demand for credit. Hence this variable was assumed to have both positive and negative influence on the dependent variable.

(xi) Average hired labour cost (LBCOST): With increased level of hired labour cost a farmer demand more credit for financing different farm activities performed by hired labour.

(xii) Experience in credit use: (EXPSEDA): This refers to the number of years the household head uses credit from formal financial institutions. A farmer having more experience in formal credit use will have higher tendency towards using the formal credit sources and vice versa. Hence, this variable is assumed to have positive influence on the dependent variable.

(xiii) Group membership (GUARANTOR): Smallholder farmers are expected to form a group (that can serve as collateral) to take credit from the formal credit sources. Therefore, it was expected that farmers who are willing to form groups will be given higher loan amount, but those who are unable to form a group or deprived of membership by the group were not able to use formal credit.

(xiv) Physical distance of farmers from lending institutions (DINST): Farmers near the lending institutions have a location advantage and can contact the lender easily and have more access to information than those who live more distant locations. Therefore, location advantage was expected to increase access to use credit from the formal institutions.

(xv) Farmers' late repayment period (LATEPAYMENT): Formal credit institutions have rules and regulations that limits the time at which the borrower should repay the loan. If farmers fail to repay on time they will be sent to the court or their property may be confiscated. Due to this reason farmers fear taking bigger loans from formal credit sources.

3.6.5 Descriptive statistics

Descriptive statistics such as frequencies and percentages which was used to assess the performance of SEDA agricultural loan and determining the extent of credit rationing responding to the second and third objectives.

3.6.4 Difference in difference analysis

The difference in difference analysis was used to assess the contribution of SEDA agricultural credit to farmer's income in Dodoma Municipality and Bahi District responding to the firth objective. In addition, income of the non-borrower farmer's were used as the control group during DID analysis.

Table 3: Variables used in Difference In Difference analysis

	Before change	After change	variance
Group 1 (Treat)	Yt_1	Yt_2	$\Delta Yt = Yt_1 - Yt_2$
Group 2 (Control)	YC_1	YC_2	$\Delta Yc = YC_1 - YC_2$
variance			$\Delta\Delta Y = (Yt_1 - Yt_2) - (YC_1 - YC_2)$

Note:
Yt_1 = Average borrowers income before credit use
Yt_2 = Average borrowers income after credit use
ΔYt = Change in borrowers income
Yc_1 = Average non borrowers farmers income before change
Yc_2 = Average non borrowers income after change
ΔYc = change in non borrowers income

3.6.6 T-test

An in dependent sample T-test was used to compare the performance between borrowers and non- borrowers. Comparison was made on the contribution of agricultural credit to household farm revenue/income responding to the fourth objective and testing the hypothesis that: "there is no significant difference in performance between smallholder farmers with and without credit".

$$T = \frac{X_1 - X_2}{\sqrt{S_1^2/N_1 + S_2^2/N_2}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3)$$

Whereas,

X_1 and X_2 are sample means of alternative groups

S_1^2 and S_2^2 are sample variances for the two groups

N_1 and N_2 are sample sizes for the compared groups

Assumptions

  i.   Each group is considered to be a sample from a distinct population

 ii.   The responses in each group are independent of those in the other group

iii.   The distributions of the variable of interest are normal

3.7 Limitation of the Study

This study was limited by time and financial constraints. Given the above constraints, the scope of the study was limited to one region, two districts, four villages and a sample of 200 farmers was used. Ideally more regions under SEDA and few more districts would have generated more conclusive results. Furthermore, there would have been added advantages in using data collection over the period before and after the implementation of the SEDA operations. However, it is the contention of the author that suggestions and

recommendations emanating from the study applies to other regions under SEDA credit scheme, and will be viewed seriously by SEDA management, funding agencies, and policy planers. Data collection also had some problems. Most of the respondents did not keep records. Thus, the accuracy of data collected dependent much on the individual capacity to recall.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Respondents' Socio-economic Characteristics in Dodoma Municipality and Bahi District

The characteristics of given the respondents have important socio and economic implication to the accessibility, participation and decision making to the overall household production process whereby, the composition of the household usually influences the decision making process (Kadigi, 2012). This section describes the characteristics of the sampled household based on age, gender, marital status, education level, household size, land possession (both owned and hired) and livestock keeping in relation to demand and use of agricultural credit.

4.1.1 Age of respondents

With respect to age, the findings showed that 28% and 36% of the borrower farmers were below 35 years old, while 66% and 52% were between 36 and 55 years in Dodoma Municipality and Bahi District respectively (Table 4). This implies that, the majority of respondents in Dodoma Municipality were mature people within the active working age group, and so can take family responsibilities. Kamara *et al*. (2004) urges that in total the accumulation of wealthy is highly dependent on age of an individual where-by a direct relationship is experienced. Likewise, age is an indication/proxy for the individual maturity and ability to make rational decision on agricultural production (Godquin, 2004).

4.1.2 Household size

The household composition considered in this study are the residential groups whose members line together in close contacts by sharing resources held in common, such as accommodation and food. Therefore the findings show that, 62% and 56% of the borrower's households in Dodoma Municipality and Bahi District respectively consist of 2 to 5 family members (Table 4). According to the Tanzania Household Budget Survey of 2000/01, the average household size of Tanzania mainland was five members. However, 38% and 44% of the sampled farmer's families in both district reported the average household size of 6 and above family members (Table 4).This might be influenced by African culture that, most families are extended (Roslan and Mohd, 2009). The bigger the household size, the less it's access to credit use (Khali and Temu, 2009). This implies that only 38% and 44% of the borrower farmers in Dodoma Municipality and Bahi District respectively , had a less access to credit from SEDA credit scheme due to their bigger household size of 6 and above family members.

4.1.3 Gender of respondents

Gender has implications on roles and responsibilities in the society, and therefore has a good link with household income. With regard to borrowers the sample was composed of 64% male-borrowers and 36% female-borrowers in Dodoma Municipality while in Bahi District the composition was 54% male-borrowers and 46% female-borrowers (Table 4). Matheswaram *et al*. (2001) stated that "there are two major factors which restrict women's access to formal credit more than men's. These are related to women's lack of control over economic resources and the nature of their economic activity". With this background including the existing gender differences; male-borrowers have mobility, participate in different meetings and have more exposure to economic and production information.

4.1.4 Marital status of the respondents

The findings show that only 8% and 10% of the farmers in Dodoma Municipality and Bahi District were single whereas, 86% and 80% were married in both districts respectively (Table 4). The observed difference may be due to the fact that most of people start to take agricultural activities as their own business as household size increase so as to increase their household income. Kadigi (2012) argued that married men being attached with family obligations engage in production activities in order to generate cash income to meet family needs as well as expanding their household income base. Therefore, married farmers in Dodoma Municipality and Bahi District access agricultural credits more, so as to increase their household income enough to meet different family obligations.

4.1.5 Education level

Respondents were grouped into five categories with respect to educational levels. The findings show that, those who have not had formal education were 4% and 8% in Dodoma Municipality and Bahi District respectively; while those with primary education were 80% and 82% in Dodoma and Bahi District respectively (Table 4). The results show that credit borrowers in Dodoma Municipality were highly educated than in Bahi District whereby, 14% of sampled farmers in Dodoma Municipality have secondary education and above as compared to 6% of farmers in Bahi District with secondary education (Table 4). The level of education of farmers is reasonable to enable them to seek, receive and understand better agricultural technology and advice from extension workers (Godquin, 2004).

4.1.6 Farming experience

Farming experience refers to the number of years the household head use in farming business. Findings show that both borrowers in Dodoma Municipality and Bahi District

have the average farming experience of 18 and 18.5 years respectively (Table 4). Farmers having more experience in farming business have higher tendency towards using available resources so as to increase their farm outputs (Saima *et al*., 2010). The implication of this is that farmers with more farming experience have more access to agricultural credit from SEDA Credit scheme because of their advanced understanding and awareness of farming activities.

4.1.7 Farm size owned

It is the total owned cultivated land. The larger the owned cultivated land the more the labour required that demands additional capital that might be obtained through credits (Mpuga, 2004). It was found that most of the borrower farmers in Dodoma Municipality have large mean farm size of 8 acres compared to that of borrower farmers in Bahi District where the average farm size was 9.5 acres (Table 4). This means that by having larger farm size the credit borrower farmer have higher chances of introducing diversification of farm enterprises (Oboh *et al*., 2011). This has a pertinent economic importance of increasing farm output, and household income base but also safeguard a farmer against risks associated with farming business and household food insecurity. Furthermore, farm size relates positively to the chances to access credit because the owner of the large farm would usually have a higher capital requirement and this could entice owner to look for external financing opportunities. Therefore, farmers with larger size demand more agricultural credit from SEDA credit scheme.

Table 4: Socio economic characteristics in Dodoma Municipality and Bahi District

	Dodoma Municipality		Bahi District	
	Number	%	Number	%
Age distribution				
18-35	14	28	18	36
36-55	33	66	26	52
Above 56	3	6	6	12
Total	50	100	50	100
Education level				
No education	2	4	4	8
Adult education	1	2	2	4
Primary education	40	80	41	82
Secondary education	6	12	3	6
University/college	1	2		
Total	50	100	50	100
Marital status				
Single	4	8	5	10
Married	43	86	40	80
Divorced	1	2	2	4
Widow	2	4	3	6
Total	50	100	50	100
Gender distribution				
Male	32	64	27	54
Female	18	36	23	46
Total	50	100	50	100
Household members				
2-5	31	62	28	56
above 6	19	38	22	44
Total	50	100	50	100
Farm size(acres)				
Minimum	5	-	5	-
Maximum	25	-	60	-
Mean	8	-	9.5	-
Farming experience				
Minimum (years)	5	-	5	-
Maximum(years)	36	-	40	-
Mean (Years)	18	-	18.7	-

4.2 Extent of Credit Rationing to Smallholder Farmers in the study area

Results of this study reveals that the amount of loan received by smallholder farmers was less than loan applied, implying that SEDA applies some criteria to ration loans applied by members (Table 5). What is observed in Table 5 is the credit rationing where all applicants who were eligible got less amount than the amount requested. In the season ending 2010, only 38% and 41% of total loan applied were received by smallholder farmers in Dodoma Municipality and Bahi District implying that, 62% and 59% of the total loan applied were rationed out in both district respectively. For the season ending 2011, out of the total loan applied, only 66% were received by smallholder farmers in

Dodoma Municipality and 75% were received by smallholder farmers in Bahi District. During the season ending 2012, 55% and 69% of the total applied loan were received in Dodoma Municipality and Bahi District respectively. This means that for three consecutive years, 62%, 34% and 45% of the total applied loan in Dodoma Municipality were rationed out, while 59%, 25% and 31% of the total applied loan by small holder farmers in Bahi District were rationed out. SEDA credit scheme mainly applied a type of credit rationing whereby eligible loan applicants get less amount of loan than loan amount desired.

Table 5: Amount of loan received by farmers in Dodoma Municipality and Bahi District

	Dodoma Municipality			Bahi District		
	loan applied	loan received	%	loan applied	loan received	%
End of 2010	83 000 000	32 000 000	38	101 650 000	41 650 000	41
End of 2011	167 000 000	110 000 000	66	253 750 000	190 750 000	75
End of 2012	114 000 000	63 000 000	55	145 000 000	100 000 000	69

Source: SEDA, 2012

4.3 Loan Distribution among Smallholder Farmers in Dodoma Municipality and Bahi District

With regard to this aspect, results show that the 37% of the smallholder farmers in Dodoma Municipality received higher loan quantities under 300-400 category compared to 42% of smallholder farmers from Bahi District who received loan quantities under 200-300 category (Fig. 3). Farmers in Dodoma Municipality compared to farmers from Bahi District have access to different off farm activities which increase farmer's income and improve loan repayment capacity (SEDA, 2012). With increased level of income from off-farm activities, a farmer builds up confidence to borrow. Because cash obtained from off-farm activities could be used by a farmer in periods of low crops produce and low income from sales of low crop produce to rep ay the loan.
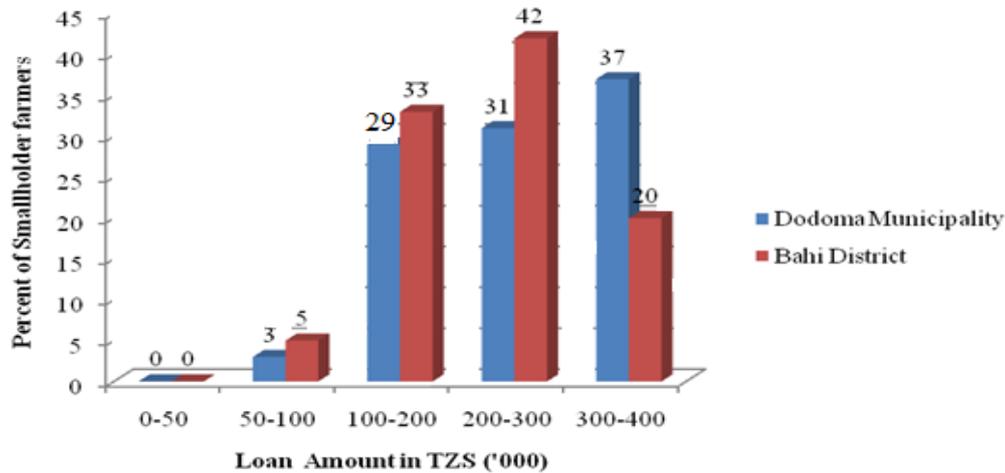
Figure 3: Loan distribution among smallholder farmers in Dodoma Municipality and Bahi District

4.4 Socio-economic Factors Influencing Demand for Agricultural Credit by Smallholder Farmers

4.4.1 Logit regression model estimation results

The logit regression model was used to assess the influence of smallholder farmer's socio economic characteristics on accessing SEDA agricultural credit. Table 4 summarizes the socio economic factors hypothesized to influence smallholder farmer's access to credit. As it can be seen from the table, the logit model fits well the data measured by Pseudo- R^2 (Cox and Snell= 0.574 Nagelkerke=0. 632). This high value of Pseudo – R^2 which are 57.4% and 63.2% for cox and Snell and Nagelkerke respectively, suggests good predictive ability of the model implying that the explanatory variables included in the model explains well the variation in the dependent variable.

According to Loviere *et al*. (2000) pseudo- R^2 sometime though rarely reaches the high values as those of R^2 in the linear regression, therefore the presented pseudo –R^2 were still considered in this study to have a good fit. In practice, Pseudo-R^2 of 57.4% and

63.2% are considered to be good enough for this study. Furthermore, the Chi- square statistics show that the model is highly significant at 1%, indicating that all the variables included in the model were jointly different from zero. All these confirm that there is a relationship between the dependent and explanatory variables included in the model.

4.4.2 Overall test of the relationship

The presence of the relationship between the dependent and combination of independent variables is based on the statistical significance of the model Chi-square in the (Table 6) termed model fitting information. In this analysis, the distribution reveals that the probability of the model Chi-square (128.493) was 0.000, less than the level of significance of 0.01(i.e. $p<0.01$). Therefore, we have sufficient evidence to reject the hypothesis that smallholder farmer's socio-economic characteristics have no significant influence on demand for agricultural credit in Dodoma Municipality and Bahi Districts.

As explained earlier in chapter 3 variables like Age, Gender, Household size, farm production cost, number of visit by extension officers, information with SEDA agricultural credit, education, and farm size were hypothesized to explain smallholder farmer's demand for SEDA agricultural credit. The logit regression analysis indicates that four variables were significant and positively related to dependent variable while five variables were not significant in explaining the variation in dependent variable (Table 6).

Access to extension services (EXCONT) by smallholder farmers was significant at 1% level of significance with positive marginal effect on credit demand. With increased number of visit/contact with agricultural extension officers, on one hand the household is likely to access better improved agricultural knowledge. Increased access to improved agricultural knowledge may create credit demands that could not be met by the owned

capital by the household, hence looking for credit from the institution (SEDA). On the other hand increase number of contacts with the extension officers, the household may also establish a social network which may help gain access to essential credit information. These findings are consistent with that of Beck (2007), who noted that extension services play a crucial role in empowering farmers with farming techniques, knowledge and farm management skills.

Household size (HHSIZE) is the other significant variable which is negatively related with demand for agricultural credit at 1% level of significance. This refers to the total number of family members of the household, both potential to work (active group) and less potential to work (inactive/dependant group). Household size is measured in man equivalent. Household size causes the negative marginal effect on the dependent variable in two ways; one, the larger the number of family labour (active group), the more the labour force available for production purpose. The more the labour force available, the lower the demand for hired labour. This means that there will be no or low cost for hired labour. This is in agreement with the findings of Yehuala (2008), who found that if the demand for hired labour decreases due to availability of family labour the need for credit decreases. Two, the higher the inactive/dependant group increases the potential social obligations like food, education, accommodation, medical care which are relatively expensive. This reduces farmer's confidence to borrow. Therefore; family labour was hypothesized to have negative impact on demand to credit.

Information (INFORM) is another significant variable which is positively related to the dependent variable at 1% level of significance. Information create awareness on credit availability to smallholder farmers. Through information provision smallholder farmers will be informed on credit type, credit availability conditions, procedures and benefits.

This implies that those individuals who are informed of the availability of credit services have better chances to access credit than those who are not informed. This is in consistent with Ennew and Binks (1997), who asserted that to ensure adequate flow of information is essential for borrowers to understand information needed by financial institutions and importance of that information in accessing credit. Furthermore, this is in agreement with Japelli and Pagano (2001), who suggested that accurate credit information can have greater predictive power for the performance of the borrower than the data contained in financial statements.

Average cost of hired labour (LBCOST) is a highly significant independent variable which is positively related to the dependent variable at 1% level of significance. Results show that 1% increase average cost of hired lobour, demand for credit increases by 0.913% (Table 6). The cost is in most cases necessary for farm activities like farm preparation, weeding and harvest. The low the family labour force available, the higher the demand for hired labour which lead to higher demand for external financing source (Yehuala, 2008). Therefore, farmers facing higher demand for hired labour, demand more credit than those with low production cost.

Regarding farm size (FARMSIZE), it is related positively to the chances to access credit because the owner of the large farm would usually have a higher capital requirement and this could entice owner to look for external financing opportunities. On the other hand, smallholder farmers who have more land are willing to demand more agricultural credit because of more available securities. The study conducted by Oboh *et al*. (2011) also showed that land plays a vital role as a collateral security for granting credit.

Location of an individual (whether living in Dodoma Municipality or Bahi District was also thought to be an influencing factor in credit access, but the regression results show that there is no significant relationship between location and ones' chances to access credit from SEDA credit scheme.

Regarding education, the coefficient is showing positive relationship between education and credit demand which means that with 1% increase in education, demand for credit increased by 0.012% (Table 6). This implies that increase in the number of schooling years, increases the probability of accessing agricultural credit from SEDA credit scheme. The findings of this study concur with the findings of Hussein (2007) who concluded that higher level of education is associated with the ability to access and comprehend information on credit terms and conditions and ability to complete application forms properly. Therefore, as the smallholder farmers get educated, they tend to demand more loans in order to perform agricultural activities in the best possible way by adopting modern methods of production.

With regard to age, it is positively related to the dependent variable meaning that, as the age increases, demand for credit by smallholder farmers also increase which is due to the reason that as smallholder farmers get old, they have more experience in farm production activities and resultantly become risk takers to take loan in order to diminish risk of low credit availability. Furthermore, having a higher age due to life experience will have much better association with credit institutions because they are mature enough to take family responsibilities and make rational decisions on credit use (Diagne et al., 2001). Therefore, this positive effect of age on credit demand is the evidence that age plays a vital role as a determinant of credit demand.

Table 6: Estimated results of binary logit regression

Variables	Coefficients(B)	Significance
CONSTANT	-11.338(-30.647)***	0.000
AGE	0.069(2.163)	0.141
GENDER	0.087(0.042)	0.838
HHSIZE	-0.594(-10.50)***	0.001
LBCOST	0.913(13.743)***	0.000
LOCATION	0.474(1.268)	0.260
EXCONT	1.060(20.601)***	0.000
INFORMATION	2.222(32.038)***	0.000
EDUC	0.012(0.013)	0.909
FARMSIZE	0.028(0.353)	0.553

Note: ***, ** and * Significance at 1%, 5% and 10% respectively
Chi-square: 128. 493 at 9 df and P<0.001
Number of Observation = 200
Pseudo R^2: Cox and Snell R square = 0.474 Nagelkerke R square = 0.63

4.5 Multiple Linear Regression Model

Gujarati (2004) pointed out that the linear regression method is useful in analysing data with a quantitative (numerical) dependent variable. This study used the linear regression method to determine factors used by SEDA to ration credit to smallholder farmers.

4.5.1 Multiple linear regression results

Regression analysis shows that among the explanatory variables, four were significant and positively related to the dependent variable, two were significant and negatively related to the dependent variable, and three variables were not significant. Age under 56 and above category, had a significant effect on SEDA agricultural credit rationing at 1% level of significance and coefficient has value of -794.104 which means that with every 1unit increase in age, amount credit demanded by the smallholder farmer decrease by -794.104 (Table7). Age was expected to have a positive relationship with the demand for loan. The productive capacity of the smallholder farmer increases with age. Consequently, the demand for productive fund also increases. However, observations from this study revealed that the older age, have the negative marginal impact on amount of credit demanded. These results are in line with results of Khalid and Temu (2007) who

found that older household heads are less educated and are more risky averse, implying that they are not ready to enter into dept obligations. Therefore the older the smallholder farmer the less amount of SEDA agricultural credit will be allocated to him.

Experience in SEDA credit use refers to the number of years the smallholder farmer uses credit from SEDA credit scheme. A farmer having more experience in SEDA credit use will have higher tendency towards using the sources of credit and the vice versa. Hence, the results show that this variable is having a positive and significant influence on the dependent variable at 1% level of significance (Table 7). Experienced farmers in using SEDA credit are in position to know terms and conditions needed by SEDA as prior information to organize and manage their business to comply with SEDA conditions. These results concur with the findings of Hashi and Toci (2010) who argued that experience ensures adequate flow of information to essential borrowers to understand information needed by banks and importance of that information in accessing bank credit. The same results were observed from this study where the experience in SEDA credit use as an independent variable is showing significant effect on SEDA agricultural credit demand at 1% level of significance and coefficient value of 12243.474. This means that with every 1 unit increase in experience in using SEDA credit, amount of credit rationed to the smallholder farmer increase by 12243.474 units.

Group guarantee as an independent variable is showing significant effect on SEDA agricultural credit rationing at 5% level of significance and coefficient has value of 566.11 which means that with every 1 unit increase in number of group guarantors, amount credit rationed to the smallholder farmer increase by 566.11. These results agree with the findings of Gerald and Deogratius (2013) who found that the membership of group increases ability to access higher loan amount from SACCOS following that group

guarantee (solidarity group) act as one of the loan securities. Therefore, it is SEDA which requires group formation by potential borrowers as a precondition to access productive loans. This means that the amount of agricultural credit rationed to the smallholder farmer increase with increase in number of group members.

Value of collaterals is showing highly significant impact on credit demand at 1% level of significance. The coefficient value expresses that with 1unit increase in value of collaterals will bring 0.172 increases in amount of credit rationed to the smallholder farmer. These results agree with the findings of Khalid and Temu (2007) who found that the value of collaterals owned by a household reflects the relative worthiness of the household and increases ability to access higher loan amount. Furthermore, collateral reduces the riskiness of a loan by giving the financial institution a claim on a tangible asset without diminishing its claim on the outstanding debt (Bougheas *et al.,* 2005)

Amount of savings by smallholder farmer was highly statistically significant on amount of credit rationed at 1% level of significance. The coefficient value expresses that with 1unit increase in value of savings will bring 1.1154 increases in amount of credit allocated to the smallholder farmer. Savings may also be used as security for loans and therefore may increase to higher demand for credit. These findings are in line with Gerald and Deogratius (2013) who found that the savings of members also were regarded as collateral that enabled members to borrow from SACCOS according to his/her savings capacity. This implies that an increase in savings by the smallholder farmer will increase their security to be given higher amount of agricultural credit from SEDA credit scheme. As revealed by the findings this study, distance in terms of hours used by the household to reach SEDA office has come up as a highly significant variable at 1% level of significance. The coefficient signifies that the amount of credit rationed to the smallholder

farmers will decrease by 28115.880 with 1 unit increase in distance from SEDA office. The negative relation was expected because for distant farmers the SEDA office will incur more cost in monitoring borrower farmers *i.e.* when follow up is necessary. The findings of this study concur with the conclusion of Hashi and Toci (2010) who indicated that farming household who are near to the credit source have a positive effect on the amount of credit demanded and the vice versa. This implies that smallholder farmers near to SEDA office were likely to get higher loan than those who were far away from the credit source.

Regarding the average income from off-farm activities, it was found to be positively related to the amount of credit rationed to the smallholder farmer. Results show that for one unit increase in off-farm income, the amount credit rationed increased by 0.062. With increased level of income from off-farm activities, farmers build up confidence to borrow. Cash obtained from off-farm activities could be used by farmers in periods of low crop produce and low income obtained from crop sales to repay the loan. These results agree with the findings of Khailid and Temu (2007) who found that increased income from off-farm activities was an indication for the high purchasing power of the farmer which increases the worthiness of the farmer accessing credit in the eye of the lending institution.

The Results from multiple regression analysis indicated that the included independent variables accounted for 83.6% of the variation of the average loan obtained from SEDA. The F-test was significant at 5% level of significant (F=51.097), implying that independent variables significantly explain the variation in the amount of loans obtained by farmers from SEDA (Table 7).

Table 7: Estimated results from linear regression analysis

Variable	Unstandardized Coefficients	Significance
Constant	160248.782(3.633)***	0.000
AGE >56 Yrs	-794.104(-2.577)***	0.012
AOINCOME	0.062(0.52)	0.295
GUARANTORS	5664.116(1.924)**	0.054
EXPSEDA	12243.474(3.231)***	0.002
MULTLOAN	-252(-1.416)	0.257
DISTANCE	-28115.880(-15.88)***	0.000
SAVINGS	1.115(4.570)***	0.000
LATEPAYMENTS	-0.148(-2.128)	0.36
COLLATERAL	0.172(4.056)***	0.000

Note: *, **, and * significance at 1%, 5% and 10% respectively**
Number of observations= 100
F=51.097 at P<0.001
R square = 0.836, Adjusted R square = 0.820
 Durbin Watson = 1.996

4.5.2 Multicollinearity diagnosis

To study the factors influencing SEDA credit rationing to smallholder farmers, data gathered from 200 farmers were subjected to multiple linear regression analysis. The statistical software used for analyzing the data was SPSS 16.0. Prior to running the multiple regression models, both the continuous and dummy explanatory variables were checked for the existence of multi-collinearity problem. The problem arises when at least one of the independent variables is a linear combination of the others. The existence of multi-collinearity might cause the estimated regression coefficients to have the wrong signs and smaller t-ratios that might lead to wrong conclusions.

There are two measures that are often suggested to test the presence of multi-collinearity. These are: Variance Inflation Factor (VIF) for association among the continuous explanatory variables and contingency coefficients for dummy variables (Gujarati, 2004). The technique of variance inflation factor (VIF) was employed in this study to detect the problem of multi-collinearity among the continuous variables. According to Gujarati (2004), VIF can be defined as: VIF $(x_i) = $ $1/1-R^2$

Whereas, the square of multiple correlation coefficients that results when one explanatory variable (Xi) is regressed against all other explanatory variables. The larger the value of VIF the multi-linearity of the variable X_i is. As a rule of thumb, if the VIF of a variable exceeds 10, there is a multi-collinearity problem. The VIF values displayed below (Table 8) have shown that all the explanatory variables have no serious multi-colinearity problem.

Table 8: Variance inflation factor for explanatory variables

Variables	R^2	VIF
AGE	0.08	1.00
SAVINGS	0.017	1.00
DISTANCE(Hours spent)	0.003	1.00
EXPRSEDA (years with SEDA credit)	0.031	1.00
LATEPAYMENT (Amount in TZS paid as penalty)	0.074	1.00
COLLATERAL (Amount in TZS)	0.001	1.00
MULTILOAN (Amount in TZS)	0.084	1.00
GUARANTORS(Number of group members)	0.056	1.00
AOINC (Average off-farm income in TZS)	0.035	1.00

4.6 Performance of SEDA in Group Formation, Loan Disbursement and Repayment

4.6.1 Performance of SEDA in group formation for 2009/2010 season

At the commencement of the agricultural loan as a product in 2009/2010, there were 35 groups of smallholder farmers with 399 members, whereby 203 were males and 196 were female farmers (Table 9). This number rose to 126 groups in 2010/2011 season. This is an increase of 260%, with a total number of 1351 clients, whereby 677were males and 674 were females which is 233% and 243% respectively (SEDA, 2012).

Table 9: Performance of the formation of solidarity groups 2009/2010

Variables	End of 2010	End of 2011	Percent increase/ Decrease
Groups	35	126	260[S]
Male	203	677	233[S]
Female	196	674	243.9[S]

Source: SEDA, 2010/2011

Note: [S] denote an increase

4.6.2 Group formation in 2011/2012 season

The findings reveal that, at the 2011/2012 season, there was a decrease of 38% of farmers groups, where male and female farmers decreased by 37% and 51% respectively (Table 10). The reason for decrease in number of groups and clients were (a) Variability of rainfall, that is, there was scarcity of rainfall in the area and hence farmers were afraid on the repayment of the loan due to expected low farm outputs, this is because their farming activities are merely rain-dependent (b) some of the clients taking agricultural loan were also taking *biashara* loan from the same institution (SEDA). Therefore, they felt huge burden on the side of repayment that is why they decided to drop out agricultural loan (SEDA, 2012).

Table 10: Performance of the formation of solidarity groups 2011/2012

Variable	End of 2011	End of 2012	Percent increase/ Decrease
Groups	126	78	38[d]
Male	677	421	37[d]
Female	674	324	51[d]

Source: SEDA, 2011/2012
Note: [d] a decrease

4.6.3 Performance of loan disbursement in Dodoma Municipality and Bahi District

With regard to this aspect, results shows that in the season ending 2010 a total of TZS 32 000 000 and TZS 41 650 000 were disbursed to Dodoma Municipality and Bahi groups of smallholder farmers respectively. In the season ending 2011 there was a high disbursement rate to Bahi District compared to Dodoma Municipality farmer's groups (Table 11). The increase was due to increase of farmers group taking the loan as the result of more information and advertisements were made to farmers clients about the product. However, farmers in both districts reported a decreased rate in taking loan from SEDA in the season ending 2011/2012. Findings show that there was a decrease rate of 42% and 47% in Dodoma Municipality and Bahi District respectively (Table 11). The amount

disbursed decreased due to a number of reasons including, (a) some individual farmers were screened out by the group members in the subsequent loan due to their incompatible characters in taking the loan; (b) Some clients taking agricultural loan failed to pay back the loan due to the low price of their produce at a time of repaying the loan.

Table 11: Performance of the loan disbursement in Dodoma Municipality and Bahi District

	Dodoma Municipality		Bahi District	
	Loan TZS	Percent (s/d)	Loan TZS	Percent (s/d)
End of 2010	32 000 000		41 650 000	
End of 2011	110 000 000	243^S	190 750 000	359^S
End of 2012	63 000 000	42^d	100 000 000	47^d

Source: SEDA, 2012
Note: ^{s} and ^{d} an increase and decrease respectively

4.6.4 Performances of SEDA loan repayments

4.6.4.1 Performances of loan repayments in Dodoma Municipality

The findings show that there was an improvement in repayment rate by 1% from the season ending 2010 to the end of 2011 season (Table 12).   The reason for the improvement was partly due to the subsequent training on loan repayments to farmers and follow-up effort applied by SEDA credit officers.

Table 12: Performance of loan repayment in Dodoma Municipality

Season	Total loan principal+ interest (TZS)	Total repayment (TZS)	Percent of Repayments
End of 2010 season	40 000 000	39 125 000	97
End of 2011 season	137 500 000	136 100 000	98

Source: SEDA, 2012

4.6.4.2 Performances of loan repayments in Bahi District

The findings show that repayment rate in Bahi District has decreased from 96% at the end of 2010 season to 95% at the end of 2011 (Table 13). The Reasons for the decrease were partly due to unfavourable weather conditions which reduced crop production and partly were due to misallocation of loan by the farmers, which reduced their repayment capacity.

Table 13: Performance of loan repayment in Bahi District

Seasons	Total loan principal+ interest (TZS)	Total repayment (TZS)	Percent of Repayments
End of 2010 season	52 062 500	50 312 500	96
End of 2011 season	238 437 500	227 587 500	95

Source: SEDA, 2012

4.7 Challenges Encountered in Loan Acquisition and Disbursement

4.7.1 Challenges encountered by farmers in loan acquisition from SEDA

A number of challenges were reported by borrower farmers in both Dodoma Municipality and Bahi Districts regarding the acquisition of loan from SEDA credit scheme as presented in (Table 14). Many borrowers reported to have encountered more than one problem in both district. Small amount of loan received, monthly savings to SEDA account, compulsory attendance of all group members to SEDA office during loan repayment, long and bureaucratic procedures in loan processing were mentioned to be the major problems faced by farmers in both Dodoma Municipality and Bahi District.

Small amount of individual loan received, was inadequate to meet farmers requirements. Some farmers decided to cultivate small land areas. Monthly saving to SEDA account by farmers was made compulsory by SEDA office as part of the loan repayment which is against the agreed period of 9 months grace period. Farmers argued that the amount of cash deposited monthly could have been used to invest more in agricultural production. Furthermore, farmers argued on long bureaucratic procedures in loan acquisition to be costfull in both time and cash as they were located in remote rural areas.

Other problems were poor customer service by SEDA staff, poor involvement of farmers in decision making, high distance from SEDA office, small loan increment, and lack of visitation by SEDA staff to farmers. However, 12% and 16% of sampled borrower farmers in Dodoma Municipality and Bahi District respectively reported not to have encountered problems in acquiring loan from SEDA.

Table 14: Challenges faced by farmers in acquisition of loan from SEDA

| | Dodoma Municipality | | Bahi District | |
| | N=50 | | N=50 | |
	Number	%	Number	%
Small start amount of loan disbursed	45	90	42	84.0
Monthly savings to SEDA	43	86	41	82.0
Distant from SEDA	32	64	40	80.0
Poor customer service	33	66	17	34.0
Long bureaucratic procedures	37	74	40	80.0
All group members attendance to SEDA	39	78	38	78.0
Poor farmers participation in decision making	9	18	2	4.0
Higher interest rate	21	42	15	30.0
Small loan increment	26	52	34	68.0
Lack of SEDA staff Visitation	7	14	13	26.0
None	6	12	8	16.0

Note: Farmers reported more than one problem

4.7.2 Challenges faced by SEDA in loan disbursement

Acquisition of agricultural loan from SEDA by smallholder farmers faces number of challenges. These include: the flow of funds which has been irregular and inadequate. Sometime funds are received very late from the funding agencies and these delays farm activities. Transport facilities by SEDA are not enough to allow adequate follow-up of borrower farmers. As a result, farmers are rarely visited. Infrastructure is very poor, some areas are very remote and hence it is difficult for farmers to be visited frequently. Untrustworthiness is another challenge faced by SEDA from its borrowers. Some farmers join the group temporarily for the purpose of fulfilling loan conditions. Such groups normally break-up after its members have received loan. There are cases where farmers have left their villages in an attempt to evade loan repayment.

Non-repayment yet another problem faced by SEDA. When loans are not repaid on time they affect the general operations of the institution because the money is required for further disbursement in the forthcoming season. Such money is also required to meet other costs such as those covering administration, transport and maintenance.

4.8 Contribution of Agricultural Loan to Farmer's Income

4.8.1 Credit contribution to farmer's income in Dodoma Municipality

Using mean income value of non users as the control group, the study found that both credit users and non credit users experienced a growth in income associated with common factors *i.e.* prevailing climate and common farming practices. The findings show that the mean income of credit users increased from TZS 469 117 at the end of 2010 to TZS 694 078 (47%) at the end of 2012 season, while that of non borrowers increased from TZS 327 719 at the end of 2010 to TZS 411 675 (25%) at the end of 2012 (Table 15). The borrower farmers in Dodoma Municipality reported a higher average income value of TZS 141 005 (22%) over the non borrowers as a result of using agricultural credit from SEDA credit scheme.

Table 15: Contribution of agricultural loan to farmer's revenue in Dodoma Municipality (TZS)

	Before change (End of 2010 season)	After change (End of 2012 season)	Variance
Group 1 (n=34) (Treat)	469 117	694 078	224 961
Group 2 (n=34) (Control)	327 719	411 675	83 956
Variance			141 005

4.8.2 Agricultural credit contribution to farmer's income in Bahi District

Likewise, both borrowers and non borrowers in Bahi District experienced growth in mean income at the end of 2012 season due to common farming practices and prevailing climate (Table 16). Borrower farmers reported an average increase of TZS 261 020 (59%) at the end of 2012, while non borrower farmers reported an average increase of TZS 74 040 (22%) at the end of 2012 season. These findings agree with the findings of Akram *et al*. (2008) who found that agricultural credits has been considered necessary for smallholder farmers with little capital, as means of getting access to improved agricultural technology and increase their farm productivity. Due to the fact that both

borrowers and non borrowers were operating farm activities under the same climate, the higher average income of the borrower farmers was contributed by the use of agricultural credit from SEDA credit scheme.

Table 16: Contribution of agricultural loan to Farmers revenue in Bahi District (TZS)

	Before change (End of 2010 season)	After change (End of 2012 season)	**Variance**
Group 1 (n=34) (Treat)	441 117	702 137	261 020
Group 2 (n=34) (Control)	335 000	409 040	74 040
Variance			186 980

4.8 Hypotheses Testing

Hypothesis1; H_0: Smallholder farmer's socio-economic characteristics have no influence on credit demand.

A logistic regression analysis was conducted to test the null hypothesis that "Smallholder farmer's socio-economic characteristics have no influence on demand for agricultural credit." An independent T-test of the full model against credit demand was statistically significant, indicating four predictors as household size (HHSIZE), average hired labour cost (LBCOSST), number of contacts with extension service in a year (EXCONT) and information on SEDA existence (INRFMATION) which influenced credit demand by the smallholder farmer at (chi square = 128.493 $p < 0.001$ with df = 9). Nagelkerke's R^2 of 0.63 indicated a moderately strong relationship between the independent and dependent variable. Therefore, we have sufficient evidence of rejecting the null hypothesis at 1% level of significance.

Table 17: Influence of farmer's socio economic characteristic on credit demand

Variable	Coefficients (β)	Significance
HHSIZE	-0.594(-10.50)**	0.001
LBCOST	0.913(13.743)***	0.000
EXCONT	1.060 (20.601)***	0.000
INFORMATION	2.222(32.038)***	0.000

Note: *** Significance at 1% level of significance
Chi square = 128.493 p< 0.001
Pseudo R^2 : Cox and Snell R square = 0.474, Nagelkerke R square = 0.63

Hypothesis 2; H_o: There is no significant difference in revenue between smallholder with and without loan from SEDA credit scheme.

An independent t-test Analysis was used to test the hypothesis that "there is no significant difference between smallholder with and without loan from SEDA credit scheme". An independent t-test was used to determine whether a significant difference exists in the revenue performance between credit users and non users in Dodoma Municipality and Bahi District. Findings show that the mean value of the revenue by the credit borrower farmers was a significantly higher than the mean value of the revenue by the non borrower farmers at 1% significance level in both districts. Likewise, Findings show that the mean difference of the revenue between borrower and non borrower farmers was TZS $2.962*10^5$ and TZS $3.226*10^5$ in Dodoma Municipality and Bahi District respectively. Furthermore, borrower farmers in Bahi District performed higher in revenue than borrower farmers in Dodoma Municipality by the mean difference of TZS $0.264*10^5$ (Table 18).

Table 18: Revenue/income performance in Dodoma Municipality and Bahi District

Variable estimated		Dodoma Municipality		Bahi District	
		Mean difference	sig	Mean difference	sig
Revenu/income TZS	Credit users				
	Non users	$2.962*10^5$ (12.069)***	0.000	$3.226*10^5$ (5.957)***	0.000

Therefore According to the T-test, there is sufficient evidence to reject the null hypothesis that; there is no significant difference in terms of revenue of the smallholder farmers with and without loan from SEDA credit scheme at level of significance (p<0.001).

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The overall objective of this study was to assess the factors influencing demand and rationing of SEDA agricultural credit to smallholder farmers in Dodoma Municipality and Bahi District in Dodoma Region. The specific objectives were:

(i) to investigate socio-economic factors influencing demand for SEDA agricultural credit by smallholder farmers in Dodoma Municipality and Bahi District ii) to determine the extent of credit rationing in Dodoma Municipality and Bahi District (iii) to assess the factors influencing SEDA agricultural credit rationing to smallholder farmers in Dodoma Municipality and Bahi District (iv) to assess the performance of SEDA in loan disbursement and repayment and (v) to assess the contribution of SEDA agricultural credit to the income of the smallholder farmers in Dodoma Municipality and Bahi District. The ultimate goal was to offer suggestions and recommendations for possible improvement of SEDA lending procedures as well as improving agricultural credit lending scheme.

Data from sampled farmers were gathered and secondary information on SEDA lending conditions and its performance were also collected. Descriptive statistics, binary logistic, multiple linear regression analysis, variance in difference analysis and paired t-test were used to deduce necessary findings and testing of the hypothesis.

The marginal effects after logit regression analysis were used to interpret the results of the study to establish the influence of each variable on the variation of the dependent variable.

From the results of binary logistic regression analysis, it was found out that factors such as average hired labour cost (LBCOST), number of contact with extension officers in year (EXCONT), information on SEDA existence (INFOMATION) influenced agricultural credit demand positively and statistically significant at 1% level of significance, while household size (HHSIZE) influenced credit demand negatively at 1% level of significance. Other factors such as age of respondent (AGE), education level (EDUC), farm size (FARMSIZE), gender of respondents (GENDER) and location were no statistically significant but had a positive relation on dependent variable

Therefore, basing on findings from binary logit regression there was sufficient evidence at 1% level of significance to reject the null hypothesis which state that 'Smallholder farmer's socio-economic characteristics have no influence on demand for agricultural credit in Dodoma and Bahi Districts'.

With regard to extent of credit rationing, results showed that total applied loan by smallholder farmers were rationed to a reasonable extent both districts. This means that for year ending 2010, 2011 and 2012, out of the total applied loan in Dodoma Municipality, 62%, 34% and 45% were rationed out, while 59%, 25% and 31% of the total applied loan in Bahi District were rationed out respectively.

On the credit rationing side, four variables: Group guarantors, experience with SEDA credit use, saving behavior, approximate value of collaterals, age and distance from SEDA office significantly influenced credit rationing to smallholder farmers in the study area while two variables.

Starting with, value of collaterals (COLLATERAL), amount of savings (SAVINGS), and experience with SEDA credit use (EXPSEDA) were positively and statistically influenced credit rationing at 1% of significance. Distance from SEDA office (DISTANCE) negatively influenced credit rationing at 1 percent of significance. Group guarantee as an independent variable showed significant effect on SEDA agricultural credit rationing at 5 percent level of significance. Other factors like late payments, existence of multiple loan were not statistically significant but negatively influenced credit rationing while average income from off farm activities had a positive influence on credit rationing.

Regarding SEDA performance; like several other credit institutions in low income countries, SEDA has faced loan non- repayment problems. Whereas the overall repayment rate was 97% and 98% for Dodoma Municipality and 96% and 95% for Bahi District at the end of 2010 and 2011 seasons respectively. This implies that non-repayment rates alternate over time depending on factors that emanates from both the institution and borrowers.

Difference in difference results show that credit borrower farmers in both Dodoma Municipality and Bahi District had have a higher mean income by a favourable variance of TZS 141 005 and TZS 186 980 respectively. The variance is due to the use of agricultural credit by borrower farmers.

Following the hypothesis testing, the results from logistic regression indicated that independent variables like household size (HHSIZE), average hired labour cost (LBCOSST), number of contacts with extension service in a year (EXCONT) and information on SEDA existence (INRFMATION) influenced credit demand by the smallholder farmer at (chi square = 128.493 p < 0.001 with df = 9). Nagelkerke's R^2 of

0.63 indicated a moderately strong relationship between independent and dependent variable. Therefore, there was sufficient evidence of rejecting the null hypothesis "smallholder farmer's socio economic characteristics had no influence on credit demand" at $p < 0.001$. An independent t-test analysis showed that there was a significant difference in revenue/income between borrowers and non-borrowers farmers. Results show that there were a mean difference in income at 1percent level of significance by TZS $2.96*10^5$ and TZS $3.226*10^5$ in Dodoma Municipality and Bahi District` respectively. Therefore, we have sufficient evidence at 1percent level of significance to reject the null hypothesis that 'there is no significant difference in performance between smallholder farmers with and without credit'.

5.2 Recommendations

5.2.1 Recommendations for SEDA management

Based on the major findings and conclusions of this study the following are the recommendations that may lead to better performance of SEDA. These recommendations can also be useful to other related development agencies in Tanzania, particularly agricultural credit programmes.

First, to facilitate credit use, SEDA should put an emphasis on credit management training to assist farmers to better management of their loans. The most successful credit scheme is the one that integrates loans with literacy training particularly on basic records keeping and accounting. This will ensure that farmers are equipped with the necessary skills to enable them use their loans effectively and productively. To make it simple, introduction of record books to borrowers and regular monitoring of proper recording of necessary information is important.

Second, close visit and supervision of farmers are important since they facilitates proper use of credit. Visit by extension officers and other related personnel is also important to assist farmers with technical problems that they face. Such an arrangement will ensure that farmers use inputs and raise sufficient yield per unit area and be able to repay their loans upon sale of their crop produce.

Third, to address the non-repayment problems, it is necessary for SEDA to design a more effective follow-up methods, incentives and penalties which would influence borrowers to repay their loan promptly. Such measures may include prior identification, selection and screening of potential borrowers. In addition to the above there is also need for the effective monitoring of credits use through regular visits to farmers, both during production and harvesting seasons.

Fourth, for SEDA to serve a large number of its members closely and effectively, it has to establish field offices in remote areas where farmers live. This is because most of borrower farmers are available in rural remote area where transport facilities are poor. It is very expensive for a low-income farmer to make several visits to SEDA office which is located far from their rural residence. They waste both time which could be used in farm production activities and money which could either be used in production or consumed at home. Implementation of these recommendations can improve the effectiveness and efficiency of SEDA and hence its sustainability.

5.2.2 Recommendations to credit borrowing farmers

Borrower farmers should make a prior visit to the financial institution (SEDA) before applying for the loan in order to know the loan conditions and procedures required by the institution. This will enable farmers to develop the conditions and characters i.e.

collaterals in both physical and human collateral so as to comply with the institution (SEDA) requirements. This is the prior preparation for the smallholder farmers which will position the farmers to get bigger loan size to invest in agricultural production activities and improve farm productivity.

5.2.3 Recommendations for further research

Currently, group lending approaches have been widely used by many credit programmes, SEDA inclusive. The system has been suggested to be a proper means of managing recovery of loans and reducing lending costs. However, the two aspects appear to exist even with this approach. This study therefore suggests further research on issues related to

(i)   Analysis of non-repayments loans in group lending

(ii)   Evaluation of borrower-lender transaction costs in group lending methodology.

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APPENDICES

Appendix 1: A questionnaire administered to credit-borrowers farmers in Dodoma Municipality and Bahi District

Title: Factors Influencing SEDA Agricultural Credit Rationing To Smallholder Farmers In Dodoma Municipality And Bahi District.

A. Basic Information

Questionnaire No: ---------------------------------------

1. Date: -- Interviewers' Name: -------------------------

2. District: ---------------------------------- division: ----------------------------- Village: -----------

3. Farmers Name: -- Age: --------------

4. Gender   1= Male   ( )

                   2= Female   ( )

5. Marital status   1= single   ( )

                   2= Married   ( )

                   3= Divorced ( )

                   4= widow   ( )

6. Household size: ----------------------------

7. Farmers experience in farming businesses: ---------------------- (Years)

8. Farmers level of education:

                        1. No formal education   ( )

                        2. Adult education   ( )

                        3. Primary education   ( )

                        4. Secondary education   ( )

                        5. Other (specify)   ( ) -----------------------------

B. Agriculture Production

9. (a) D o you have land for agricultural production?

   (b) Would you tell me how much land, you have for production------------ (acres)

10) a) Do you have access to extension services?

   b) Would you tell me how may contacts you receive in year from extension officers?

C Household Farm Income

11. Out of the crops produced which one did you sell, what amount and at what price in

the last two years

Crop	2010 bags/kilo	Price per kg/bag	2011 bags/kilo	Price per kg/bag

12. Out of the livestock raised which one (product) did you sell, what amount and at what

price in the last two year

Livestock	Product	Amount Sold			
		2010		2011	
		Quantity	Price/Unit	Quantity	Price/Unit
Dairy cattle					
Beef cattle					
Broilers					
Layers					
sheep					
pigs					
goats					
Others(specify)					

D. Off-Farm Activities

13. Apart from farming activities, do you have other activities that brings income into

your household? And how much did you get in the last two years

Other Source of income 1= yes ( ) 2= no ( )	2010 Amount in Tsh	2011 Amount in Tsh
Formal employment		
Selling charcoal/firewood		
Carpentry		
Small business		
Brick making		
Mansory		
Other (specify)		
Total		

E. Labour and other Inputs Information

14. If hired labour was used, indicate cost per operation per acre

Operation/activity(TZS)	C1;	C2;	C3;	C4;
Land preparation				
Cultivation				
Planting				
Weeding				
Harvesting				
Transporting				
marketing				

Where C1-C4 are Crop1 – Crop4 respectively

15. Did you purchase any inputs for your farm production? In

2009/2010 season   1= Yes ( )   2= No ( )   2010/2011 season   1 = Yes ( ) 2 = No ( )

16. If yes, indicate the inputs, quantity, costs and the respective major farm business

Crop/Livestock	Type of the inputs used			Inputs costs (TZS)	
	Quantity	2010	2011	2010	2011

F. Assets and Loans Security

17.(a) Do you have assets you are willing to offer so as to get the loan 1)

Yes……………. 2) No……………

b) if yes, would you mention assets that you have (own) which can be regarded as the

security (collateral) for the loan. (E.g. machinery, house, farm, TVs, Radio etc)

Assets	Number of assets owned	Value

G. SEDA Credit Demand

18. (a) Since when have you heard/informed about SEDA credit

Scheme?.................(Years/Months)

(b)How many times have you applied for credit in the past two years? And how many

times were you successful in securing credit?

Times applied…………………. times received…………………

(c) what is loan size you received in the previous cycle?----------------------

(d) how much time do you spend from home to SEDA office?........................

19. (A) did the farmer receive the amount of loan requested?

1= Yes ()   2= No ()

(b) If not what reasons were given by SEDA for provision of the

different   amount? ....

c) Do you have other loan from other financial institutions? i) Yes……. ii) No……..

d) If Yes, would you tell how much UNPAID loan you have ……………………

e) Do have a saving account? 1) Yes ……. 2) No …………

f) If yes, would you tell me how much do you have in your saving account?...............

20. (a) state the loan repayment procedure by

SEDA…………………………………………………………………….................

(b) indicates the amount repaid and arrears (if any)

seasons	Amount repaid Tsh	Arrears Tsh

21. If you are in arrears, give reasons…………………………………………………

22. What sort of penalties are imposed by SEDA for the late repayment or loan

default…………………………………………………………………………………

23. (a)Were the loan disbursement made on time before the beginning of the cropping

season?

1 = Yes ( )   2 = No ( )

(b) If not what were the reason by SEDA for

    the delay…………………………………………………………………......

24. What was the procedure of getting loan from SEDA? List the

    procedure…………………………………………………………………………

25. What was the purpose of seeking loan from SEDA? …………………………

26. How long did it take from applying and getting loan from SEDA? (Months)

27. What is the gestation period to begin repayment of the loan………….. (Months)

28. Do you think that the existing credit facilities are adequate for your crop production

    needs?   1 = Yes ( )   2 = No ( ).

    Explain……………………………………………………………………………….

29. What is your opinion about the efficiency of the SEDA in

    (a) Delivery of credit…………………………………………….………….................

 (b) Repayment of the credit…………………………………………………………..

30. Do you have any opinion, suggestions ....

THANK YOU VERY MUCH FOR YOUR ATTENTION AND COOPERATION

Appendix 2: A questionnaire administered to non-credit borrowers farmers

(households) in Dodoma Municipality and Bahi District.

Title: Factors Influencing SEDA Agricultural Credit Rationing To Smallholder Farmers

In Dodoma Municipality And Bahi District:

A. Basic Information

Questionnaire No: ---------------------------------------

1. Date: --- Interviewers' Name: ----------------------------

2. District: -- division: -------------------------------- Village: ----------

3. Farmers Name: --- Age: --------------

4. Gender   1= Male   (   )

                   2= Female   (   )

5. Marital status   1= single   (   )

                           2= Married   (   )

                           3= Divorced (   )

                           4= widow   ( )

6. Household size: ----------------------------

7. Farmers experience in farming businesses: ----------------------- (Years)

8. Farmers level of education:

                   1. No education   (   )

                   2. Adult education   (   )

                   3. Primary education   (   )

                   4. Secondary education   (   )

                   5. Other (specify)   ( ) -----------------------------

B. Agriculture Production

9. (a) D o you have land for agricultural production?

   (b) Would you tell me how much land, you have for production------------ (acres)

10) a)Do you have access to extension services?

   b) Would you tell me how may contacts you receive in year from extension officers?

C. Household Farm Income

11. Out of the crop produce which one did you/do you sell, amount and at what price in

   the last two years

Crop	2010 bags/kilo	Price per kg/bag	2011 bags/kilo	Price per kg/bag

12. Out of the livestock raised which one (product) did you/do you sell, amount and at

   what price in the last two year

Livestock	Product	Amount Sold			
		2010		2011	
		Quantity	Price/Unit	Quantity	Price/Unit
Dairy cattle					
Beef cattle					
Broilers					
Layers					
sheep					
pigs					
goats					
Others(specify)					

D. Off-Farm Activities

13. Apart from farming activities, do you have other activities bringing income into your

household? And how much did you get in the last two years

Other Source of income 1= yes ( ) 2= no ( )	2010 Amount in Tsh	2011 Amount in Tsh
Formal employment		
Selling charcoal/firewood		
Carpentry		
Small business		
Brick making		
Mansory		
Other (specify)		
Total		

E. Labour and other Inputs Use Information

14. If hired labour was used, indicate cost per operation per acre

operation/activity(TZS)	C1;	C2;	C3;	C4;
Land preparation				
Cultivation				
Planting				
Weeding				
Harvesting				
Transporting				
marketing				

Where C1-C4 are Crop1 – Crop4 respectively

15. Did you purchase any inputs for your farm production? In

2009/2010 season   1= Yes ( )   2= No ( )   2010/2011 season   1 = Yes ( ) 2 = No ( )

16. If yes, indicate the inputs, quantity, costs and the respective major farm business

Crop/Livestock	Type of the inputs used			Inputs costs (Tsh)	
	Quantity	2010	2011	2010	2011

F. Assets and Loans Security

17. (a) Do you have assets you are willing to offer so as to get the loan 1)

Yes……………. 2) No……………

b) if yes, would you mention assets that you have (own) which can be regarded as the

security (collateral) for the loan. (E.g. machinery, house, farm, TVs, Radio etc)

Assets	Number of assets owned	Value

Appendix 3: Checklist administered to the financial institution (SEDA)

Basic Information

1. Name of the Institution………………………………………………………

2. District………………………………………..

   Division…………………………………………………………………………..

3. Nature/type of the

   1. Government institution

   2. Non-government institution

   3. .Donor agency

   4. Coorperative society

   5. Other specify

4. Date of establishment of the branch…………………………………………...

5. What is the major objective of the

   institution?.. …………………………...

6. What kind of credit do you offer? 1=kind 2= cash 3= both

7. Type of credit offered by the institution

   1= Individual loans to individual farmers

   2= group loans to group farmers

   3= others

8. What are the requirements for the credit/loan eligibility?.....................................

9. How is repayment of the loan organized?

   1= weekly

   2=monthly

   3=others specify…………………………………………

10. What factors are considered in scheduling

repayments?..

What is the institutional response upon the

a) Delayed repayments?...

b) Default loan…………………………………………………………………

11. Do you assess smallholder agricultural business before authorizing credit?

1= yes   2= no

12. What parameters do you consider during agricultural business assessment?............

14. What loan conditions do you seems difficult to meet amongst your clients?.............

15. Do you have any aspect of improving them?   1=yes   2= no

16. If the answer from qn 13 is No,what prevent you from improving them?.................

17. What are the major institutional credit related problems?.......................................

18. What is your current interest rate……………………………………….…………

19. What is your loan ceiling?...

20. What are the policies and procedures of obtaining loan from your

institution?...

21. What are the institutional strategies to ensure the sustainability of credit

programs?...

22. What are your institutional future plans(visions)……………..…………………

23. What are the opportunities available in agricultural lending?.................................

24. What are the main problems/challenges encountered in agricultural lending?

THANK YOU FOR YOUR ATTENTION AND CO-OPERATION