RURAL SMALL SCALE FARMERS' ACCESS TO CREDIT IN IRINGA AND KILIMANJARO REGIONS, TANZANIA

BY

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ABSTRACT

This study is on rural small scale farmers' access to credit in Tanzania. The overall objective of the study was to investigate the factors that determine access to credit for rural small scale farmers. Specifically, the study identified forms of financial markets used by the small scale farmers. Secondly, it identified the credit delivery methods offered by the financial markets. Third, it analyzed factors that influence small scale farmers' access to credit and examined the effect of access to credit on small scale farmers' livelihood. The study covered 304 small scale farmers in Mufindi, Iringa Rural District, Moshi Rural District and Rombo Districts in a survey conducted between March and November, 2009. Quantitative techniques were used to analyse the data. The results showed that informal financial markets are dominant in the rural areas. Most of the farmers were found to use friends within their villages as a source of credit. Thus, the most popular credit delivery method in the rural areas was found to be individual lending. Factors found to influence access to credit included, knowledge, attitude, borrowers' transaction costs, house quality, wealth and social capital. Using the marginal probabilities, social capital was found to have the highest influence on access to credit in rural areas. Non income factors affecting access to credit, such as knowledge, education, attitude and social capital were found to have a positive effect on small scale farmers' livelihood. Based on these findings, it is recommended that interventions on credit programs should focus more on social capital both at household and financial markets levels. However more appropriate efforts should also be put in educating the farmers on the benefits of accessing credit. Lastly, interventions on livelihood improvement should focus more on small scale farmers own capabilities rather than income.

DECLARATION

I, Esther Naiman Towo, do hereby declare to the Senate of Sokoine University of Agriculture that this thesis is my own original work, and has not been submitted nor is it concurrently being submitted for a higher degree award to any other institution.

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DEDICATION

To the Doctors of Kilimanjaro Christian Medical Center (KCMC hospital) for their care, advice and encouragement

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LIST OF ABBREVIATIONS

ACCION	International, Americans for Community Cooperation in Other Nations
BoT	Bank of Tanzania
CARE	Cooperative for Assistance and Relief Everywhere
DA	Development Alternatives
DFID	Department for International Development
ELCT	Evangelical Lutheran Church of Tanzania
FINCA	Foundation for International Community Assistance
FNGOs	Financial Non-Governmental Organizations
Freq.	Frequency
GDP	Gross Domestic Product
HBS	Household Budget Survey
IFAD	Foundation for International Agricultural Development
LDCs	Less Developed Countries
LIH	Life Cycle Hypothesis
LVI	Livelihood Vulnerability Index
MDG	Millennium Development Goals
MFI	Microfinance Institutions
MoA	Ministry of Agriculture and Co-operative Development.
MUCOBA	Mufindi Community Bank
NBC	National Bank of Commerce
NGO	Non-Governmental Organizations
NMB	National Microfinance Bank
NSGRP	National Strategy for Growth and Reduction of Poverty

PCA	Principal Component Analysis
PIH	Permanent Income Hypothesis
Plc	Public Limited Company
PRIDE	Poverty Reduction Initiative Development Enterprise
RFM	Rural Financial Market
RFSP	Rural Financial Services Programme
ROSCAS	Rotating Savings and Credit Associations
SACAS	Savings and Credit Associations
SACCOS	Savings and Credit Cooperative Societies
SEDA	Small Enterprise Development Association
SELF	Small Enterprise Loan Facility
SIDA	Swedish International Development Agency
SOCAT	Social Capital Assessment Tool
TSh	Tanzanian Shillings
UN	United Nation
UNDP	United Nation Development Programme
URT	United Republic of Tanzania
VICOBA	Village Community Bank

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information on Rural Financial Markets

Rural areas in most of the least developed countries (LDCs), like Tanzania, are dominated by small scale producers (Mpangala, 2000). The rural population, which is 70 – 80% of the total population, comprises about 83% of the poor, who rely on small scale agriculture as the main source of income and livelihood (URT, 2009). As a result, poverty is generally regarded as a rural phenomenon (IFAD, 2007).

Most of the challenges that the rural poor have been facing have undermined their development (Temu and Due, 2000). One of the main ones is inadequate financial capital (Msambichaka *et al.*, 2003; Yaron, 2004; Ong, 2006), which has inhibited farmers to invest in more beneficial and economically productive activities (Mallorie, 2002). Some of these beneficial activities that rural people have failed to invest in due to lack of financial capital include education for children, low use of inputs and low adoption of technologies (Ahmed *et al.*, 2007). Thus, lack of financial capital may cause small-scale farmers in rural areas to be trapped in poverty. The easing of this constraint particularly for liquidity-constrained households through increased access to credit could generate pro poor economic growth (Winter-Nelson and Temu, 2005).

Other challenges facing small scale farmers include stiff competition in the markets for agricultural products, unreliable weather conditions and unreliable prices for agricultural products. To date these challenges have not been well addressed, which has contributed to poor performance of the agricultural dependent economies as indicated by Rutasitara (2002) and stagnation in poverty.

To address rural poverty, the Tanzanian government has had deliberate pro poor growth strategies and polices since independence (Binhamer, 1975; Temu, 1994), one of which is by increasing financial liquidity of small scale rural farmers through policies and growth strategies that focus on enabling them to access rural credit (Kimei, 1987; Ndanshau, 1995). In addition, policies that focus on achieving the millennium development goal number one (MDG 1), on eradicating poverty and hunger, encourage developing countries, including Tanzania, to avail financial services to rural dwellers. At the national level, relevant policies and legislations for regulating financial markets include the Tanzania Development Vision 2025 and the National Strategy for Growth and Reduction of Poverty (URT, 2010); the Cooperative Policy (URT, 2002); Cooperative Act (URT, 2003); Microfinance Policy of Tanzania (URT, 2000); and the amendment of the Banking and Financial Institutions Act (URT, 2006).

Other efforts include the introduction of rural finance projects such as Small Enterprise Loan Facility (SELF) and Rural Financial Services Programme (RFSP), which are operating through the Savings and Credit Cooperative Societies (SACCOS) and Savings and Credit Associations (SACAS) and the President-led initiative whereby loans worth TSh. 47.14 billion were advanced to 72 197 entrepreneurs (URT, 2011).

However, in contrast to the period before liberalization, presently there are various types of financial providers in the rural areas (Wangwe and Lwakatare, 2004). The principal providers are still the semi formal financial institutions, such as Savings and Credit Co-operative Societies (SACCOS) and Savings and Credit Associations (SACAS). For example, there were 5277 SACCOS that were registered by the Cooperative Department of the Ministry of Agriculture by December 2010 (MOA, 2010). In addition, Non-

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However, most of these efforts are yet to bear fruits in relation to the objective of serving the poor rural small scale farmers (Diagne and Zeller, 2001; Nagarajan and Meyer, 2005). A large segment of small farmers in Tanzania is yet to access credit; as shown in Table 1. Moreover, the structure and inefficiencies of the cooperatives and the high interest rates on credit and credit ceilings have crowded out the rural sector (Binhamer, 1975). Furthermore, most of the resources have benefited the urban dwellers; for example, it is estimated that of the 20 000 business entrepreneurs that benefited from the President's initiative, more than 70% were from the urban-based (Lusekelo, 2007). Likewise, only 1.7% of the rural population constitutes members of Savings and Credit Cooperative Societies (MOA, 2010). Even in areas where financial markets have good outreach, access to credit by the rural small scale farmers is still limited (Moshi, 2007). Most of the rural areas are still largely dependent on fragile informal traditional systems found among various local communities (Armendariz and Jonathan, 2007).

Table 1: Percentage of households with one or more members participating in financial markets

	Dar es salaam			Other urban areas			Rural areas			Tanzania mainland		
	91/92	00/01	07	91/92	00/01	07	91/92	00/01	07	91/92	00/01	07
Participates in an informal saving group	12.4	7.9	1.8	10.0	6.7	11.2	3.6	2.8	6.3	5.1	3.8	7.8
Took a bank loan last year	6.7	1.1	3.7	2.6	1.0	6.2	0.5	0.4	1.6	1.2	0.6	2.7
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Source: Tanzania HBS (2007).

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It could be surmised from the above discussion that the financial reforms that have been undertaken in Tanzania since 1991 have not brought greater impact in improving access to credit by rural small scale farmers. This raises further concern that probably the major determinants of access to credit have not been well addressed by policy makers and other stakeholders in rural and agricultural development. It indicates that the financial reforms for facilitating access to credit by small scale farmers from financial markets should probably have done more. Thus, there is a need to study the problem further and seek to fully understand what leads to low access to credit for the rural small scale farmers. Hence, this study evaluates the major determinants of access to credit for small scale farmers.

1.2 Problem Statement and Justification

Most policy and research interest regarding rural credit markets revolve around the perception that poor small scale farmers in developing countries lack access to credit (Diagne, 1999). This is because lack of access to credit facilities is believed to have significant negative consequences on the households' productive ventures (Kasirye, 2007).

In Tanzania, several studies have addressed the issue of low access to credit and financial markets in Tanzania. Bee (2007) addressed access to financial services in rural financial markets in Babati District and observed that the demand for financial services for rural households is determined by the household level of poverty, household size, level of education, life cycle needs and local market opportunities. Khalid (2003) examined access to formal and quasi formal credit to smallholder farmers and artisanal fishermen in Zanzibar and found that factors that influenced access to credit included age, gender, education, income levels and degree of awareness on credit availability. Temu (1994) evaluated the strategy adopted to develop Tanzania's rural financial market and

identify its shortcomings and established that factors such as cash income, distance, land and savings account influenced access to credit. Ndanshau (1996) addressed formal and informal finance in the peasant economy and found that borrowing was influenced by peasants' per capita expenditure and size of land. Kashuliza (1994) examined the demand and supply of credit in rural financial markets and found that factors that impede access to credit included the following: limited awareness of the availability of credit facilities, lack of experience in formal credit, inadequate availability of extension services, sex of the credit recipient and lack of use of improved farm implements.

Whereas these studies have addressed most of the factors affecting access to credit in Tanzania's rural setting, they have not been exhaustive. For example, none of these studies has looked into aspects of borrowers' transaction costs and social capital amongst small scale farmers. This study has attempted to add to the understanding of issues on access to credit in rural financial markets, by examining further factors that influence small scale farmers' access to credit in Tanzania. Moreover, in view of its findings, the study informs policy makers and development practitioners on design mechanisms and strategies that are likely to contribute to reversing the circumstances that hinder rural development.

1.3 Objectives of the Study

The main objective is to investigate the factors that determine access to credit by rural small scale farmers.

Specific objectives include the following:

(i) To identify the forms of financial markets used by small scale farmers.

(ii) To examine the credit delivery methods offered by the financial markets

(iii) To analyze the factors that influence small scale farmers' access to credit.

(iv) To examine the effect of access to credit on small scale farmers' livelihoods.

1.4 Research Questions

The study addressed the following research questions:

(i) What are the types of rural financial markets used by rural small scale farmers?

(ii) How do the various types of rural financial markets influence small scale farmers' access to credit?

(iii) What are the credit delivery methods utilized by rural financial markets to facilitate small scale farmers access to credit?

(iv) What are the socio economic characteristics of the small scale farmer that influence access to credit?

(v) How does social capital influence small scale farmers' access to credit?

(vi) How do borrowers transaction cost influence access to credit?

(vii) What are the factors that influence small scale farmers' livelihood with respect to access to credit?

1.5 Organization of the Study

This study is organized as follows. Chapter Two discusses the conceptual and analytical framework for the study; whereas Chapter Three is a presentation of the methodology. Chapter presents and discusses the results and Chapter Five winds up with conclusions and recommendations.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Theoretical Framework for Small Farmers' Access to Credit

This section reviews theories that are related to this study; specifically, these are the consumer utility theory and neo-Keynesian theories, which include the permanent income hypothesis and lifecycle hypothesis.

2.1.1 Consumer utility theory

The consumer utility theory provides for alternative choices made by individuals. Aleskerov and Monjardet (2002) define utility as the satisfaction that each choice provides to the decision maker, who in this respect is the small scale farmer. Thus, utility theory assumes that any decision is made on the basis of the utility maximization principle, in which the best choice is the one that provides the highest utility to the small scale farmer. The consumer who is the small scale farmer decides on how much each of the many different goods and services to consume so as to secure the highest possible level of total utility subject to the available income and the prices of the goods and services. The utility that the small scale farmer gets from selecting a specific choice is measured by a utility function U, which is a mathematical representation of the small scale farmers system of preferences such that: $U(x) > U(y)$, where choice x is preferred over choice y or $U(x) = U(y)$, where choice x is indifferent from choice y.

Regardless of the type of utility function, utility theory assumes that preferences are complete, reflexive and transitive (Belton and Stewart, 2002). The preferences are complete if for any pair of choices x and y, one and only one of the following

conditions are fulfilled: x is preferred to y, y is preferred to x, or x and y are equally preferred. The preferences are said to be reflexive if for any pair of choices x and y are identical, then y is also equally preferred to x. Finally, the preferences are said to be transitive if for any three choices x, y, z such that x is preferred over y, and y is preferred over z, than it is concluded that x is preferred over z. The hypotheses on reflexivity and transitivity imply that the small scale farmer is a rational decision maker.

Small scale farmers are assumed to act rationally, because they will choose between different goods and services so as to maximize total utility. Hence, small scale farmers have to make choices by combining budget constraints and preferences. Small scale farmers are therefore faced with trade offs in their purchasing and investment decisions, since their income is limited and choices are numerous. The limited income and budget constraints necessitate the need for credit. The implication is that the small scale farmer will maximize utility, through access to credit, subject to the factors that constrain them. These factors include socio-economic characteristics, income, savings, social capital and borrowers' transaction costs.

2.2.2 Neo-Keynesian theories

The lifecycle model of Modigliani and Brunberg and the permanent income hypothesis (PIH) of Friedman are at the heart of the theoretical underpinnings for small scale farmers' access to credit (Ndanshau, 1996). The Permanent income hypothesis maintains that a household spends a fixed fraction of their permanent income on consumption, whereby permanent income is defined as the annuity value of lifetime income and wealth; whereas the life cycle theory posits that individuals choose a life time consumption pattern that maximizes their utility subject to their lifetime budget constraint. Like many other people

with low incomes, small scale farmers have a high marginal propensity to consume out of their current income.

With regard to the lifecycle hypothesis, with its focus on current consumption and saving, the implications on small scale farmers with regard to the three stages of the hypothesis are as follows. First, at the early stage, a small scale farmer has minimal access to credit markets. In the second stage, a small scale farmer is able to work, earn adequate income, and be able to borrow and repay credit as well as save for retirement. The third stage is the aging stage, whereby a small scale farmer relies on his or her savings for consumption; but also at this stage, the small scale farmer may be relying on remittances, or may be resource-constrained due to limited avenues.

The theories reflect that farmers' expenditures are determined by their current incomes; however, it is not debatable that small scale farmers are liquidity constrained. They thus need credit to smoothen their consumption and investment, which points to the need to have access to credit from the existing rural financial markets.

2.2 Conceptual Framework for Small Farmers' Access to Credit

The conceptual framework for this study is summarized in Fig. 1. The presented conceptual framework shows the relationship between the variables that influence access to credit by rural small scale farmers in formal, semi-formal and informal rural financial markets. At the core of the conceptual framework is how policies on credit, a stable political environment and socio-economic and cultural environment create a link between small scale farmers and rural financial markets, which are guided by credit mechanisms and institutional capacity. The positive outcome of the process of accessing credit is improved livelihood of small scale farmers, in view of the productiveness that the availed credit enables.

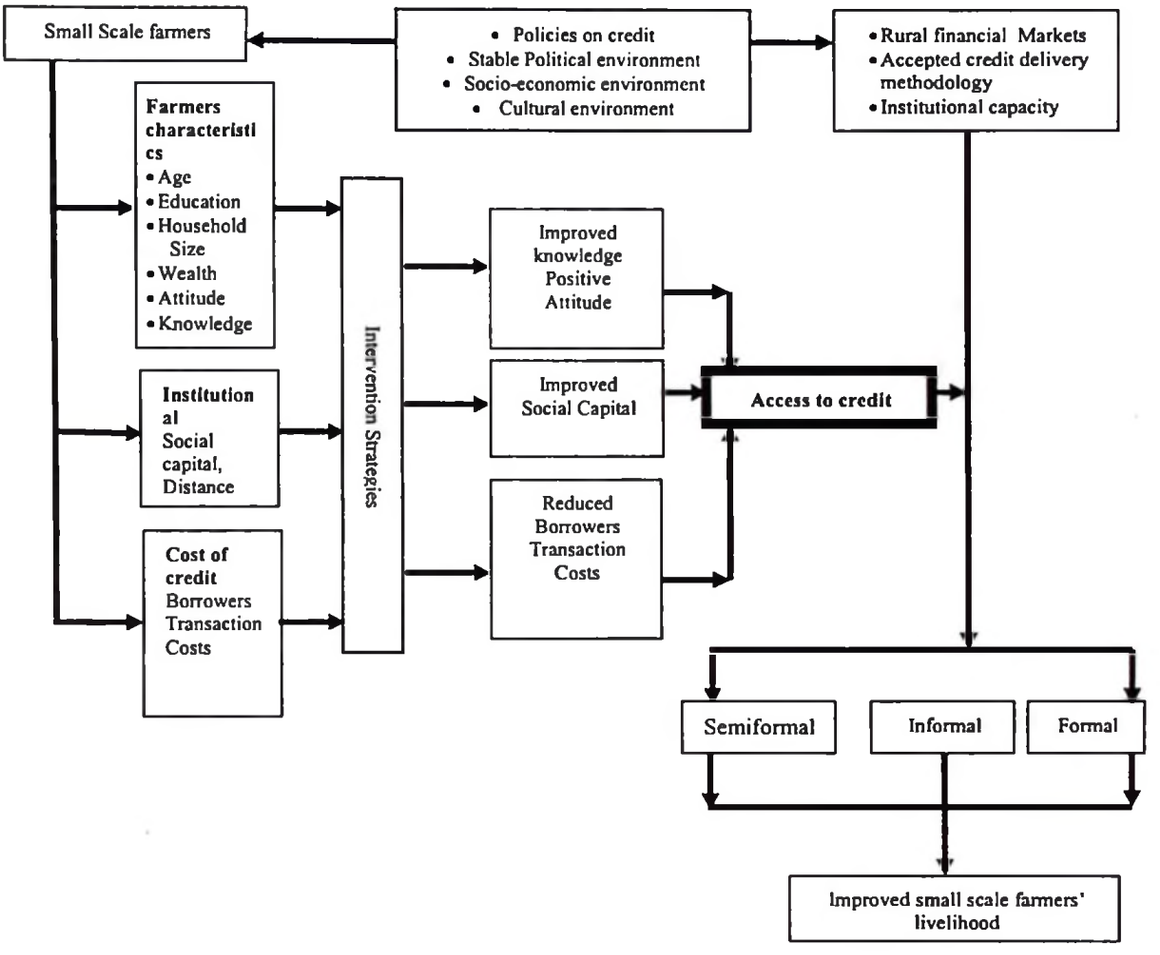

Figure 1: Conceptual framework for access to credit by small scale farmers

2.3 Overview of Core Concepts

This section explains the context in which the core concepts in this study are used; these include the following, rural areas, small scale farmer, credit and its role, social capital, financial markets, and access to credit.

2.3.1 Rural areas

A clear definition does not exist of the word rural, as a result countries have their own way of defining this term and its use varies significantly (Ayalew, 2006). According to UN (2007) there are two perceptions of the term rural, one perspective is that agriculture and

other related or non-urban economic activities characterize the rural areas. The second perspective is that rural, is a geographic (or territorial or spatial or an area) concept, whereby, rural refers to the distance of the household with respect to accessing markets or services and it refers to the density of the settlement in which the household is located. These perceptions, have led to the common definition, that rural areas comprise human settlements with small populations, and the rural space is dominated by farms, forests, water, mountains or deserts (Avila and Gasperin, 2005). In the Tanzanian context rural is defined as geographical areas in which primary production takes place and where populations are found in varying densities (URT, 2001). Hence, in rural areas, populations are found in varying densities, concentrate on primary production and are distanced from accessing services such as social services and financial services which include credit.

Todaro and Smith (2009) support this view, by observing the rural people, are practicing agriculture as the dominant activity. Secondly, they deal with the transformation and marketing of land and forest products and services. Thirdly, they provide cheap labour and are self employed. Fourth, they lack access to basic services such as health, education, transport and financial services, may be because they have low national priority. Fifth they lack political voices and are poor. The rural poor are experiencing these challenges despite, of being the majority in the developing countries and play a key role in development.

2.3.2 Small scale farmer

The literature is awash with debates on who is a small scale farmer. A small scale farmer has been described as a producer at subsistence level (Chayanov, 1966; Ellis, 1996). In the South African context, a small scale farmer was defined by Kirsten and Zyl (1998) as

black, backward, with relatively small plots and producing lower yields than large scale farmers. This definition that is based on plot size has raised many arguments as it is difficult to determine what the appropriate plot size is. Plot size may differ from one region to another or from one country to another. Lund and Price (1998) argue that it is also difficult describe a small scale farmer in terms of output, as large farmers may produce the same output as small scale farmers. Kirsten and Zyl (1998) observe furthermore that the scale of operation of a small farmer is too small to attract the provision of the services he/she needs to be able to significantly increase his/her productivity. Thus, small scale farmers need to be empowered, or else they may have to rely on government assistance for their continued survival. Von Braun (2005) and Poopakdi (1991) go further to define a small scale farmer in terms of resource use, that a small scale farmer rely on natural resources and has limited internal resources, including capital for investment.

From the above definitions, a small scale farmer should be understood as one who produces for both subsistence and the market, but relies heavily on natural resources and has limited internal resources for investment, which affect accessibility of external resources, for example credit. Yet the contribution of small farmers is substantial. In Tanzania, for example, small scale farmers produce 70% of the food consumed in Tanzania (URT, 2009).

2.3.2 Credit and its role

The word credit comes from the Latin word 'credo' meaning to trust (Rahamn, 2005). Credit can be explained as the sale of goods, services and money claims in the present in return for a promise to pay in the future. The promise is based on trust that the debtor

whether a person, or business unit will be able and willing to pay on demand or at some future date. Bhuiyan *et al.* (2012) observe that credit entails the lender, to trust the borrower, with funds to be used by the borrower for his or her purposes to be repaid to the lender with or without interest at a later stage on agreed terms and conditions. Credit can therefore be defined as the power or ability to obtain a resource in monetary or non monetary terms by borrowing in return for a promise to repay later on agreed terms and conditions. For the rural economy, the organization of the activities such as agricultural production is strongly affected by the vagaries of nature and the volatility of commodity markets (Conning and Udry, 2005). In such environments, credit to small scale farmers is not optional but essential. Abu *et al.* (2011) and Yehuala (2007) point out that small scale farmers need credit to be able to make investment and improve agricultural productivity that may facilitate the smoothening of consumption. Secondly, credit enhances technological development. Third, it helps small scale farmers to build their bargaining power. Fourth, it creates employment opportunities. Fifth, it facilitates small scale farmers to make decisions to invest in risky but profitable ventures. Finally, where farmers have been able to access credit they have managed to increase social capital, either through membership in local associations or by participation in collective action.

2.3.3 Social capital

Several studies have considered social capital as an elusive concept (Sabatini, 2005; Putnam, 1995; Tocquevillee, 1984). Social capital has been defined as the sum of the resources, actual or virtual, that accrue to an individual or group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition (Sabatini, 2005). Thus, in this study social capital is contextualized as a resource that is connected with membership in associations/groups, social networks,

collective action, norms, and trust that enable participants to act together more effectively to pursue shared objectives. Like other forms of capital, social capital is productive, making possible the achievements of certain ends, which in its absence would not be possible.

Social capital is heterogeneous and hence categorized into bonding social capital, bridging social capital and linking social capital (World Bank, 2000). Bonding social capital refers to the strong ties connecting family members, neighbours and business associates. Hence it allows for easier flow of information though similarities may limit diversity. Bridging social capital includes the weak ties connecting individuals from distinct ethnic and occupational groups. These are horizontal connections between individuals from similar economic and social status but with different backgrounds. The benefit of such ties is the variety of ideas and information that such connections generate which can consequently increase access to credit. Linking social capital consists of ties between distinct social and economic classes such as between poorer households and those with influence in formal organizations such as political parties and financial markets. This type of link can facilitate the flow of information between the poor small scale farmers and those having positions in the community. Hence, small scale farmers seeking to improve access to credit will depend on the value of social capital which is the number and types of relationships one has and the quality of those relationship.

2.3.4 Financial markets

According to Zeller (2000) there are three types of financial markets, namely, the formal, semiformal and informal markets; these are summarized in Table 1.2 below.

Table 2: Types of financial markets in Tanzania

Type	Registration	Financial markets
Formal	Licensed by the Central Bank (BOT).	Commercial banks, Regional/community banks and financial institutions/non banks
Semi-formal	Legally registered, but not licensed as financial institutions by the central bank	Savings and Credit Cooperative societies, Microfinance NGOs
Informal	Not legally registered at national level (though may belong to a registered Association	Moneylenders, Village Community banks (VICOBA), Savings and credit associations, Rotating savings and credit associations (*kiarano*), religious groups, friends, relatives, clans, neighbour

Source: Adopted from Aryeetey (2001).

2.3.3.1 Formal financial markets in Tanzania

Formal financial markets are financial markets that are licensed and regulated by the central bank. In Tanzania, this role is vested with the Bank of Tanzania (BOT), and operation of these markets is provided under the Banking and Financial Institutions Act of 2006. They include banks and non-banks, that is, commercial banks, specialized banks, microfinance institutions, rural development banks, community banks, pension funds, insurance funds, and others. In Tanzania, these types of financial markets are mainly located in the urban areas (Temu, 1994; Kashuliza, 1994).

Formal financial markets impose competitive interest rates. Given the interest rates, commercial financial markets eliminate the rural small scale farmers. The minimal participation of commercial banks in the rural areas has given rise to semi-formal markets and informal markets that are operating at micro scale in the rural areas. In spite of the proliferation of semi-formal and informal markets, some of the formal markets in Tanzania like commercial banks, for example, the CRDB Bank Plc and community banks

such as the Mufindi Community Bank (MUCOBA) have faced up to the challenge and expanded their outreach to small scale farmers, by providing services either through groups or through Savings and Credit Cooperative Societies (SACCOS) that are located in the rural areas. All these efforts have been geared at increasing access to credit by small scale farmers.

2.3.3.2 Semi-formal financial markets in Tanzania

Semi-formal financial markets provide microfinance services and are governed by sectoral policies and regulations such as the National Microfinance Policy (2000), National Cooperative Development Policy (2002), National Policy on Non Governmental Organisations (2001) and Cooperative Societies Act (2003). Semi-formal financial markets are registered financial institutions, not regulated by the Central Bank but recognized by the Banking and Financial Institutions Act of 2006. They are registered under different authorities. The Bank of Tanzania has however taken a *laissez-faire* approach with regard to these types of financial markets. Two main types of semi-formal financial markets are:

(i) Semi-formal member based financial markets

The most popular member-based semi-formal financial markets in Tanzania are: (1) the Savings and Credit Institutions (SACCOS), which are registered by the Registrar of Cooperatives under the Cooperative Act of 2004 and (2) the Savings and Credit Associations (SACA), which are established at ward level and registered by the Ministry of Home Affairs.

The Grameen Bank model is also another form of a member-based organization that originated in Bangladesh in 1976, which is been replicated in Tanzania. The bank provides loans to poor rural women, based on the principles of mutual solidarity, trust, accountability and participation. The bank lends to a group of five women sharing both the pre-existing and potential social capital. The Grameen Bank Model has been duplicated throughout the world to serve the poor women (Yunus and Jolis, 2003).

(ii) Semi- formal: Financial Non-Governmental Organizations (FNGOs)

The Ministry of Home Affairs registers these FNGOs. These are Non-Governmental organizations formed to provide financial services. Several NGOs of this type that are operating in Tanzania include the Poverty Reduction Initiatives Development Enterprises (PRIDE), Cooperative for assistance and relief every where (CARE) International, Foundation for International Community Assistance (FINCA), Small Enterprise Development Association (SEDA) and those formed by faith based organizations, for example, the Mennonite Church.

There are also village banks that are coordinated by Financial Non Governmental Organizations that are prominent in rural Tanzania. These village banks are now common in many Less Developed Countries, for example in West Africa, Latin America and Uganda in East Africa. In Indonesia, there are, in addition, village rice banks known as *lumbungs*, established by de Wolff in Purwokerto in 1897 (Fruin, 1933).

An improved version of village banks is the Hatch Model that was introduced in 1984 by John Hatch of FINCA (Perez *et al.*, 2011). The clients are the households and they contribute mandatory savings of at least 20% of the loan size. Start-up costs are financed

by donors. These village banks started in South America and spread to Africa by 1992. Village Banks are much smaller than other Micro Finance Institutions (MFIs), like the Grameen Bank; they have low savings, and in consequence the amounts of credit are also small.

2.3.3.3 Informal financial markets in Tanzania

Generally, informal financial markets include market and non market institutions (Porteous, 2004). Informal markets include transactions from individuals such as friends and relatives, and socially distant informal agents, for example, money lenders and deposit keepers. In addition, there are member based groups, such as indigenous savings and credit associations, religious based rotating savings and credit groups, rotating savings and credit associations and village community banks (VICOBA). Informal financial markets are not regulated by the government. Informal credit markets are formed in response to the demand of a distinct clientele and each serve a particular credit niche (Aryeetey, 2008).

It is estimated that the informal sector is larger than the formal and semiformal financial sectors in terms of outreach, since it is accessible to most of the socio-economic groups (Adams and Vogel, 1986). The informal rural financial markets are also flexible in terms of access, conditions, interest rate and repayment periods. Nevertheless, there are member-based groups that impose restrictions and sanctions/penalties for late payments or non attendance of meetings, for example, the Village Community Banks (VICOBA) that are widespread in Tanzania and traditional tribal self help groups such as the *Ifog'ongo* (in the regions of Mwanza and Shinyanga) and *Kiarano* (in Rombo District, Kilimanjaro Region).

2.3.5 Defining access to credit

There are several meanings of the concept of access to credit. Dafhues (2007) explained access to credit as the ability of an individual to borrow from a particular source. Other authors consider a household to have access to credit from a particular source if it is able to borrow from that source, although for a variety of reasons it may not borrow (Diagne and Zeller, 2001; Brata, 2005). This study has adopted this definition of access to credit, which means that small scale farmers are willing to borrow, but due to some reasons, they may not able to borrow the amount they need or may not be able to borrow at all.

2.4 Evolution of Credit Markets in Tanzania

Following Nagarajan and Meyer (2005), this study analyzes the evolution of rural financial markets in Tanzania in the context of the three paradigms; namely, the old paradigm, the microfinance revolution, and the financial systems paradigm. The old paradigm applied in 1960s and 1970s, with interventions specifically focusing on credit for specific credit markets (Nagarajan and Meyer, 2005; von Pishcke *et al.,* 1983). During this period, polices were aimed at the provision of subsidized credit as a means of increasing small scale farmers' produce and reducing poverty (Mpangala, 2000; Bardan, 1991; Yaron, 2004). The old paradigm had several criticisms which included high default rates (Robinson, 2001). However, the old paradigm did not succeed at improving access to credit for small scale farmers, which led to the second paradigm.

The Microfinance Revolution that emerged in the late 1970's was a result of criticisms of the old paradigm. During this period, the government widened the financial sector especially by increasing and expanding branches of the National Bank of Commerce, including also mobile banks (Binhammer, 1975; Kimei, 1982; Ndanshau, 1996). In 1975,

the Villages and *Ujamaa* Villages (Registration, Administration and Designation) Act was enacted, which led to the establishment of Ujamaa villages and dissolution of cooperatives. Credit was channeled through Ujamaa villages, but the major beneficiaries ended up being export farmers in the regions and progressive farmers (Kashuliza, 1994; Ndanshau, 1996; Temu *et al.,* 2001; Msambichaka *et al.,* 2003).

The third paradigm, the financial systems paradigm, drew lessons from the two earlier paradigms. This paradigm started in the mid-1980s and had gained momentum by the mid-1990s, a period that was characterized by major financial sector reforms. The system is based on the financial systems' approach, which uses marketing principles to deliver financial services. This new paradigm enhanced the establishment of privately managed financial markets both in the urban and the rural areas. These institutions have been providing microfinance services and macro services to both the urban and rural clientele, as guided by the Banking and Financial Institutions Act of 2006, which provides for the expansion of the financial markets. By 2012, the Tanzanian financial system comprised of one central bank, 32 commercial banks, 17 non-banks or financial institutions (include seven community banks) that do not deal with the receipt of money on current account subject to withdrawal by cheque. Out of these registered financial markets, the National Microfinance Bank (NMB) has the largest network, comprising of 133 branches, followed by CRDB Bank Plc, which has 57 branches (BOT, 2012).

Despite the growth of formal financial markets, it is the microfinance institutions, such as SACCOS and financial NGOs that have a wider coverage of the rural areas. There are an estimated number of 5277 SACCOS spread all over Tanzania with an estimated membership of 912 759 (URT, 2010). The formal financial institutions have smaller

market shares in the rural areas due to high transaction costs and high default risk aversion. Normally, the rural economy is dependent on agriculture and is inherently risky. The high riskiness of the rural sector, coupled with uncertainty of earnings, creates disincentives for formal financial institutions, which in turn affect the lending and investment decisions (Komicha, 2007). Inappropriate government interventions in providing legal property and financial frameworks for facilitating rural financial markets exacerbate such disincentives.

2.5 Credit Delivery Method

One of the main functions of rural financial markets is the delivery of credit to small scale farmers. A delivery mechanism can be defined as a bridge between the provider of a service and the recipient of that service. Thus, in rural financial markets, credit delivery is the provision of credit from the suppliers, that is, the rural financial markets, to the recipients, in this case, the small scale farmers. In delivering credit, various methods have been used. Ledgerwood (1999) and Okumu (2007) defined two types of delivery methods, namely, group lending and individual lending; whereas Conning (1999) described three types of credit delivery methodologies, namely, group lending, individual lending and village banking. Furthermore, Otera and Ryne (1994) described four credit delivery methods that is: solidarity group based lending, cooperatives, village banking, and transformation banking. In this study, cooperatives and village banking have been defined as types of financial markets. Hence, the study adopts the credit delivery methodology, which entails group-based lending and individual lending.

2.5.1 Individual credit delivery method

Individual credit delivery method is used by formal, informal and semi-formal financial markets. It involves providing credit directly to the individual. The contract on credit is

between the individual and the respective rural financial market. The individual has to provide collateral, which is defined by the financial market. Collateral is crucial in the self selection process (Kochar, 1997). It is sometimes loosely defined by the financial market so as to take into consideration the reliability of the borrower to repay. Repayments rates in individual lending also depend on the collateral offered and the incentives offered to the staff.

Individual credit delivery method is mostly used by formal financial markets, for example by Commercial Banks, such as CRDB Bank Plc, NMB, NBC and Regional Banks, such as Mufindi Community Bank. In addition, individual credit delivery methodologies are also used by SACCOS and semi-informal financial markets, such as Savings and Credit Associations (SACA) and the well organized traditional self help groups known as *Kiarano* in Rombo District. Moreover, the individual credit delivery method is also used by most of the informal sources of credit, including moneylenders, clans, friends, relatives and religious groups. The method may increase the costs of information on the borrower; thereby, it may increase information asymmetry and moral hazard in rural financial markets, which may reduce the chances of small farmers accessing credit.

2.5.2 Group credit delivery method

Group lending or joint liability is the process whereby a group requests for credit from a financial market. Other services like training on importance, types of credit offered, repayment and use of credit are also provided through the group. The contract is between the financial market and the group. The collateral is provided by group members and repayment and use of credit is monitored within the group. The provision of credit through groups has been widely used by micro-finance institutions, for example, by

Foundation for International Community Assistance (FINCA), Cooperative for Assistance and Relief Everywhere (CARE) International, Americans for Community Cooperation in other Nations (ACCION) International and the Grameen Bank. Group based lending is expected to ensure smooth operations of credit delivery and repayment amongst the rural poor who could not access credit individually. Furthermore, the rural poor small scale farmers do not have the ability to provide collateral. In addition, the poor farmers are known to be risk averse and are prone to any hazards. Thus, probably what is required within the group is high level of trust between the members.

The group delivery method constitutes two major approaches. These approaches are the community based approach and the solidarity group lending approach (Yunus, 2002; Morduch, 1999; Prescott, 1997). The community based approach usually has a goal of eventual independence of the borrower group from the lending financial market. The financial market develops the financial management capacity of the group so that the group can become an independent financial market. In Tanzania, this system is used by the Village Community Banks (VICOBA). The second approach is the solidarity group lending approach, whereby the provider of credit does not expect the group to grow into or an independent financial market. The most famous solidarity group credit delivery methodology is the Grameen Bank. Currently known as the Grameen Classic System (GCS), it was founded by Mohammed Yunus in Bangladesh in 1976. This system has now spread worldwide, and it is used by other micro-lending institutions such as CARE International, ACCION International, FINCA and PRIDE Tanzania.

Group lending probably has advantages over individual credit delivery in that it reduces costs of screening and monitoring for credit. It has been observed that group lending can

be a disadvantage to the poor when group members are required to pay for those who default from the group. In addition, the short duration to repay credit that does not consider the farming systems has been considered unfavorable. These aspects tend reduce chances of access to credit for the small scale farmers. Probably such conditions have led to small scale farmers to resort to informal financial markets.

2.6 Characteristics of Rural Financial Markets

The overall function of rural financial markets is to administer the flow of funds from the surplus households to the deficit households. The rural financial markets transform the illiquid claims held by small scale farmers into more liquid claims that can be transferred to less informed small scale farmers. Turvey *et al.* (2010) found that in informal financial markets, the flow of funds is not based on interest rate alone but also on freeing of capital within a closed community, with a multiplier effect.

Various scholars, for example Besley (1994), argue that the rural financial markets have several main features, which include underdeveloped complementary institutions, poor communication between a rural financial market and borrowers, and lack of insurance markets to mitigate risk. Zeller (1994) goes even further to argue that there are a few collateral security borrowers able to put up physical assets that can serve as collateral; also, the covariance risk and segmented markets' risk of income shocks and lenders portfolio of loans is concentrated on a group of individuals facing common shocks to their income. Therefore, the rural financial markets are characterized by market failures (Yaron, 1994).

A market failure occurs when a competitive market fails to bring about an efficient allocation of credit. It is believed that a frequent cause of market failure is limited

access to credit (Duong and Izumida, 2002). Thus, small scale farmers' households are in areas that are characterized by market failures or the extreme case of market failure, which is the non existence of markets. Factors that may lead to failure of rural financial markets include information, outreach and collateral, consequently affecting negatively the access to credit.

According to Stigliz and Weiss (1981) market information is not costless, and this explains why financial markets which include rural financial markets are imperfect, due to imperfect information. Imperfect information leads to inefficient allocation of credit. It is based on the assumption that lenders have access to all relevant information from potential borrowers. In reality certain limitations keep lenders from extracting all the information they need. These limitations prevent lenders from accurately separating the risky borrowers from the more reliable ones. Risky borrowers will withhold information, while borrowers with lower credit risk will provide more information, to allow lenders to separate them from those representing high risks. This situation characterized here is referred to as one of information asymmetry (Kherallah and Kirsten, 2001 and Besley, 1994).

Stigliz and Weiss (1981) argue that imperfect information bestows lenders screening, incentives and enforcement problems. Since borrowers are heterogeneous in terms of resource endowments, production and consumption, the lender would use adverse selection. Adverse selection is lending to the less risky borrowers. However, if the borrowers are identified, the lender would still have to deal with the problem of moral hazard (Aryeetey and Udry, 1997). According to Robinson (2001), moral hazard refers to "actions of economic agents in maximizing their own utility to the detriment of others,

in situations where they do not bear the full consequences or equivalently, do not enjoy the full benefits of their actions due to uncertainty and incomplete restricted contracts which prevent assignment of full damages (benefits) to the agent responsible." Hence, information as a tool of non price rationing denies access to credit for small scale farmers. Despite denying small scale farmers access to credit, the informal rural financial markets have more information about their clients because they know each other well. Nevertheless, informal financial markets do not have to make sure contracts are enforced, unlike the semiformal and formal financial markets (Hyuha *et al.*, 1993).

2.7 Factors Affecting Access to Credit

2.7.1 Farmers' household characteristics

Several studies on access to credit have found demographic factors like size of the household, dependency ratio, and gender to have a significant effect on credit: (Diagne, 1999; Eihiraika; 1999; Adugna and Heidhues 2000; Rweyemamu *et al.*, 2003). Furthermore, the effect of demographic factors on access to credit has been found to differ geographically (Kashuliza and Kydd, 1998).

Other factors found to have significant effect on farmers' access to credit include education (Schriener, 1997 and Rweyemamu *et al.*, 2003); distance to financial market and limited awareness on the availability of credit facilities (Kashuliza, 1994; Temu, 1994). With regard to the effect of small scale farmers' wealth, studies have used proxies like size of land, value of crops sold, and number of livestock, all of which were found to have a significant effect on access to credit (Schreiner, 1997 and Atieno, 2001). On farm and off farm incomes were found to have a positive influence on access to credit for small scale farmers (Kashuliza and Kydd, 1998; Adugna, 2000; Diagne, 2001; and Vaessan,

2001). Moreover, (Togba, 2009), using the Life cycle hypothesis approach found out that pensioners do not access credit but prefer to use their savings. Focusing on gender and access to credit, Mohamed (2003) and Ishengoma (2004) found that female headed households were more credit constrained than their male counterparts in accessing credit. With respect to age, Mohamed (2003) further found older people to have lower chances of accessing credit than younger ones. Moreover, household events, such as burial, sickness and other ceremonies like weddings were also established to have a positive influence on farmers' access to credit (Adugna and Heidhues, 2000; Vaessan, 2001; Zeller *et al.*, 2001).

2.7.2 Borrowers' transaction costs

Most of the studies on transaction costs in financial markets focus on the lenders' transaction costs. De Gulla (1993) conducted a study on borrowers' transaction costs in Indonesia, and found that the borrowers' transaction cost had a significant effect on the amount of credit requested compared to interest rate. That is, the higher the transactions cost, the lower the amount of loan demanded and vice versa. Nevertheless, Chung (1995) also evidenced that smaller borrower transaction costs in the credit market rather than higher nominal interest rates, played a key role for farmers to access credit.

2.7.3 Social capital variables

Researches based on variables that make up social capital have been conducted both at the household and institutional levels. At the institutional level, Olomola (2000) in Nigeria compared the loan repayment rate, savings mobilization and attending meetings between NGO microfinance groups and autonomous groups. He evidenced that social capital has less impact amongst NGO groups compared to autonomous groups, which implies a level of distrust between lenders and borrowers for NGO groups. Dowla (2005) in Bangladesh

also conducted a study on members of the Grameen Bank and observed that the provision of credit accentuates an existing source of social capital which is the family. He further accounted that the Grameen Bank created trust, norms and networks between its members.

At the household level, Grooteart (1999) conducted a study in Indonesia, noted that households with higher social capital were able to accumulate more wealth, more savings and also to obtain credit. Additionally, Tijani and Ajani (2009) evidenced that households whose members participated in local association or groups had a higher probability of accessing credit than households that had non participants. It was further revealed that households that participated in local associations also participated highly in community collective action and collective decision making in communities (participation in community work and decision on use of community resources such as water and land for grazing). Brata (2005) posited that membership in local associations does not influence the amount of credit borrowed from informal sources. Brata (2005) went further by analysing the social position and access to credit in rural Indonesia, the results showed that elites have more access to credit than non-elites.

Looking at networks as social capital, De Weerdt (2006) and Comola (2007) conducted studies in rural Tanzania, Kagera region. They found that when an agent forms a link, not only do they establish a new contact, but they also gain access to a larger network of the partners' friends and friends of these friends. The importance of social capital is further evidenced by Narayan and Pritchett (1999) in their study on Tanzania, using data from the Tanzania social capital and poverty survey, where they utilized the degree and characteristics of associational activity as a proxy for social capital. They found that social capital for a household is an important determinant of households' income and other

household characteristics, for example, years of schooling. They also posited that households with higher participation in associational activities were more likely to obtain credit for agricultural purposes.

Moreover, Togba (2009) argued that trust has an influence on the choice of microfinance source, and thus there is a need for microfinance programs to create social networks among themselves and between borrowers. This argument is cemented by Okten and Osili (2004) and Anggreani (2009) who found that farmers and lower income urban dwellers with stronger social networks were more likely to access credit than those without networks. Finally, Lawal *et al.* (2009) found out that social capital can go a long way in easing access-to-credit constraints faced by farmers, by improving their membership to associations, savings and decision-making on issues pertaining to microfinance institutions.

2.7.4 Livelihood and access to credit

The concept of livelihood is dynamic though it recognizes planning by rural small scale farmers at household level. Scholars have therefore defined the concept in various contexts. Chambers and Conway (1992) define a livelihood in its simplest sense as a means of gaining a living. However they amplified the definition and alleged that livelihood comprised of capabilities and assets (stores, resources, claims and access). Scoones (1998) further improved the concept and observed that livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. While Ellis (2000) points out that livelihood comprises the assets (natural, physical, human, financial and social capital) the activities, and the access to these (mediated by institutions and social relations) that together determine the living

gained by the individual or household. There have been continuous debates on whether these definitions sufficiently encompass all the relevant considerations of the well-being of the rural households. As a result Scoones (2008) included scale, knowledge, politics and social differences in livelihood. This study will adopt the definition of livelihood as improved by Scoones (2008) as it consider all resources and activities that are relevant to the livelihood of the rural small scale farmer.

The livelihood concept has two crucial terms which include individual capabilities and access. The term, capabilities in livelihood refers to the ability of individuals to realize their potential as human (Chambers, 2001). Ellis (2000) views the term access in livelihood as the rules and social norms that determine the differential ability of people in rural areas to own, control, claim or make use of resources such as land. Additionally, access also includes the benefits people derive from use of services such as education, health, water, electricity and finance. This study shall discuss livelihood in the context of capabilities and access to credit, as a means of improving rural small scale farmers' livelihood, as credit markets influence investment in financial capital at household level.

From the livelihood notion several studies have examined rural livelihoods in the perspective of use and access to resources available. Freeman *et al.* (2003), Ellis and Bahiigwa (2001), Mdoe and Ellis (2003) and Tebe (2008) focused generally on rural livelihood in Kenya, Uganda and Tanzania and West Cameroon respectively. Other studies have examined rural livelihood in terms of agriculture (Takane, 2007; Ellis, 2000). Limited studies have looked on access to specific resources and services in relation to livelihood in the rural areas such as social capital (Marsh, 2003; Narayan and Pritchat,1999), wildlife (Ashley *et al.*, 2002), financial services (Bee, 2007); tourism

(Mbaiwa,2008), gender and land tenure (Owusu, 2008), climate change (Hahn *et al.*, 2009) and mobile phones (Martin and Abott, 2011). Studies that have specifically examined credit and livelihood in rural areas include Escobal (2001), on formal credit in relation to off farm work. Berdegué *et al.* (2001) examined access to credit and self-employment. Finally, Bhuyan (2012) looked at micro-credit products and livelihood in rural areas. These studies have found that factors such as access to land, gender, education, off farm employment, micro-credit products affect rural livelihoods. This study will focus on livelihood in the context of access to credit by taking on board factors such as borrowers transaction costs, social capital, knowledge, attitude, credit delivery methods and socio-economic characteristics of the small scale farmer.

2.7.5 Identified research gap

The reviewed studies have contributed to put in context many interrelated issues on access to credit. This study contributes to this literature by focusing on access to credit for the small scale farmers and rural based financial markets. In addition to analyzing factors influencing access to credit by small scale farmers, the study has examined credit delivery methods offered by the rural financial markets as they relate to credit access and small scale farmers livelihood. It is worth noting that in analyzing access to credit by the small scale rural farmers this study has incorporated additional variables in the context of rural Tanzania, such as social capital and borrowers' transaction costs, which had hereto not been covered in any of the previous studies conducted on rural Tanzania.

2.8 Overview of Methodological Issues

2.8.1 Review of indices of variables

To measure a combined effect of several variables, a number of studies have used the indexing approach (Mwakyambiki, 2006). An index is a variable that is constructed from several individual factors to represent an aggregate effect. In this study, some of the variables modeled to influence access to credit are composed of a number of factors; as well, the dependent variable, access to credit, is a multi-component variable of several factors. Thus, to capture the aggregate effect on a household of several related factors, this study uses the indexing approach. An index of the variable *i*, for household *i*, is constructed as the weighted average of the responses concerning that variable (i.e., the ratio of the sum of weights indicated by household *i* over the responses to the total number of responses). To determine the weights of the factors composing that variable, Principal Component Analysis (PCA) was used. This section addresses some of the methodological issues related to the developing of these indices.

2.8.2 Principal component analysis

Principal Component Analysis (PCA) is a technique that is applied to a given set of variables to find out which variables in the set form coherent subsets that are relatively independent of one another (Kline, 2008). PCA estimates the correlation matrix of the variables, with the main objective being to reduce the dimension of the observations. The correlation matrix has two sets of values, one is the characteristic vector (also known as eigenvector); the other is a set of characteristic roots, the eigenvalues. The larger the eigenvalue, the more the variance is explained by the factor. The advantage of using PCA is that it describes the indices with smaller sets of synthetic variables. Secondly, in regression analysis, it identifies and eliminates multicolinearity (Greene, 1997).

To have a set of appropriate variables for the construction of a related index, only the variables with factor loadings of 0.3 or greater are recommended, which have been followed in this study (Simon, 2006; Kim and Mueller, 1978).

2.8.3 Measurement of variables

2.8.3.1 Access to credit

Researchers have used different measures for access to credit. One of the common measures of access to credit examines whether an individual has borrowed from any source (Kashuliza, 1994; Diagne and Zeller, 2001; Dafhues, 2007). Another measure of access to credit is the maximum amount that a financial market can lend to an individual (Diagne, 1999). Moreover, other researchers have attempted to measure credit access by the amount which an individual has borrowed from a particular source (De Gula, 1993; Ndanshau, 1996; Nguyen, 2007); whereas Temu (1994) measured access to credit by asking respondents if they had a bank account; and Mohamed (2003) measured access to credit by asking respondents if they had applied for credit from formal and semi-formal financial markets.

This study has attempted to add to the measures of access to credit by adopting a broader measure, which is constructed as an index of various factors that determine access to credit as rated differently by the credit beneficiaries. Information for construction of the Credit Access Index was drawn from focus group discussions. How this index and other indices were constructed is discussed further in sub-section 3.5.2.

2.8.3.2 Wealth

Wealth is one of the variables with multiple components, which requires the construction of an index to incorporate the components into a single variable. Filmer and Prichett (2001) estimated wealth levels as determined by asset indicators, using Principal Component Analysis (PCA). In creating a wealth index, the PCA approach has been found to be more advantageous than the approach that is based on the simple count of the household assets because PCA reflects also their relative importance to the household. Hence, it provides a rational approach to a household's wealth, with a single indicator (Howe *et al.,* 2008). In addition PCA transforms qualitative data into quantitative data. This study uses the PCA approach in developing a wealth index, particularly due to its generation of relative weights pertaining to the distribution of household assets. The estimation of relative wealth using PCA is based on the first principal component.

This first Principal component across households has a mean of zero and variance of λ, which corresponds to the largest eigenvalue of the correlation matrix χ. Moreover, in most cases the first principal component Y yield a wealth index. The wealth index can take positive as well as negative values. In this study, all values were dichotomized into 1= Yes or 0 = No to indicate ownership of each household asset.

2.8.3.3 Social capital

In measuring social capital, some studies have gauged it on indirect indicators, for example, crime rates, rates of teenage pregnancy, participation in tertiary education, electoral participation, social position in the community, participation in voluntary associations, the contribution of cooperatives per capita and measures of being civic, such as non littering and charity giving (Putnam, 1993; Grooteart, 1999; Sabatini, 2005).

In a study on social capital in rural Tanzania, Narayan and Pritchett (1999) measured social capital by looking at group membership, characteristics of groups, individual values and attitudes. This study incorporates the following indicators in the measure of social capital: trust in others, trust in leaders, membership in associations, and exchange of information. These indicators were used to develop indices of respective variables, with PCA used to transform the original data. In turn, the indices were used in the construction of a social capital index (Whitely, 2000; Narayan and Vella, 2006; Tijan, 2009). The construction these indices is discussed at length in section 3.5.2.

2.8.3.4 Borrowers' transaction costs

Transaction costs are defined as non-interest expenses incurred by lenders in evaluating, disbursing and collecting credit and by borrowers in applying, processing and getting approval for credit (De Gulla, 1993). The costs by lenders are often associated with the information gathering procedure that is conducted by rural financial markets to determine the borrower's creditworthiness. The borrowers' transaction costs include cash outlay and opportunity cost of time in applying for credit. Opportunity cost of time covers the frequent trips to and from the financial markets and time spent in the financial market premises.

The opportunity cost of time is defined as the cost foregone best alternative to which the time could have been put to use. For this study, the alternative would have been on-farm labour, payable in the form of rural wage. In addition, cash outlay is made up of all the expenses the small scale farmer incurs for transport, application fees and food. It is noteworthy that De Gulla (1993) measured opportunity cost for accessing credit in terms of hours spent at the formal financial market, whereas this study has used the number of days. This is because in the rural areas, the infrastructure is poor and the efficiency of

rural market officials is relatively lower than for formal financial market. As a result, more time is spent in commuting and queuing for the services. Furthermore, it is easy for small scale farmers to estimate time spent in days than in hours.

2.8.3.4 Household disposable income

Household disposable income is the money that households have available for spending and saving after deduction of all the expenses incurred on factors of production, such as land. Disposable income is a sum of net factor and non factor incomes, which derive from factors of production (Diagne *et al.*, 2000). In this study, it is hypothesized to have an influence on access to credit. For scale farmers, household disposable income mainly consists of net factor incomes from farming and livestock keeping, which how it is measured in this study.

2.8.4 Binary regression model

Several approaches have been used to analyze access to credit. The first infers the presence of credit constraints from violations of the assumptions of the life cycle or permanent income hypothesis (Deaton, 1992; Ndanshau, 1996). The second, which is the commonly used approach, uses survey information on households' experiences with loan applications and rejections to classify them as credit constrained or not (Diagne *et al.*, 2000). This method is advantageous in that it enables the identification of households or individuals that are credit constrained and to estimate the related econometric models (Diagne *et al.*, 2000 and Zeller *et al.*, 1996); thus, it is the one that this study has used. Recent studies on household behavior, according to Diagne *et al.* (2000) have used the binary regression models, mainly due to the advantage these models have on analyzing the probability of with and without; given that the consumer has a budget constraint so he/she

has to make a choice. Another advantage of using the probit regression method is that the estimated probabilities will always lie between 1 and 0 (Greene, 1997).

The probit model, like any other binary models has been widely used, especially in econometrics, is estimating data when the dependent variable is qualitative in nature (Kennedy, 1998). The advantage in modelling household behaviour that the probit regression has, rests with the explaining of why particular choices are made and what factors enter into the decision process. These choices can be represented by a dummy variable that takes the value 1 if the variable is chosen and takes the value 0 otherwise. A special feature of the probit model is that the estimated probabilities will always lie between 1 and 0 (Maddala, 1988). The probit model assumes that while it is only the values of 0 and 1 for the variable Y that are observable, there is a latent, unobserved continuous variable Y* that determines the value of Y. The other advantages of the probit model include believable error term distribution as well as realistic probabilities (Hill, Grifits and Lim, 2007).

2.8.5 Marginal effects

The coefficients from the probit model are difficult to interpret because they measure the change in the unobservable y* associated with a change in one of the explanatory variables. This renders the marginal effects more useful in the interpretation, as illustrated below.

$$ME = \frac{\partial P(y_1 = 1)}{\partial x_{ji}} = \frac{\partial F(B_1 + B_2 X_{2i} + B_3 X_{3i} + B_k X_{kii})}{\partial x_{ji}} \quad \text{.....(1)}$$

Where F is the cdf of a standard normal random variable

$$= F(B_1 + B_2X_2 + B_3X_3 + ... + B_kX_K)B_j \quad \text{.....(2)}$$

Where ME is the marginal effect

2.8.6 Access to credit and livelihood

Various frameworks have been used in analyzing rural livelihoods at both research and program implementation level. The most popular framework is the 'five asset pentagon' and the use of the 'capitals' metaphor (Krantz, 2001). An improvement of this analysis was the sustainable livelihoods framework by the Department for International Development (DFID) that focus on five assets; human capital, financial capital, natural capital, social capital and physical capital and choice on combination of these assets as diversified strategies to attain livelihood (Solesbury, 2003). The DFID sustainable livelihood framework has widely been adopted by organizations to suit their programs (Rodríguez and Vázquez, 2011). For example, CARE International since 1994 has used the Household Livelihood Security Framework that elaborates several components that include nutritional security, health security, shelter security, water and sanitation security, education security, community participation, gender equity and access to institutions. Furthermore the United Nation Development Program (UNDP) defines assets in terms of natural, political, physical and social, human and economic.

In addition, the Foundation for International Agricultural Development (IFAD), Development Alternatives (DA) and Swedish International development Agency (SIDA) have also made a modification on the framework to be applicable for its programs (Krantz, 2001). The sustainable livelihood framework approach is disadvantageous in a number of ways. First it cannot clearly indicate how to identify the poor and secondly, inequalities of power and conflicts of interest are not sufficiently acknowledged, either within local communities themselves or between communities.

Following the criticisms and the importance of the livelihood framework scholars have measured livelihood by using different methods. Most scholars have used the five assets on the sustainable livelihood framework, which include human capital, financial capital, natural capital, social capital and physical capita (Bhuyan *et al.*, 2012; Bee, 2007; Murkhejee *et al.,* 2002). Use of qualitative techniques such as such wealth ranking, livelihood trajectories, focus group discussions and life histories are popular in analyzing livelihood at household level (Lekshm *et al.*, 2008). Few studies have used quantitative techniques in measuring and analyzing livelihood, these include, Akter and Rahman (2012) and Lindenberg (2002) who used livelihood security index, while (Hahn *et al.,* 2009) developed a livelihood vulnerability index (LVI). Owusu (2008) utilized a logistic regression and measured livelihood in terms of income earned from farming. This study will use the access to credit index as a measure of livelihood for small scale farmers. The independent two sample t test will be used to test the significance of selected single coefficients of economic interest in relation to livelihood. The t test has been utilized because of its control for pre-existing individual differences between samples that can be tested by using only one sample (Hill *et al.,* 2007).

CHAPTER THREE

3.0 METHODOLOGY

3.1 The Study Area

The study covered Rombo and Moshi Rural districts in Kilimanjaro Region and Iringa rural and Mufindi districts in Iringa Region, as shown in Fig. 2. These regions were chosen because of the following reasons. First, is the existence of highly commercialised agricultural activities practised by the small scale farmers that demand capital; second, compared to other regions, these regions have a wider coverage of government intervention credit programs, such as SELF and RFSP (URT, 2008).

3.1.1 Rombo District

Rombo District is one of the six administrative districts in Kilimanjaro Region, which are shown in Fig. 1. The district covers an area of 1440 square kilometres, out of which 44 114 hectares are suitable for cultivation and 38 104 hectares are covered by forests, whereas 16 692 hectares are cultivated (URT, 2008). Rombo district has a population of 246 479, according to the National Population of Census of 2002, whereby 116 859 were male and 129 620 were female. Given the annual growth rate of 1.4 %, the population of 2010 is estimated to be 279 342. Estimated GDP per capita in 2008 was TSh.120 000. The main economic activities are farming and animal husbandry, which are practiced at subsistence level. The average size of land owned by households is between 0.25-1 acres. Households rely on agriculture as the major source of income; though the land is continuing to lose its fertility and the size of land for farming is decreasing over time probably die to increased population. Crops grown on the highland and middle zones are coffee, bananas, maize, beans, potatoes and vegetables. Livestock kept include traditional

and dairy cows, traditional and dairy goats, sheep, pigs and poultry. In addition, fruits such as avocadoes and mangoes are grown. The people of Rombo rely on formal, semi-formal and informal financial markets to access credit. There are two branches of the National Microfinance Bank (NMB), which are located at the district headquarters and at Tarakea Town near the border with Kenya. Also, the district has sixteen (16) Savings and Credit Cooperative Societies that are located in most of the wards. The popular informal financial market is the member based *kiarona,* which is embedded in the culture of the Chagga people, the most populous inhabitants of Rombo District. Government directed financial services programs such as SELF and RFSP exist. However, notwithstanding the existence of these financial markets and programmes, access to credit is still low.

3.1.2 Moshi Rural District

Moshi Rural District is also one of the districts of Kilimanjaro Region, shown also in Fig. 2. The district covers an area of 1 713sq.km of which 108 389 hectares (which is equivalent to 87.2 % of the arable land) is under cultivation (URT 2008). In 2009, the district had an estimated population of 414 760, at an estimated growth rate of 1.1 % per annum (URT, 2008). The population density is estimated to be 242 people per sq km. The district is marked with a mountainous topography on the northern part, which forms Mt. Kilimanjaro, while on the southern part are the lowlands. Economically, the per capita income in 2010 was estimated to be TSh 345 673. In Moshi district land is the major asset, as 98% of the total population of the district depend on it. The major cash crop grown is coffee, whereas other crops include banana, rice and maize.

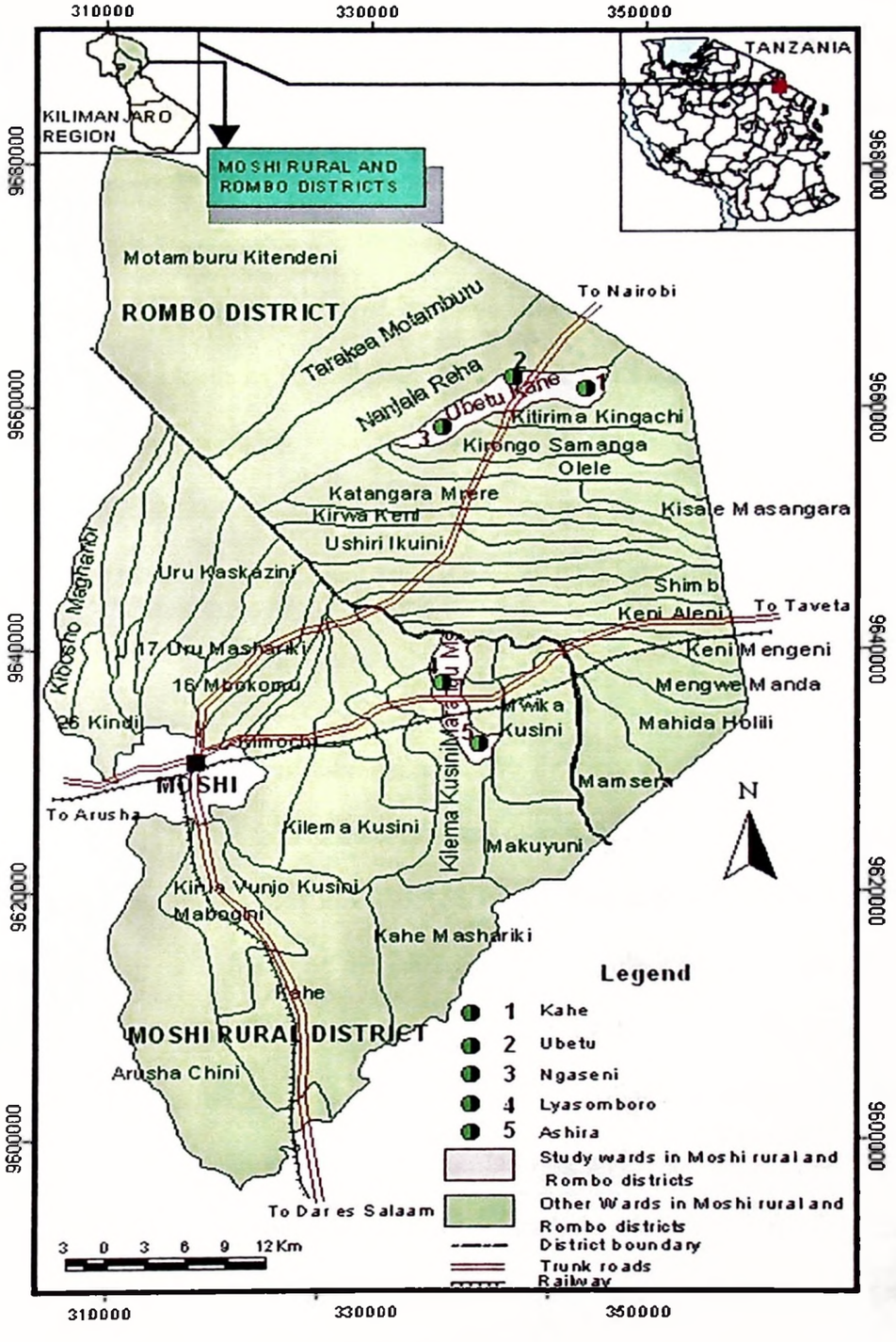

Figure 2: Map showing study areas at Moshi Rural and Rombo Districts

Other activities practiced by the small scale farmers include tourist services (being in the vicinity of Mt. Kilimanjaro), fishing and small business. The small-scale farmers in the district can access credit from a variety of financial markets. These sources include semi-formal rural financial markets (such as SACCOS and a financial non-governmental organisation known as BRAC) and Bank Imani, a group lending service which is offered by the Evangelical Lutheran Church of Tanzania (ELCT). Formal services are availed by a commercial bank known as CRDB Bank Plc, which is located in Marangu East Ward. Informal services available include friends, ROSCAS, moneylenders, religious communities (*Jumuiya)*, relatives, and village community banks (VICOBA) that have been formed through the Evangelical Lutheran Church of Tanzania (ELCT).

3.1.3 Iringa Rural District

Iringa Rural District is one of the administrative districts of Iringa Region as shown in Fig. 3. The district has an area of 20 576 sq km of which, only 9 857.5 sq km is habitable (URT 2008). The district also has 480 158 hectares of arable land but only 34.1% is utilized for agriculture. Based on the 2002 National Population Census the district had a population of 266 444 people. Given the population growth rate of 1.3%, the population of 2010 is estimated to be 295 448 people. About 95% of the working population in the district are small scale farmers, depending on farming and livestock keeping as the major source of income. Other activities in the district include tourist services, fishing, forestry, mining and trading. Crops grown in the area include maize, sunflower, beans groundnuts, potatoes and tomatoes. Semi-formal and informal financial markets serve the entire population. Informal sources include, ROSCAS, friends, neighbours, relatives and moneylenders. Semi formal sources available include 26 SACCOS that serve 3907 members, NGOs such as CARE International and PRIDE.

3.1.4 Mufindi District

Mufindi is one of the eight districts of Iringa Region, as shown in Fig. 3. Mufindi is located 80 km south of the regional capital (URT, 2008). The district has an area of 7123 sq km and 95% of that area is arable. However, the area under cultivation is 19.9%. According to the 2002 National Housing and Population Census the Mufindi district had a population of 282 071 people, with a growth rate of 1.5% (URT, 2008). Given the growth rate of 1.5%, the district was estimated to have a population of 312 869 by the year 2008, of which 150 581 were males and females were 162 487. The population in 2010 was estimated to be 327 160. The district is estimated to have the population density of 46 persons per sq km. The major economic activity of the households in Mufindi District is agriculture. The leading crop is maize that is both a food and cash crop, followed by beans and potatoes that are also food and cash crops. Other food crops grown are wheat, sunflower, groundnuts and green peas (*njegere*). Cash crops include pyrethrum, tea, coffee, sunflower and paprika. Livestock keeping is the third important activity in Mufindi district.

Livestock kept include pigs, cattle, sheep and chicken. The district has formal, semiformal and informal financial markets that provide services to small scale farmers and other agents. Formal financial markets include a commercial bank, the National Microfinance Bank (NMB) and a regional bank namely, the Mufindi Community Bank that is located at the district headquarters in Mafinga Ward. Mufindi Community Bank provides services to small scale farmers in the whole district through groups. There are 48 SACCOS that serve 13 961 members who are spread in all the wards. PRIDE and FINCA provide financial services to clients who are close to the district headquarters, which is mainly Mafinga ward. The informal sources of financial services include friends, relatives, neighbours and ROSCAS.

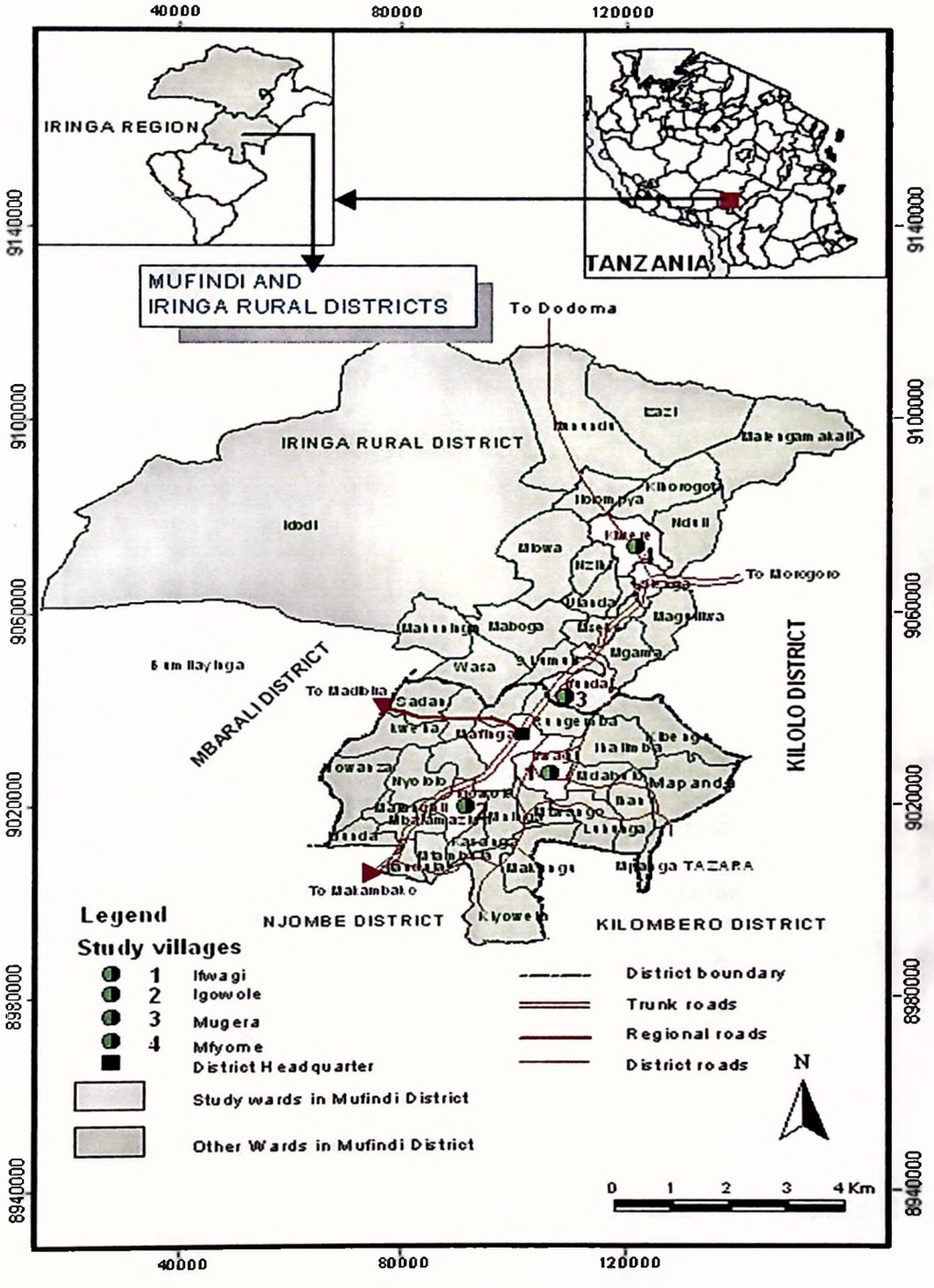

Figure 3: Map showing study areas at Iringa Rural and Mufindi Districts

3.2 Research Design

A cross-sectional study research design was employed. Cross sectional research is a survey based research that establishes variability between cases and allows the examining of possible relationships between variables (Bryman, 2004; Kothari, 2004; Saunders *et al.*, 2003). The cross section research design was utilized also because there is common acceptance that factors determining access, conditions for access to credit and processes of obtaining credit from rural financial markets do not change within a short time. For this reason cross section research design was considered to be more conducive compared to the most expensive time series research method.

3.3 Sampling

3.3.1 Selection of sample Districts

The districts covered in the survey, that is Rombo, Moshi Rural, Iringa Rural and Mufindi were selected purposively. These districts were selected because of the interventions by the Government, financial NGOs and religious institutions on outreach and access to financial markets, type of financial markets available and economic activities conducted by the small scale farmers. These districts therefore represent other districts with similar characteristics in the region.

3.3.2 Selection of sample villages

The key informants, who included district cooperative officers, ward leaders and ten-cell (*mitaa)* leaders assisted in the identification of wards and villages to be covered in the study for each district as follows.

In Mufindi District, the study covered two wards namely Igowole in Kasanga Division and Mafinga in Ifwagi Division. These wards were selected purposively because of the type of financial services available and economic activities conducted by the small scale farmers. Thereafter, three villages were randomly selected namely, Igowole from Igowole Ward, Nzivi and Ndolezi from Mafinga Ward. These villages were randomly selected because the villages in the respective wards were assumed to have the same socio-economic characteristics. However, in Iringa Rural District, the study covered Kalenga and Kiponzera Divisions, which were randomly selected amongst the divisions. Kiwere Ward and Ifunda Ward were then randomly selected from the two divisions, respectively, as it was assumed that they had the same socio economic characteristics as other wards. Finally, the villages of Kiwere, Mugera, Mfyome and Ifunda were randomly selected from the wards.

Furthermore in Moshi Rural District, Vunjo East Division was randomly selected for the survey amongst the five divisions. Thereafter, Marangu East Ward was selected amongst the wards in the division, because it was assumed to have the same social and economic characteristics with other wards in the division. Following this assumption, three villages were purposively selected from this ward, namely; Lyasomboro and Ashira because they had a high concentration of a variety of rural financial markets. From these villages households were randomly selected.

Finally, in Rombo District the study covered Userri Division which was randomly selected amongst the five divisions. Thereafter Ubetu Kahe Ward was selected randomly amongst the wards in the division, because the social and economic characteristics were the same with other wards in the division. With regard to this assumption, the survey covered three

villages, namely, Kahe, Ubetu and Ngaseni, all of them randomly selected. From these villages; the hamlets (mitaas) were selected randomly since they also had the same economic characteristics.

3.3.3 Selection of small scale farmers

The selection of the small scale farmers involved key informants from the respective districts. The key informants were ward leaders, village leaders and hamlet (*mitaa)* leaders. Prior to selection, the key informants were informed on the meaning of access to credit and small scale farmers. Discussions with key informants facilitated in identifying the types of financial markets that existed in the respective villages. The key informants also assisted in the purposively selecting the male and female heads of households who were small scale farmers. They suggested that the best way of identifying the small scale farmers was from the respective hamlet (*mitaa)* in each village. It was also hinted that the *mitaa* leaders knew households better. The hamlet (*mitaa)* leaders assisted in identifying the two sample frames; that is, female headed households and male headed households. A total of 304 head of households who were small scale farmers were interviewed, with the distribution being Rombo District (113), Moshi Rural District (41), Iringa Rural District (100) and Mufindi District (50).

3.4 The Data

Both primary and secondary data were utilized in the study.

3.4.1 Primary Data

Primary data was collected from key informants, small scale farmers' households and officials of the rural financial markets. First, the pilot study was conducted at regional,

district and village levels in order to test information on the existing rural financial markets and small scale farmers access to credit. For the pilot study, two focus group discussions were conducted, one in Rombo District and another in Iringa Rural District. The focus groups comprised of small scale farmers, village leaders and district officials. Through focus group discussions enabled the researcher to have acceptable statements in the indexes. These indices include the credit access index, knowledge index, attitude index, wealth index and social capital index. Informal discussions were also held with the small scale farmers to improve the definition of borrowers' transaction cost. The pilot study was also used to identify the villages to be covered.

After the preliminary survey, a formal survey was conducted in all the districts covered. The formal survey involved soliciting information on the socio-economic status, rural financial markets and access to credit. Information was gathered from key informants, small scale farmers and identified rural financial markets. This survey was guided by the questionnaires in Appendix 1, 2 and 3. To take the advantage of a common medium of exchange that could be understood by the researchers and the respondents, the questionnaires were translated into *Swahili language.*

3.4.2 Secondary Data

This study collected secondary data from various sources, which included institutions involved with providing financial services, such as PRIDE, FINCA, MUCOBA, CRDB Plc, NMB, SACCOS and the Bank of Tanzania. In addition, background information was collected from the Ministry of Agriculture, Food Security and Cooperatives, as well as from regional, district and ward offices.

3.5 Empirical Models and Data Analysis

This study used quantitative tools of data analyses. According to Bryman (2004) quantitative analyses allows us to describe differences between people in terms of certain characteristics. Additionally, the use of quantitative tools in analyzing the data was chosen so as to facilitate the precise specification of the relationship between the dependent and independent variables under investigation, thereby minimizing subjectivity of judgment (Kealey and Protheroe, 1996). Both simple descriptive statistics and the binary regression model were used; with the aid of computer statistical packages (namely, STATA and SPSS).

3.5.1 Descriptive statistics

The data from small scale farmers and the rural financial markets were initially analysed using simple descriptive statistics, including means, percentages and frequency distributions, the output of which was used to construct graphs, pie charts, means and frequency distribution tables that were used to summarize some results.

3.5.2 Development of indices of variables

In this study, several indices were developed for various factors that influence access to credit, by integrating a set of variables into one variable (Howe *et al.*, 2007). The indices that were developed include, credit access index, attitude index, knowledge index, wealth index, housing quality index and social capital index (constructed as a simple average of trust index, trust leaders index, information index and membership index). To construct an index for a variable, a set of statements/factors that determine the respective variable was developed through discussions with key informants, the focus groups, in the respective areas. These indices were then subjected to Principal Component Analysis (PCA) to

determine the ones that were significant. Statements or factors with factor loadings less than 0.3 were considered not to be significant and were thus left out of the analysis (Kline 2008).

3.5.2.1 Credit access index

A set of 12 statements were developed to encompass the credit access index. These statements included availability of sources of credit, do not know where to borrow, credit application process takes a long time, the maximum amount of credit offered is a limit, difficult to meet the conditions of getting credit, distance is a limitation to source of credit, interest rate on credit is high, collateral is a limiting factor to getting credit, credit application will be rejected, the amount requested for is not the amount of credit you can get, credit approval process takes a long time, credit term offered discourages access to credit. These statements were considered to be a complete set for measuring access to credit, the dependent variable.

The respondents were required to respond on the respective statements as to whether they strongly agree, agree, undecided, disagree, and strongly disagree. These responses were assigned weights, 5 for strongly agree, 4 for agree, 3 for undecided, 2 for disagree and 1 for strongly disagree. The responses were thereafter subjected to Principal Component Analysis for data reduction. The respective weights from the set of statements were added up and divided by the number of statements that remained after data reduction to develop the access index. The access index was used to determine the extent to which a household was credit constrained. A cut-off point was determined, to categorize respondents into those who access credit and those who do not access credit. The households that had access to credit were 171, whereas those without access to credit were 133.

$$ACCESS_i = \left(\frac{\sum_j x_{ij}}{X_m} \right) (i = 1,2,...., x; j = 1,2....., m) \quad \text{.....(3)}$$

Where, $ACCESS_i$ = Credit Access Index of the i^{th} household

x_{ij} = the weight by respondent ***i*** to statement ***j*** on access to credit

X_m = number of statements on access to credit after PCA data reduction

X = total number of responses for use as indicators of access to credit

N = Sample size

3.5.2.2 Attitude index

A set of statements that reflect attitude towards access to credit was developed using the same focus groups that were used in developing the access to credit index and was fine tuned by respondents during the pilot study. Respondents were required in this regard to respond to statements reflecting attitude towards credit as to whether they strongly agree; agree; were undecided; disagree; and strongly disagree. These responses were also assigned weights of 5 for strongly agree, 4 for agree, 3 for undecided, 2 for disagree and1 for strongly disagree. The responses were thereafter subjected to Principal Factor Analysis for data reduction. The attitude index was computed for each respondent as the sum of weights by the respondent for respective statements divided by number of statements used to reflect attitude of respondents towards access to credit after data reduction. The attitude index was calculated as follows:-

$$AI_i = \left(\frac{\sum_j x_{ij}}{X_m} \right) (i = 1,2,....,x; j = 1,2.....,m) \quad \text{..... (4)}$$

Where, AI_i = Attitude Index of the i^{th} household

x_{ij} = the weight by respondent ***i*** to statement ***j*** on attitude towards credit

X_m = number of statements on attitude to credit after PCA data reduction

X = total number of responses for use as indicators of attitude

N = Sample size

3.5.2.3 Knowledge index

Statements based on the knowledge about credit access were developed also with the assistance of key informants who were either participants or non participants in the rural financial market. This set of statements was also refined by respondents during the pilot study. In the main survey, respondents were asked to respond to statements based on knowledge about credit access as to whether they strongly agree, were undecided, disagree, and strongly disagree. The responses were also assigned weights of 5 for strongly agree, 4 for agree, 3 for undecided, 2 for disagree and 1 for strongly disagree as before and subjected similarly to Principal Component Analysis for data reduction. As was the case for the above indices, the weights on respective statements on knowledge on credit access were summed up and divided by the number of statements that remained after data reduction to develop the knowledge index, which is computed as follows:

$$KI_i = \left(\frac{\sum_j x_{ij}}{X_m} \right) (i = 1,2,....,x; j = 1,2.....,m) \quad \text{.....(5)}$$

Where, KI_I = Knowledge Index of the i^{th} household

x_{ij} = the weight by respondent *i* to statement *j* on knowledge about credit

X_m = number of statements on knowledge on credit after data reduction

X = total number of responses for use as indicators of knowledge about access to credit

N = Sample size

3.5.2.4 Wealth index

The Wealth Index was computed from the assets of the households; which were taken to include housing status, durable assets and livestock. The key informants in the study areas assisted in identifying these household assets as indicators of wealth. It was further observed that livestock is considered as primary among the assets of a household. A crucial assumption for the analysis (and it is just that – an assumption) is that household long-run wealth explains the maximum variance (and covariance) in the asset variables. The estimation of relative wealth using PCA is based on the first principal component.

The wealth index of household *i* is the linear combination of

$$y_1 = a_1\left(\frac{x_1 - \bar{x}_1}{s_1}\right) + a_2\left(\frac{x_2 - \bar{x}_2}{s_2}\right) + \ldots a_k\left(\frac{x_k - \bar{x}_k}{s_k}\right) \quad \ldots\ldots(6)$$

Where $\bar{x}_i$ and s_i are mean and standard deviation of asset x_i and a_i represent the weight for each variable x_i of the first principal component of wealth items.

Factor scores less than 0.3 were not taken into account because they were considered to be insignificant.

3.5.2.5 House quality index

The House Quality Index was developed based on the type of roof, type of floor, type of wall of a house for the household. In addition, utilities used by the household such as water supply, electricity and installation of a solar system were included. Due to the nature of responses, the formula used for computing the Wealth Index was adopted. Hence, the index was computed as follows:-

$$y_1 = a_1\left(\frac{x_1 - \bar{x}_1}{s_1}\right) + a_2\left(\frac{x_2 - \bar{x}_2}{s_2}\right) + \ldots a_k\left(\frac{x_k - \bar{x}_k}{s_k}\right) \quad \ldots\ldots(7)$$

Where $\bar{x}_i$ and s_i are mean and standard deviation of asset x_i and a_i represent the weight for each variable x_i of the first principal component of items for house quality.

3.5.2.6 Social capital index

A set of questions for computing the Social Capital Index were developed. The social capital assessment tool (SOCAT) was used as guide to set the questions (Grootaert and van Bastelar, 2002). The questions were adopted to suit the topic and survey areas and were formed with the assistance of key informants, which were refined from the pilot study. In general, these questions were based on trust of different groups of people, trust of leadership, networks, and membership/participation in groups, and participation in collective community activities, and the rural financial market that they trusted highly.

However, the set of statements on social capital were categorized into sub-sets of statements, with which separate indices were developed. These indices were aggregated to give an aggregate measure of the Social Capital Index. The subset of indices for computation of the aggregated Social Capital Index includes, Trust Index, Trust Leaders Index, Information Index, and Membership Index.

To compute every one of these indices, respondents were asked, as in previous cases, to respond to statements related to every one of the factors as to whether they strongly agree, agree, were undecided, disagree, and strongly disagree with the statement. As is the case of other indices computed in a similar way, weights were assigned similarly as follows: 5 for strongly agree, 4 for agree, 3 for undecided, 2 for disagree and 1 for strongly disagree, and subjected also to Principal Component Analysis for data reduction. For each respondent, the sum of weights on respective statements were added up and divided by the number of statements in that particular subset that remained after data reduction.

Hence, the indices were computed as follows:

(i) Trust index

Statements for construction of the Trust Index asked respondents to evaluate whether they trust different type/groups of people available in the respective communities which included family members, people from same ethnic group, people from other ethnic groups, people in the same rural financial market, shopkeepers, ward and village officials, police, teachers, nurses and doctors, staff of various rural financial markets, and people who belong to the same religion/dominion. Moreover, the assessment included their trust of village committees, and whether one could get assistance from people within the village or outside the village. Hence the Trust Index was computed as:

$$TI_i = \left(\frac{\sum_j x_{ij}}{X_m} \right) (i = 1,2,....,x; j = 1,2.....,m) \quad \text{.....(8)}$$

Where, TI_i = Trust Index of the i^{th} household

x_{ij} = the weight by respondent ***i*** to statement ***j*** about their trust

X_m = number of statements on trust after data reduction

X = total number of responses for use as indicators of trust

N = Sample size

(ii) Trust leaders index

Statements for construction of the Trust Leaders Index asked respondents to evaluate whether they trust particular leaders and their leadership approaches. Leaders considered were ward, village and *mitaa* chairpersons, religious leaders, and clan leaders; councilors, and leaders of rural financial markets and informal groups. The Trust Leaders Index was thus computed as:

$$TL_i = \left(\frac{\sum_j x_{ij}}{X_m} \right) (i = 1,2,\ldots, x; j = 1,2\ldots, m) \quad \ldots\ldots(9)$$

Where, TL_i = Trust Leaders Index of the i^{th} household

x_{ij} = the weight by respondent *i* to statement *j* about trusting the leaders

X_m = number of statements on trusting leaders after data reduction

X = total number of responses for use as indicators of trust in leadership

N = Sample size

(iii) Information index

According to key informants for the study, existing sources of information that are used by small scale farmers include radios, clan meetings, village meetings, markets places, mobile phones, places of worship and political campaigns and other political meetings. The Information Index seeks to determine the extent to which a household uses the sources of information available. This index is computed similarly as:

$$II_i = \left(\frac{\sum_j x_{ij}}{X_m} \right) (i = 1,2,\ldots,x; j = 1,2\ldots,m) \quad \ldots\ldots(10)$$

Where, II_i = Information Index of the i^{th} household

x_{ij} = the weight by respondent *i* to statement *j* about information sources

X_m = number of statements on information sources after data reduction

X = number of responses for use as indicators of information sources

N = Sample size

(iv) Membership index

Respondents were requested to identify groups in the community in which members of households participated in. All responses were considered as single values that were dichotomized as follows: Yes response =1 and No response=0; these were treated as weights, whereby the former response indicates membership or participation of a household head (member) in a group. The groups included the following: Cooperative society, financial NGO, women group, political groups, village committees, ward committees, religious group, religious *jumuiya,* saving and credit cooperative societies, informal rural financial market, burial groups and self help groups. The Membership index was constructed, based on the count on the weighted average of the responses. The membership index determined the extent to which the respective households participated in groups/organizations/ associations. The formula used was the same as before, except the definitions of the variables differ slightly:

$$MI_i = \left(\frac{\sum_j x_{ij}}{X_m} \right) (i = 1,2,....,x; j = 1,2.....,m) \quad \text{.....(11)}$$

Where, MI_i = Information Index of the i^{th} household

x_{ij} = the weight (0 or 1) by household ***i*** of membership in group ***j***

X_m = total number of available membership groups

N = Sample size

(v) Social capital index

This index was constructed to measure the aggregate level of social capital for the respective respondents. The Aggregate Social Capital Index is computed as the average of the indices for measuring different aspects of social capital that were included in social capital assessment, namely, Trust Index, Trust Leaders Index, Membership Index,

and Information index. These categories were regarded as different indices; hence,

$$SCI_i = \left(\frac{\sum_j sci_{ij}}{X_m} \right) (j = 1,2.....,m) \quad \text{.....(12)}$$

Where SCI_i = Social Capital Index of the ith household

sci_{ij} = a Component index *j* of social capita for household *i* (e.g., TI)

X_n = total number of component indices constructed.

N = Sample size

3.5.3 Borrowers transaction costs

As defined in section 2.7.3, borrowers' transaction costs cover expenses that a borrower incurs to get credit, excluding interest payment, which include the cash outlays and opportunity cost of time of the borrower. In this study, the information with regard to borrowers' transaction costs was obtained from the small scale farmers interviewed during the preliminary survey. The cash outlay included all the expenses that the small scale farmers incurred to receive credit. These expenses included, transport expenses, credit application fees, training fees, required minimum level of savings, food and local brew (where applicable). However, in determining the opportunity cost of time, the small scale farmers preferred to use number of days instead of hours. Therefore, the opportunity cost of time in real terms was the number of days taken to and from the financial market until an individual receives credit. The number of days taken was multiplied by the opportunity cost of time in money terms, which was the rural money wage per day. During the survey the rural money wage per day was TSh. 3000. Therefore, the borrowers transaction costs were calculated as follows:-

$$BTC_i = OCT_i + CO_i \quad \text{..... (13)}$$

Where: BTC_i = Borrower's transaction costs incurred by the head of household i

OCT = Opportunity cost of time that includes the number of days the head of household i goes to and from the financial market multiplied by the rural real wage of TSh. 3 000.

CO_i = Cash outlay by the head of household i, which includes all the expenses incurred by the head of household i to apply for and receive credit.

3.5.4 Household disposable income

Household disposable income included net factor and non factor income. The factor income derived from factors of production, in this case was land. It includes net factor income from factors of production, hence, from crop and livestock production Thus, in this study factor income was calculated by taking the sum of net income from crop production, net income from livestock production, wages and income earned from land that is rented out, less expenses paid to land rented in and income from self employment. Non factor income included income from remittances, and cash savings.

3.5.6 Specification of the model

The probit model was used to examine whether small scale farmers had access to credit or not. Access to credit was the dependent variable, which was used to analyze farmers' decisions in accessing credit. Access to credit was observed as 1 if small scale farmers had access to credit and 0, otherwise. The model was specified as follows.

$$ACCESS = B_0 + B_1 AGE + B_2 HHSIZE + B_3 GEND + B_4 EDUC + B_5 LAND + B_6 HDI + B_7 WEA + B_8 CHOUT + B_9 ATTIT + B_{10} KNOW + B_{11} RFMSAV + B_{12} HSAV + B_{13} BTC + B_{14} SC + u \quad \ldots\ldots (14)$$

Where:-

ACCESS	=	1 if the i^{th} score value of the access index is above the cut-off point, 0 otherwise
AGE	=	Age of head of household in Years
HHSIZE	=	Total number of household members of the i^{th} household
GEND	=	Sex of the i^{th} head of household
EDUC	=	Years of schooling of the i^{th} head of household
LAND	=	total size of land owned by i^{th} household
HDI	=	Disposable income of the i^{th} household
WEA	=	Amount of wealth owned by i^{th} household
CHDOUT	=	Number of children from i^{th} household residing out of village
ATTI	=	1 if the i^{th} head of household has positive attitude towards credit, 0 otherwise
KNOW	=	1 if the i^{th} head of household has knowledge on credit, 0 otherwise
RFMSAV	=	total savings of i^{th} household in rural financial market
HSAVING	=	total savings of i^{th} household at home
BTC	=	i^{th} household aggregate borrowers' transaction costs for credit from rural financial market
SC	=	1 if the i^{th} score value of the aggregate social capital index is above the cut off point, 0 otherwise

3.5.7 Independent two sample t test

The independent two sample t test was used to test the significance of selected single coefficients of economic interest in relation to livelihood improvement and access to credit. The test was used because the two sample sizes are different and it was assumed

that the variances of the two distributions are equal. The Levine's Test for Equality of Variances was used to test for equal variance. If the variances are equal in both groups then the *P*-value is expected to be greater than 0.05. Using the significant (2-tailed) value in the t test, we can determine whether the correlation is significant the null hypothesis is that the correlation coefficient is zero or closer enough to zero, and we reject this at 5% level if the significance is less than 0.05. The t-test equation is described as follows:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{Var_1}{n_1} + \frac{Var_2}{n_2}}} \quad \text{.....(15)}$$

Where: the upper part of the equation shows the difference of the means of the two groups.

The lower part is the standard error, where

X_1 and X_2 are the means of group one and two respectively

Var_1 and Var_2 are the variances of group 1 and 2

n_1 and n_2 are the number of respondents in group 1 and group 2

3.6 Definition of Explanatory Variables

The definition of the explanatory variables and hypotheses in relation to credit access are summarized in Table 3.

Table 3: Explanatory variables and the hypotheses for access to credit

Explanatory variable	Definition of variable	Unit of measurement	Hypotheses
Age	Age of head of household in Years	Number of years	Positive (+)
Education	Years of schooling of the i^{th} head of household	Number of years of schooling	Positive (+)
Sex	Sex of the i^{th} head of household	Male 1 female 2	Positive (+)
Household size	Total number of household members of the i^{th} household	Number of adults and number of children that belong to the household	Positive (+)
Disposable income	Amount of Disposable income of i^{th} household	TSh.	Positive (+)
Total home savings	total savings of i^{th} household at home	TSh.	Positive (+)
Attitude index	1 if the i^{th} small scale farmer has positive attitude towards on credit, 0 otherwise	Index	Positive (+)
Knowledge	1 if the i^{th} small scale farmer has knowledge on credit, 0 otherwise	Index	Positive (+)
Total financial market savings	total savings of i^{th} farmer in at rural financial market	TSh.	Positive (+)
Land	total size of land owned by i^{th} household	Acres	Positive (+)
Wealth	Amount of wealth owned by i^{th} household	Index	Positive (+)
Distance	Distance of i^{th} household to financial market	kilometres	Positive (+)
Social capital	1 if the i^{th} score value of the social capital index is above the cut off point , 0 otherwise	Index	Positive (+)
Borrowers transaction cost	i^{th} small scale farmer aggregate borrowers' transaction costs for credit incurred in rural financial market	TSh.	Negative (-)
Membership	If member of i^{th} household is a member of any group/association	1=Yes, 0=No	Positive (+)
Trust	1 If i^{th} small scale farmers trust leaders, people in community, leadership approaches, 0 otherwise	Index	Positive (+)
Social position in the community	1 if i^{th} head of household has a social position in the community, 0 if no social position	1=Yes, 0=No	Positive (+)
Information index	Source of information used by the i^{th} head of household	Index	Positive (+)

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Socio-economic Characteristics and Access to Credit

4.1.1 Sex

The study covered a sample of 304 small scale farmers, of which 68% were male headed households and 32% were female headed. As for access to credit, compared 77.4% had access to credit, whereas 22.6% of the households did not have access (Table 4). The percentage of female headed households was smaller than that of male headed households particularly due to cultural factors, whereby in patrilineal societies, like where the study was conducted, women do not own land and also due to customary laws that are based on inheritance of property, such as land (Mckernan *et al.*, 2005).

Table 4: Percentage of sample farmers by sex

Sex	Access (n=171) (%)	No access (n=133) (%)
Male	68.4	77.4
Female	31.6	22.6
Total	100	100

Pearson chi square = 3.0456 Pr = 0.081; Fisher's exact = 0.093

4.1.2 Age

Table 5 shows that the average age for heads of households with access to credit was 47.5 years, whereas it was 43.3years for those with no access. Although, the difference is not very large, it gives an indication that the older the head of the household becomes, the higher the likelihood of having collateral like land and other productive resources that can facilitate them to access credit. In addition, age comes with more experience in farming activities and other productive ventures, which may advantageously contribute in access to credit. This was also found by Kashuliza (1994), who found age to have a significant effect on access to credit, but did not take into consideration the specific age.

Table 5: Category of age groups by mean age of sample households

	Access (n =171)	No access (n=133)
Mean	47.5	43.3
Minimum	21	24
Maximum	88	80
Std. Deviation	12.981	11.727
Age		
21 - 30	7.0	8.3
31- 40	29.2	31.6
41 - 50	25.7	30.1
51 - 60	22.2	18.8

Pearson chi square = 2.3271 Pr = 0.676

4.1.3 Household size

The average size of the household as Table 6 shows differed between those with access to credit (6.0 %) as contrasted to those with no access to credit (6.6%). This could imply that households with smaller sizes have relatively lower expenditures that enable them to access credit.

Table 6: Distribution of household size

	Access to credit (n = 171)		No access to credit (n= 133)	
	Household size	Total children	Household size	Total children
Mean	6.0	4.5	6.6	4.8
Minimum	1.0	1.0	2.0	1.0
Maximum	14.0	12.0	15.0	13.0
Standard Deviation	2.5	2.3	2.4	2.4

4.1.4 Residence of children of family household

Table 7 shows the distribution of children residing at home, within the village and those that are out of the village. It was found that family households that had sons and daughters residing outside the village had the highest response of access to credit, which was 62.8% contrasted to 37.2% of those that had no access to credit. This distribution could be interpreted to indicate the influence of sons and daughters who reside outside the village on access to credit by their respective households. That is to say, sons and daughters that reside out of the village are may be more informed on various issues,

including the importance of credit than those who reside within the village. In addition, they are more likely to provide remittances to their parents that can be used as collateral than those who reside in the village. Furthermore they can encourage their parents to borrow so that they can facilitate repayment.

Table 7: Categories and proportion of children by residence

	No access (n=133) (%)	Access (n =171) (%)	Total (n=304) (%)
Children within village	57.9	42.1	7.9
Children out of village	37.2	62.8	26.9
Children at home	46.3	53.7	50.4

4.1.5 Education

The number of years attended school was taken as a proxy of the level of education of the heads of households, as shown in Table 8. The average years at schooling for heads of households that have access to credit is 7 years, which is higher than 5.7 years of schooling for heads of household with no access to credit. Coupled with this difference in the years of schooling, the influence on access to credit of Education was tested using Pearson Chi square, which indicated that the influence is significant at 1 %, implying that education affects access to credit. Temu (1994) also found that the level of education has an influence on access to credit.

Table 8: Distribution of heads of households by level of education

	Access (n=171)	No access (n=133)
Mean	7.0	5.6
Minimum	0	0
Maximum	20	14
Std. Deviation	3.3	2.9
Years of schooling		
0 years	7.7	16.5
1 - 7 years	69.6	78.2
8 - 14	17.9	5.3
> 15	4.8	0
Total	100	100

Pearson chi square = 20.6568 Pr = 0.000, Fisher's exact = 0.000

4.1.6 Religion

Table 9 shows the relationship between heads of household religion and access to credit. The Pearson chi-square is significant, which indicates that there is an effect of religion on access to credit. This finding may not be surprising in view of the fact that religious organizations were found to be involved in credit access. The possible implication is that networks formed in the rural areas that facilitate access to credit include people who belong mainly to the same religion, whereby the influence of religion creates trust among the members of the group. Furthermore, probably information on development projects focusing on encouraging farmers to access credit finds dissemination routes along religious lines.

Table 9: Percentage of heads of households by religion

Type of religion	Access (n =171) (%)	No access (n =133) (%)
Catholic	59.0	79.6
Protestant	38.0	16.5
Muslim	2.9	3.7
Total	100.0	100.0

Pearson chi square = 16.8875 Pr = 0.000; Fisher's exact = 0.000

4.1.7 Occupation

The occupations of the heads of households and of their spouses are summarized in Table 10. Crop production was found to be the major occupation of the heads of households that had access to credit as well as those who had no access to credit. Moreover, there is a slight difference in the percentages along the occupation lines, which indicates that occupation may not be an influence in accessing credit.

Table 10: Occupation of heads of household

Type of Occupation	No access (n =133) Freq.	%	Access (n = 171) Freq.	%
Crop farming	131	34.0	167	32.0
Livestock farming	108	28.1	150	29.5
Household work	69	17.9	90	17.7
Small business	46	11.9	62	12.2
Day labourer	17	4.4	9	1.8
Salaried worker	5	1.3	19	3.7
Fishing	4	1.0	3	0.6
Craftsmen	3	0.8	5	1.0
Timber harvesting	2	0.5	1	0.2
Mechanic	0	0.0	3	0 .6

NB: Data Based on Multiple responses

4.1.8 Household's durable assets

Durable assets owned by households are considered as indicators of wealth. In case of problems such as illness, shortage of food, and lack of school fees, small scale farmers may sometimes dispose of these assets to meet these needs. Table 11 shows the durable assets owned by the household. It was found that 63.6% of households with mobile phones had access to credit. This indicates that mobile phones may have been used to facilitate the communication related to access credit, including for example, information on credit sources and the processing of credit.

Table 11: Number of durable assets owned

Asset	No access (n = 133) Freq.	Max	%	Access (n =171) Freq.	Max	%
Radio	94	3	38.2	152	4	61.8
Mobile phone	63	2	36.4	110	2	63.6
Bicycle	79	3	45.7	94	4	54.3
Oxen cart	3	5	50.0	3	2	50.0
Watch	29	2	42.0	40	2	58.0
Motorcycle	8	1	50.0	8	1	50.0

Max. Stands for maximum; Data Based on multiple responses

4.1.9 Livestock

Amongst small scale farmers livestock is considered a principal asset and an indicator of wealth (Doocy and Burham, 2006). Table 12 shows simple statistics on livestock ownership, in particular the average and maximum number of livestock kept. There is a difference in the average number of livestock owned by the heads households with access to credit with those that have no access to credit, whereby the average number of livestock owned by households with access to credit is higher than the average number owned by households with no access to credit. Depending on how livestock are valued in the community, a higher average number of livestock implies more wealth, which may imply a higher opportunity to access credit.

In particular, because livestock keeping comes with cost in terms of meeting expenditures on required inputs, farmers with more livestock are more likely to seek for credit than farmers with less. In addition, livestock may be used as collateral.

Table 12: Number of livestock owned

	Access (n = 171)			No access (n = 133)		
	Maximum	Mean	Std. dev	Maximum	Mean	Std. dev
Traditional goats	40	2.1	3.957	27	2.0	3.804
Diary goats	8	0.3	1.043	2	0.0	0.193
Traditional cows	8	0.4	1.025	30	0.9	3.441
Diary cows	4	0.7	0.916	4	0.1	0.520
Pigs	22	1.5	3.224	30	1.2	3.110
Chickens	110	11.4	15.527	100	7.9	13.008
Sheep	13	0.6	1.653	13	0.5	1.433
Donkeys	4	0.1	0.381	0	0.00	0.000

NB: Data Based on Multiple responses

4.1.10 Land use

Land is the primary asset for small scale farmers, who allocate it to various uses. In the area under the survey, it was found that the land owned by heads of household who are

small scale farmers is used for farming and livestock keeping; and the land that is left uncultivated is rented out, as is shown in Table 13. The table shows that there is a difference between average sizes of land used for cultivation in relation to access to credit. The average size of land used for cultivation by heads of household with access to credit is higher than the average size of land owned by heads of household with no access to credit.

Assuming that yield from the two categories of farms is not different, then the bigger the size of the cultivated land, the higher the output; hence, the higher the income from cultivation. Thus, land utilization is likely to influence access to credit in terms of creating different needs of land use and generating income that may facilitate access to credit.

Table 13: Statistics on size of land owned by households (acres)

	Access (n = 171)			No access (n = 133)		
	Size of land cultivated	Size of land not cultivated	Size of land for livestock	Size of land cultivated	Size of land not cultivated	Size of land for livestock
Mean	3.6	0.1	0.1	3.0	0.02	0.4
Std. dev.	3.1	0.1	0.5	2.2	0.3	1.8
Maximum	24.0	1.5	3.0	10.0	2.0	7.0

4.1.11 Wealth

The Principal Component Analysis (PCA) was used to develop the wealth index is shown on Table 14. The results show that variables related to small scale farmers' dwellings such as cemented floor, brick walls and electricity had high scores. There is a possibility that small scale farmers with such dwellings are wealthier and may easily access resources.

Table 14: Component matrix for wealth index

Asset	Component score	Mean	Std. dev.
Electricity	0.680	0.11	0.312
Floor cement	0.809	0.34	0.474
Wall brick	0.651	0.39	0.488
Television	0.649	0.11	0.307
Diary cows	0.585	0.16	0.368
Mobile phone	0.579	0.57	0.496
Chicken	0.488	0.73	0.443
Roof Aluminium	0.480	0.85	0.359
Refrigerator	0.462	0.03	0.170
Tap water	0.418	0.20	0.404
Radio	0.390	0.81	0.391
Vehicles	0.346	0.02	0.150
Milling machine	0.323	0.01	0.114
Roof- grass	-0.484	0.15	0.356
Wall –mud	-0.618	0.34	0.475
Floor-mud	-0.814	0.66	0.475
Motorcycle	0.291	0.05	0.224
Watch	0.240	0.23	0.420
Tractor	0.165	0.01	0.081
Well	0.149	0.07	0.248
Solar	0.147	0.02	0.150
Sewing machine	0.127	0.01	0.099
Electric cooker	0.124	0.01	0.081
Sawmill	0.124	0.01	0.081
Camera	0.049	0.01	0.081
Traditional cows	0.028	0.21	0.411
Traditional coats	0.016	0.43	0.496
Donkey	0.014	0.01	0.081
Roof tin	-0.002	0.00	0.057
Oxen cart	-0.005	0.02	0.139
Wall wood	-0.073	0.26	0.437
Sheep	-0.089	0.17	0.374

Std.dev. stands for standard deviation

Table 15 shows the housing and wealth indices of the respective households in relation to credit access. The average scores of House Quality Index are higher for the heads of households with access to credit relative to households with no access to credit. The high Housing Quality Index by itself may not increase the opportunity of accessing credit; however, it may imply that households with good quality houses are the ones that have a higher socioeconomic status in the community; hence by association, they are more likely to access credit than households whose housing quality is relatively lower. These findings correspond with the findings with regard to the wealth index, which indicates that heads of household with higher wealth index have a higher probability of accessing credit

compared to heads of household with a lower wealth index. These findings are similar to Duflo *et al.* (2008) that small scale farmers with higher wealth are likely to access credit than those who have lower wealth levels, who are considered as poor in their respective communities. Furthermore, Deaton (1989) noted that the poor have smaller cushions and will more often find themselves with no wealth and no opportunity to access credit.

Table 15: Average scores of house quality and wealth indices

		Housing index	Wealth index
Access (n = 171)	Mean	4.3	9.3
	Standard. deviation	1.1	4.9
	Minimum	2.7	4.8
	Maximum	6.9	41.5
No access (n = 131)	Mean	3.9	7.5
	Standard deviation	.76	2.0
	Minimum	1.0	3.5
	Maximum	5.8	19.1
Total	Mean	4.2	8.5
	Standard deviation	0.9	4.0
	Minimum	1.0	3.5
	Maximum	6.9	41.5

4.1.12 Yield of selected crops

Table 16 shows the yield per acre of major crops. The average yields from farms of heads of household with access to credit for crops such as coffee, maize and beans are higher than for farms of heads of household with no access to credit. The higher yields from farms with heads of household with access to credit may have been contributed by more availability of inputs, which may probably have been facilitated by credit to purchase the inputs.

Table 16: Yield of selected crops in kg /acre

Crop	Access			No access			Estimated yield per acre in kg
	Max	Mean	Std dev	Max	Mean	Std dev	
Maize (n=304)	2 000	280.7	256.8	1 600	271.1	249.7	1300
Coffee (n =104)	300.0	34.6(98)	53.8	400.0	29.6(56)	64.8	275
Beans (n = 304)	400.0	26.7	55.4	500.0	21.1	55.9	300
Potatoes (n =28)	600.0	128.5(17)	153.2	400.0	163.3(11)	145.6	

Numbers in brackets indicate number of households

4.1.13 Food self-sufficiency

Food self sufficiency is proxied by the portions of the crops that are not sold, which is shown in Table 17. The mean crops that are not sold are higher for households with no access to credit than for those with access to credit. For example, maize which is a staple food in most parts where the study was conducted - this portion, was 466.8 kg for the households with access to credit and 571.8 kg. for the households with no access to credit. This may imply that households with access to credit sell more food (given that they were shown to cultivate bigger land) to get money, which they may use to pay the interest and principal on credit that they might have taken to finance the purchase of inputs. Moreover, if they do not achieve food self sufficiency, they may seek credit to finance food consumption since they can access credit.

Table 17: Residual (net) of selected crops after sales in kg

	Access		No access	
	Maximum	Mean	Maximum	Mean
Maize	6000.0	466.8	15000.0	571.8
Banana (n =155)	1680.0	222.8	2450.0	80.4
Beans	700.0	45.8	800.0	41.0
Coffee (n =155)	100.0	2.5	200.0	4.8
Potato	200.0	57.6	100.0	21.8

Numbers in brackets indicate number of households

4.1.14 Gross income from crops

The gross income from crops by heads of household is as presented in Table 18. The gross income earned from crops is mainly transitory income. The average score of gross income from crops such as maize, bananas, coffee and vegetables is higher for heads of household who access credit compared with heads of household with no access to credit. The average score of gross income for crops such as beans, potatoes and sunflower is higher for heads of household who have no access to credit. What we observe here is, crops that require inputs such as fertilizers and pesticides earn more gross income to heads of household who access credit than for crops that do not use such inputs.

Table 18: Gross incomes earned from crops (TSh)

Crop	Access (n = 171)		No access (n = 133)	
	Maximum	Mean	Maximum	Mean
Maize	5 000 000.00	121 298.20	1 400 000.00	74 962.40
Banana	498 000.00	24 923.90	30 000.00	225.50
Beans	375 000.00	3 766.00	375 000.00	5 270.60
Coffee	1 200 000.00	49 664.30	630 000.00	22 458.60
Potato	630 000.00	13 350.80	630 000.00	18 894.70
Sunflower	200 000.00	4 941.50	147 000.00	7 751.80
Tomato	700 000.00	5 514.60	2 600 000.00	32 233.00
Onion	100 000.00	584.790	0	.0
Vegetable	750 000.00	48 508.70	448 000.00	25 293.20
Trees	800 000.00	6 433.50	0	0
Tobacco	2 700 000.00	22 035.00	3 000 000.00	38 496.20
Fruits	100 000.00	1 146.19	0	0
Groundnuts	300 000.00	3 941.52	1 000 000.00	8 759.39
Paddy	0	0	10 500 000.00	78 947.36
Wheat	55 000.00	321.63	390 000.00	2 932.33

Note: The prices of crops are the market prices during the survey period.

Therefore, farmers with higher gross incomes from high input intensive crops such as coffee, maize and vegetables are in a better position to access to credit than farmers who earn higher gross incomes from low input intensive crops, such as potatoes and beans. These findings suggest that heads of household may be in need to access credit so as to procure inputs for production of crops.

4.1.15 Gross income from livestock

The gross income earned from livestock by heads of households with access and no access to credit is shown in Table 19. It was found that heads of households with access to credit earned higher gross income from livestock than heads of households with no access to credit. The higher income they earned from livestock may be saved and used as collateral when they need to access credit. Hence, heads of households earning higher incomes from livestock are more likely to use incomes from livestock to access credit than those with no access to credit.

Table 19: Gross income from livestock in TSh

	Access		No access	
Type of Livestock	Mean	Maximum	Mean	Maximum
Traditional goats	1 023.30	360 000.00	4 676.70	160 000.00
Diary goats	6 432.70	450 000.00	375.90	50 000.00
Traditional Cows	8 070.10	550 000.00	38 872.20	2 000 000.00
Diary cows	12 865.50	500 000.00	.00	00
Pigs	59 239.70	1,080 000.00	38 609.00	1 200 000.00
Chicken	8 286.50	280 000.00	5 563.90	140 000.00
Sheep	2 748.50	180 000.00	.00	.00

4.1.16 Net income

Table 20 shows the average score for net income from livestock and crops. The average net income is higher for the heads of households who do not access credit compared to those who access credit. The average net income for livestock for respondents who access credit is negative meaning that they are operating the activity at a loss.

Table 20: Net income from livestock and crops (TSh)

		Net income from crops	Net income from livestock
No access (n = 133)	Mean	216 312.40	52 603.75
	Std. Deviation	980 718.70	249 128.40
	Minimum	(505 000.00)	(280,000.00)
	Maximum	10 037 500	1 952 000.00
Access (n = 171)	Mean	164 952.54	(134 140.73)
	Std. Deviation	566 701.56	250 945.81
	Minimum	(516 000.00)	(1 537 500.0)
	Maximum	6 177 500.00	899 000.00

NB: ( ) imply loss

These results suggest that heads of households who access credit may be incurring more expenses in agricultural activities as shown on Table 21. Probably small scale farmers are devoting all their efforts to increase productivity of crops and livestock, though they are faced with constraints such as adverse weather conditions, unfavorable prices of inputs and outputs and lack of appropriate markets. As a result the small scale farmers are conducting the activities at a loss. Such adverse conditions may force the small scale farmers with access to credit to be liquidity constrained and consequently be unable to repay the credit obtained. However, it may be surmised that the efforts done by the

Government to provide subsidized agricultural inputs have not yet assisted the rural small scale farmer.

Table 21: Average expenses on crops and livestock in TSh

	Access (n = 171)		No access (n = 133)	
	Max	Mean	Max	Mean
Expenses on crops	4 740 000.00	147 560.52	1 460 000.00	117 206.39
Expenses on livestock	1 620 000.00	128 729.35	350 000.00	37 413.63

4.1.17 Remittances and access to credit

Remittances are regarded as a transitory income and therefore supplement household earnings. Table 22 provides information of the various sources of remittances that the heads of household received from sons and/or daughters, relatives and friends. The leading source of remittances is sons and/or daughters is 70% for heads of household with access to credit relative to 29.8% for heads of household with no access to credit. The average amount of remittances received for heads of households with access to credit is also higher compared that of heads of household without access to credit.

The differences may be linked to the previous finding that sons and/or daughters of children whose households have access to credit tend to reside elsewhere, which is an indication that these families are more progressive; hence they are likely to be earning more. Thus, they feel obliged to repay their parents in kind. In addition, heads of household who access credit have a relatively higher expenditure compared to heads of household who do not have access; for example, it was found that they use more inputs in the production of crops; hence they may be requiring remittances in order to repay credit.

Table 22: Sources of remittances and amount received in TSh

Source of Remittance	No access				Access			
	F	%	Max. amount	Mean amount	F	%	Max. amount	Mean amount
Children	17	29.8	350 000.00	23 082.70	40	70.2	1 200 000.00	88 654.90
Relatives	7	50.0	100 000.00	2 789.47	7	50.0	300 000.00	6 736.80
Friends	2	40.0	700 000.00	5 488.72	3	60.00	50 000.00	643.20

F: stands for frequency

Relating age with remittances, most of the heads of household who get remittances are over 50 years old, and most of the remittances come from their children, as presented in Table 23. The table shows that for those with access to credit, 72% of the heads of households of this age group get remittances from children. This finding indicates that heads of household who are 50 years old and above are more likely to have children who are involved in productive activities and can remit money to their parents. Thus, probably elderly heads of household get remittances, part of which can be used to repay any credit they might have taken and also to keep deposits in the rural financial markets that could be used as collateral.

Table 23: Proportion of households' sources of remittances in relation to age group

		No access		Access	
Source of Remittance	Age	F	%	F	%
Children	21-30	0	0.0	0	0
	31-40	1	3.8	1	2
	41 -50	3	11.6	3	6
	51-60	4	15.4	15	30
	61 >	9	34.7	21	42
Relatives	21-30	0	0.0	1	2
	31-40	1	3.9	2	4
	41 -50	1	3.9	3	6
	51-60	3	11.5	1	2
	61 >	2	7.6	0	0
Friends	21-30	0	0.0	0	0
	31-40	0	0.0	0	0
	41 -50	0	0.0	0	0
	51-60	2	7.6	2	4
	61 >	0	0.0	1	2
Total		26	100	50	100

4.1.18 Household disposable income

Referring to Table 24 there is a slight difference between the average disposable incomes per year for the households that have access to credit compared to those that have no access to credit; this implies that disposable income is likely to have no influence on access to credit. Probably the reason may be that the disposable income is not large enough to meet households' current consumption. As Gibson and Scobie (2001) posit that most of the small scale farmers in developing countries have negative savings.

Table 24: Mean disposable income per year in TSh

		Disposable household income
No access (n = 133)	Mean	898 408.60
	Std. dev	2 359 171.10
	Minimum	(280000.00)
	Maximum	23 187500.00
Access (n = 171)	Mean	881 885.50
	Std. dev	1 015473.80
	Minimum	(744 000.00)
	Maximum	6 358 250.00

4.2 Credit Sources

4.2.1 Forms of credit sources

4.2.1.1 Informal sources of credit

The informal credit sources by the heads of households in the survey areas are as indicated in Table 25. The uses of the sources vary from one district to another. The use of friends residing within the village as a source of credit was dominant in Iringa (66.7 %). Moshi Rural District use Village Community Banks (VICOBA); whereas 40.5 % of the heads of household in Rombo District use *Kiarano* (traditional self-help group*s*) as a source of credit. Thus, friends within the village were found to be mostly used as a source of credit in Iringa Region, whereas the *kiarano* and VICOBA, which are member based groups, are mostly used as a source of credit in the wards located in Kilimanjaro Region.

These differences are probably due to cultural differences or trust. That is, probably small scale farmers rely on sources of credit that they trust the most; these are embedded within their culture. It is eminent that there are significant cultural differences between people of Kilimanjaro Region and those of Iringa Region.

Table 25: Proportion of informal credit sources used in Iringa and Kilimanjaro Regions

Credit Source	Iringa		Kilimanjaro	
	Iringa (n = 36) %	Mufindi (n = 11) %	Moshi Rural (n = 38) %	Rombo (n = 84) %
Money Lender	2.8	9.2	0.0	
Friends Within Village	66.7	54.6	14.3	23.8
Neighbor	19.4	9.2	4.1	3.6
Clan	0.0	0.0	0.0	8.3
Kiarano	2.8	0.0	0.0	40.5
Women Group	0.0	9.1	0.0	7.1
Religious *Jumuiya*	0.0	0.0	4.1	10.7
Shop	0.0	0.0	0.0	4.8
ROSCA	8.3	0.0	0.0	1.2
VICOBA	0.0	0.0	77.6	0.0
Total	100	100	100	100

4.2.1.2 Semi-formal sources of credit

Table 26 presents findings on the semi–formal sources used by the heads of household in the respective districts. The use of Savings and Credit Cooperative Societies (SACCOS) as a source of credit was dominant in Mufindi District (82.8%) in Iringa Region, whereas for Iringa Rural District, it was 40.6% whereby FINCA was the dominant source of credit. In Kilimanjaro Region, most of the heads of households were found to be using SACCOS as a source of credit. According to key informants, the use of semi-formal sources depended on the availability of the service and the extent to which the mobilization process by the respective financial markets was conducted. In addition, the heads of households noted that the leadership approaches and bureaucracy in SACCOS discourage participation. This may be the reason why there is a variation in the use of semi-formal

sources by the heads of household in the respective wards. However, the key informants explained that members of informal member based groups such as VICOBA and *Kiarano* deposit their collections in SACCOS. This is because SACCOS are perceived to be safe to keep members deposits in the rural areas.

Table 26: Proportion of semi-formal credit sources used in Iringa and Kilimanjaro Regions

Credit Source	Iringa region		Kilimanjaro region	
	Iringa rural district (n = 43) (%)	Mufndi district (n = 29) (%)	Moshi rural district (n = 23) (%)	Rombo district (n = 18) (%)
SACCOS	23.5	82.8	100	100
SACA	9.4	0	0	0
FINCA	46.6	7.1	0	0
PRIDE	20.5	0	0	0
Total	100	100	100	100

4.2.1.3 Formal sources of credit

The formal sources indicated in Table 27 are located at the district headquarters. As shown in the table, relatively few heads of household use formal sources of credit. The only source that is mostly used is Mufindi Community Bank (MUCOBA). The reason is that MUCOBA has put particular efforts for expanding outreach by providing credit through groups that are formed in the rural areas, thus reaching small scale farmers through group lending. The formal financial markets, like the commercial banks are yet to penetrate the rural areas.

Table 27: Proportion of formal credit sources used in Iringa and Kilimanjaro Regions

Credit Source	Iringa region				Kilimanjaro region			
	Iringa Rural		Mufindi		Moshi Rural		Rombo	
	Freq.	%	Freq	%	Freq	%	Freq	%
NMB	1	100	2	25	0	0	1	100
MUCOBA	0	0	6	75	0	0	0	0
CRDB Plc	0	0	0	0	1	100	0	0
Total	1	100	8	75	1	100	1	100

4.2.2 Comparative analysis of credit sources used

The credit sources used by the heads of household are summarized in Fig. 4. The results show that in the survey areas 59 % of the heads of households are using informal sources. Moreover, the informal rural financial markets dominate the semi formal and informal financial sources. One of the possible reasons for this is that informal sources enjoy location advantages; whereby they provide services that are tailored to the needs of the small scale farmers. The informal markets are usually closer to the people and as such the clients are well informed of their operations and the operators of the informal markets are well informed of their clients. In addition, probably the services that are offered by the informal rural markets are suitable for the rural poor small scale farmers. The results of this study are in consonance with other that also found informal rural financial markets as the mostly used form by the rural poor small scale farmers, which include, among others, Aryeetey, (2008), Ndanshau, (1996), and Kashuliza (1994).

Furthermore, the results show that only 4% of the heads of household use the formal sources. This percentage is probably composed of heads of households from the upper income category in the rural areas. The formal sources usually have good systems and infrastructure. They also provide an opportunity for diversifying the credit portfolio and benefit from a wide range of services, compared to the informal rural financial markets. Despite these advantages, this study found that they are not used by the majority of the rural small scale farmers, probably because the infrastructure for providing those services is not yet in place in the rural areas.

The semi-formal sources are used by 37% of the heads of household. The possible reason for using of these sources by the small scale farmers is that one of their objectives is to provide micro-credit to the poor. In addition, they are either located closer to the people

or services they provide are closer to the people. Moreover, the study found from key informants that the credit portfolio of semi-formal rural financial markets is not as diversified as the formal financial markets and not as concentrated as the informal ones.

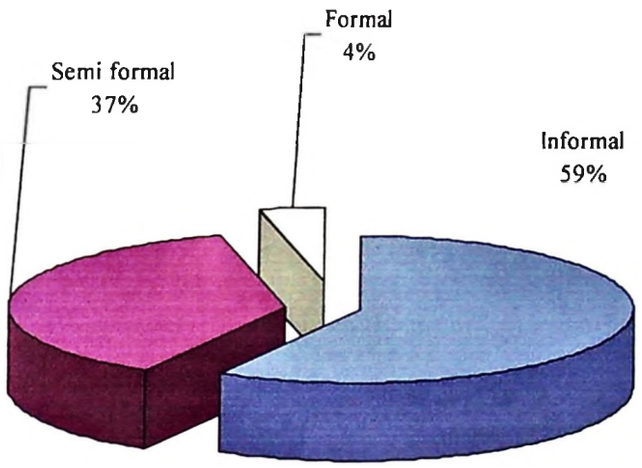

Figure 4: Percentage of credit sources used by type of financial market

4.2.3 Use of credit sources by sex

4.2.3.1 Informal sources of credit

The results on the use of informal credit sources by sex are summarized in Table 28. As shown in the table, both female and male heads of households use friends within the village as their sources of credit (32.1% and 29.6% for female and male, respectively) and VICOBA (22.6% and 20.8%, for female and male, respectively).

Other significant sources are neighbours and women groups for female heads of households (13.2 % for each) and *Kiarano* for male heads of households (24.8 %). The study found that the sources for women are based on trust and they comprise fellow women; hence there is a spirit of helping one another.

In addition, these sources do not require physical collateral; as well, the amount of credit involved is small. The study found from informants that women adhere and respond positively to social sanctions imposed by the informal rural financial markets. This finding is shared by Johnson (2004) who posited that the greater use of women in ROSCAS arises from the effectiveness of the social sanctions of shame on women compared to men. Finally, females would prefer to use such sources that are closer to their homesteads due to household responsibilities, which constrain them from being far from home. This finding is in support of the theory of human capital, which posits that women are more inclined than men to invest most of their time in managing family business and relationships (Jacobsen, 1998).

Next to friends, most of the male heads of households prefer the *Kiarano* possibly because the amount of credit they can get is relatively high compared to other sources. In addition, *Kiarano* is a traditional self help group based on cultural networks whereby membership is for both husband and wife. Hence, the head of the household, who is the male, is responsible for the credit.

Table 28: Proportion of informal sources of credit used by sex

	Female (n = 53) (%)	Male (n= 125) (%)
Money Lender	1.9	0.8
Friends	32.1	29.6
Neighbour	13.2	4.8
Clan	1.9	4.8
Kiarano	5.7	24.8
Relative	1.9	0.8
Women Group	13.2	0.0
Religious *Jumuiya*	3.8	7.2
Shop	0.0	3.2
ROSCA	3.8	3.2
VICOBA	22.6	20.8
Total	**100**	**100**

4.2.3.2 Semi-formal sources of credit

The use of semi-formal sources is as shown in Table 29. Most of the female heads of households use SACCOS (60%) as contrasted to male heads of households, who mostly use financial non governmental organizations (45.8%). Most of female heads of household are using SACCOS because of the type of collateral, which is mostly savings, and use of guarantors. On the other hand, most of the male heads of household use NGOs than female heads of household. This may be due to the type of collateral required, which is physical assets like land, livestock, radios and household furniture Culturally, in most of the rural African societies physical property is owned by males. Thus, males become better placed to pledge their physical property, such as land, as collateral. Unlike men, women are, generally, not allowed to claim ownership of such physical property in the household. Despite the cultural constraints, government interventions on credit programs are encouraging the participation of women in credit access, particularly in SACCOS.

Table 29: Proportion of semi-formal sources of credit used by sex

	Female (n = 35) (%)	Male (n =48) (%)
SACCOS	60.0	50.0
SACA	5.7	4.2
Financial NGO	34.3	45.8
Total	100	100

4.2.3.3 Formal sources of credit

The use of formal sources by sex is as shown in Table 30. From the table it is observed that most of the male heads of households use formal sources of credit compared to female heads. One of the reasons for this is that formal sources require collateral, which is usually physical collateral. Secondly, it may be due to the size of credit, which is usually relatively larger; and thirdly, it may be due to the distance to and from the financial market, whereby

they are located in urban centers; hence it is expensive in terms of time taken, transport cost and other expenses incurred.

Table 30: Proportion of formal sources of credit used by sex

	Female (n =1) (%)	Male (n =10) (%)
NMB	0	40
CRDB Bank Plc	0	10
MCB	100	50
Total	100	100

4.3 Credit Delivery Methods

Lending to individuals is the most dominant method by which the heads of households in all the districts covered were using to access credit, as shown in Table 31. This service is offered by, friends within the village, neighbours, *Kiarano*, shops, moneylenders and religious *jumuiya,* VICOBA, SACCOS and SACAS. It was found that the dominant source of credit is the informal financial market. The heads of household noted that there were no conditions that were tied with the credit, such as collateral and guarantor; in addition, the credit was offered with no interest payment. The repayment period was also negotiable, with extensions when an individual was not able to repay. On this account, Turvey *et al.* (2009) note that it is trust play a major role in issuing and accessing the credit.

Group lending was found to be the most unpopular method (Table 31). This method is used by FINCA, PRIDE and Mufindi community Bank. The study found from key informant that the group that has functions of allocating credit, evaluating collateral and monitoring member's performance. Probably these functions are becoming unfavorable to group members. The reason may be that the major problem of group lending is the

covariate shocks that occur when a member of the group fails to pay, such shocks discourage group lending.

Table 31: Distribution of credit delivery methods

	Iringa region				Kilimanjaro region			
	Iringa Rural		Mufindi		Moshi Rural		Rombo	
Credit delivery method	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Individual	45	59.3	33	70.2	50	67.5	96	67.5
Group	31	40.7	14	29.8	24	32.5	7	32.5
Total	76	100	47	100	74	100	103	100

Frequencies are multiple responses

4.4 Factors Influencing Access to Credit

4.4.1 Need for credit

Need for credit refers to whether the heads of household require credit or not. Table 32 draws a comparison of need for credit by heads of households between those who have access to credit and those that do not have access. The table shows that most of the heads of households need credit, regardless of whether they have access of not. These results confirm that most of the small scale farmers need credit, despite of the constraints they face at household level. However it is revealed that very few small scale farmers do not need credit, which may be due to various reasons such as old age, trust and attitude towards credit.

Table 32: Distribution on need for credit by households

		No access (n = 133)		Access (n = 171)	
		Freq	%	Freq	%
Do you need credit	Yes	121	91	162	95
	No	12	9	9	5
Total		133	100	171	100

The need for credit is assumed to have a relationship with the amount of income available. In Table 33 the study shows that heads of households who would need credit if they earn negative disposable incomes; all respondents who do not have access to credit (100 %) indicated that they would need credit compared 93.8% of those who have access to credit. Even if they were to earn positive disposable income, both groups still indicated a need for credit (90.6% of those with no access, compared to 94.3% for those with access). Given that that the sample constituted more of those with access to credit, a higher percentage indicates that having disposable income does not prevent one from the need, particularly when they have access to credit. These findings imply that most of the heads of household with access or without access to credit still need credit to supplement income earned irrespective of the amount of disposable income. It may be deduced that credit is needed by small scale farmers' in order to cater for their consumption and investment decisions, since their income is limited and choices are numerous. Furthermore it may be surmised that the heads of household view credit as a means of improving livelihood at household level.

Table 33: Need for credit in relation to household disposable income

	No Access (n = 133)				Access (n = 171)			
	Yes		No		Yes		No	
	Freq.	%	Freq	%	Freq	%	Freq	%
Do you need credit if income > 0	106	90.6	11	9.4	149	94.3	9	5.7
Do you need credit if income <= 0	15	93.8	2	6.2	13	100	0	0.0

4.4.2 Purpose for need of credit

The purpose of heads of household need for credit is divided into consumption, off farm activities and on farm activities, as shown in Table 34. Most of the heads of households with access to credit and those with no access to credit indicated that they needed credit to pay school fees. This suggests that the heads of households put value to education of their

children, such that they are ready to go into debts to ensure that they pay school fees. Since they are paying the school fees now, this is an indication that they are constrained by the resources, and access to credit is one of the ways to expand the resource envelope. Probably the financial markets may look upon this as an area of intervention and ease the constraint that the small farmers are facing, since educating their children is one way that could reduce intergenerational poverty.

Based on on-farm activities purchasing of farm inputs is the dominant activity for households that have access to credit. While, for the heads of household that have no access to credit, they showed that they need credit to purchase livestock. The results indicate that heads of households with access to credit probably consider farming as an important activity for earning income.

Table 34: Percentage share on need for credit by household heads

Reason	Access (n = 171)		No access (n = 133)	
	Freq	%	Freq	%
Household goods and services				
Purchasing items i.e utensils, cooking stoves	2	7.4	1	8.3
Paying school fees	21	77.8	10	83.3
Purchasing food i.e maize	3	11.1	0	0.0
Medical	1	3.7	1	8.3
On-farm				
Purchasing farm inputs	76	37.8	65	37.3
Purchasing livestock inputs	40	19.9	32	18.4
Purchasing livestock	77	38.3	67	38.5
Purchasing farm land	5	2.5	4	2.3
Horticulture	2	1	2	1.2
Purchasing tree seed	1	0.5	4	2.3
Off farm				
Rehabilitating house	0	.0	1	1.5
Building house	6	6.5	7	10.3
Building a livestock	1	1.1	0	0.0
Installing electricity	1	1.1	1	1.5
Installing solar energy	1	1.1	1	1.5
Operating a small business	82	89.1	5.6	82.4
Installing tap water	0	0	2	2.9
Timber business	1	1.1	0	.0

Frequencies are multiple responses

In addition, they may have adequate land for farming; whereas heads of households that do not have access to credit are either land constrained or consider farming as being not very productive. It is also likely that they need to purchase livestock to complement their farming activities. Either way, credit is needed for alternative income generating activities. However, for off farm activities, greater percentage of the heads of households needs credit for operating small-businesses, as shown in the table. This reflects that the head of household needs credit to operate small business so as to supplement the declining incomes from on-farm activities.

4.4.3 Credit history of small scale farmers

The number of times the household heads have applied and received credit from a particular source was taken as a proxy for the heads of household credit history. Table 35 shows the number of times heads of households applied for credit from formal, semi-formal and informal sources. From the table it is evidenced that heads of household with access to credit applied for credit more times from all the credit sources available than those who do not have access. These findings suggest that heads of households with no access are faced with constraints that either deny them opportunities to repeat borrowing or not to borrow at all from the financial markets relative to heads of households with access to credit.

Table 35: Percentage on credit application by the head of household

Times applied for credit	No access (n = 133)						Access (n = 171)					
	Formal		Semiformal		Informal		Formal		Semiformal		Informal	
	F	%	F	%	F	%	F	%	F	%	F	%
Once	2	66.7	17	30.4	14	30.4	2	33.3	39	69.6	32	69.6
Twice	0	0	11	23.9	6	20.0	4	100	35	76.1	29	80.0
Thrice	0	0	7	36.8	5	35.7	1	100	12	63.2	9	64.3
More than four tomes	0	0	5	25.0	3	37.5	1	100	15	75.0	5	62.5

Frequencies are multiple responses; F stands for frequency

The same is true with those who received credit, as shown in Table 36. That is, more heads of households with access to credit were able to get credit compared to those who have no access (Refer to the definition of access to credit in chapter two) These results are as expected, since heads of households with access to credit have higher chances of receiving credit than who have no access.

Table 36: Percentage of credit received by the head of household

Frequency a head of household has received credit	No access						Access					
	formal		Semiformal		informal		formal		semiformal		informal	
	F	%	F	%	F	%	F	%	F	%	F	%
Once	2	50.0	17	35.4	13	31.7	2	50.0	31	64.6	28	68.3
Twice	0	0.0	10	22.2	6	25.0	4	100	35	77.8	18	75.0
Thrice	0	0.0	7	36.8	5	35.7	3	100	12	63.2	9	64.3
More than four tomes	0	0.0	4	21.1	3	37.5	1	100	15	78.9	5	62.5

F stands for frequency

4.4.4 Credit sources and access to credit

From the Table 37, it is further indicated that most of the household heads who have had access to credit and those who have not had access to credit, up to the time of the survey, sought credit from friends within the village to seek for credit. The dominance of using friends within the village is probably related to proximity, flexibility of conditions, zero interest rate and trust.

Table 37: Proportion of informal sources of credit and access to credit

Type of Source	Access		No access	
	Freq	%	Freq	%
Friends within the village	34	27.4	20	37.0
Neighbour	6	4.8	7	13.0
Clan	4	3.3	3	5.6
Kiarano	24	19.4	10	18.6
Father	1	0.9	1	1.8
Women group	6	4.8	1	1.8
Religious *jumuiya*	6	4.8	5	9.3
ROSCA	3	2.4	3	5.7
VICOBA	37	29.8	1	1.8
SHOP	3	2.4	1	1.8
Spouse	0	.0	2	3.6
Total	124	100	54	100

Frequencies are multiple responses

In Table 38 it is shown that SACCOS was found to be the primary source of soliciting for credit by both heads of households who have access to credit and those without access to credit. The use of SACCOS as a source of credit has been promoted by the Government of Tanzania throughout the country. SACCOS are taken to be as the most reliable rural financial markets that can serve the rural poor. Given these results and the implied conjecture, it may be surmised that appropriate interventions could contribute to the semi-formal financial markets efforts at improving access.

Table 38: Distribution of semiformal sources of credit and access to credit

	Access		No access	
	Freq	%	Freq	%
SACCOS	60	69.7	15	55.6
SACA	3	3.6	1	3.7
NGO	23	26.7	11	40.7
Total	86	100	27	100

Frequencies are multiple responses

Formal sources of credit in which small scale farmers participate are commercial banks that are located at the District headquarters, which include, the National Microfinance Bank (NMB), CRDB Plc and Mufindi Community Bank (MUCOBA). As shown in Table 39, very few heads of households with access to credit (6 out of 304) had solicited for credit from formal markets. The possible reasons may include location, high collateral and high transaction costs required by these financial markets. Thus it may be possible that the formal financial market services are biased in favor of urban residents and in disfavor of the rural small scale farmer.

Table 39: Distribution of formal sources of credit and access to credit

	Access		No access	
	Freq	%	Freq	%
NMB	3	75	1	50
CRDB Bank Plc	1	25	0	.0
MUCOBA	1	25	1	50
Total	4	100	2	100

Frequencies are multiple responses

who have access to credit prefer to use the Financial NGOs, probably due to the use of group lending approach, whereby social capital is required as a collateral.

Table 41: Percentage of semi-formal credit sources by sex

Type of Source	Access				No access			
	Male		Female		Male		Female	
	Freq	%	Freq	%	Freq	%	Freq	%
SACCOS	42	76.4	18	58.1	12	52.2	3	75.0
SACA	1	1.8	2	6.4	1	4.3	0	0.0
Financial NGO	12	21.8	11	35.5	10	43.5	1	25.0
Total	55	100	31	100	23	100	4	100

Frequencies are multiple responses

Table 42 shows that female heads of households who have access to credit are not using any formal source of credit compared to male heads of household. These results tend to support the arguments that female heads of household (female small scale farmers) do not use formal sources of credit, because they lack physical capital as collateral.

Table 42: Percentage of formal credit sources by sex

	Access				No access			
	Male		Female		Male		Female	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
NMB	3	33.3	0	0.0	1	100	1	100
CRDB Bank Plc	1	11.1	0	0.0	0	0.0	0	0.0
MUCOBA	5	55.6	0	0.0	0	0.0	0	0.0

Frequencies are multiple responses

4.4.6 Amount of credit received

Table 43 shows the average amount borrowed from the informal financial markets that are in the survey area. A comparison between the heads of households that had access and those who had no access to credit shows that there is a significant difference in the amounts that the heads of households received. From all the sources, the heads of households with access received smaller amounts compared to the heads of household with no access.

However, the exception was the *Kiarano* whereby heads of households with access received a higher amount than the heads of household with no access. It seems that heads of households who have no access to credit take relatively higher amounts of credit from the informal sources than those who have access to credit. Thus, these results suggest informal sources of credit provide small amounts of credit to the heads of households. Such amounts are suitable for small scale activities and financing emergencies at household level. Probably, informal financial markets may still have an important role in the rural areas.

Table 43: Amount of credit received from informal sources in TSh

Type of source	Access			No access		
	Max.	Mean	Std. dev	Max.	Mean	Std. deviation
Moneylender (n=2)	0	0	1	160 000.00	130 000	42 426.40
Friends in village (n= 51)	320 000.00	72 433.30 (30)	70 909.60	1 000 000.00 (21)	112 761.90	217 421.60
Neighbour (n= 12)	50 000.00	27 500.00 (6)	73 047.90	200 000.00	76 000.00 (6)	12 549.90
Clan (n= 5)	35 000.00	27 500.00 (3)	10 606.60	400 000.00	156 666.60 (2)	211 266.00
Friends out village (n= 3)	200 000.00	133 333.30	57 735.00	0	0	1
Shop (n= 1)	40 000.00	40 000.00		0	0	1
Kiarano (n = 32)	1 000 000.00	128 478.2 0(23)	227 673.18	250 000.00	71 222.22 (9)	72 549.59
Women Group (n = 3)	100 000.00	49 166.66	28 357.83	0	0	1
Religious *jumuiya* (n = 9)	40 000.00	25 000.00 (4)	10 000.00	200 000.00	47 000.00 (5)	85 556.99
Rosca (n = 6)	60 000.00	373 333.30 (3)	241 108.50	50 000.00	28 000.00 (3)	19 287.30
Vicoba (n= 38)	40 000.00	60 000.00 (37)	80 507.89	60 000.00	60 000 .00(1)	0

Numbers in brackets indicate the number of heads of households in that category.

From Table 44 the average amount of credit received by heads of household with access to credit is higher than the amount received by the heads of household with no access to credit. The study suggest that the reason for this difference is that the heads of households with access to credit request for higher amounts of credit from semi-formal rural financial markets to finance productive activities, which require higher amounts of credit. In addition, heads of households with access to credit may be wealthier and are likely to borrow higher amounts of credit. Wealth possessed can also be used as collateral and it builds confidence to the various sources that they borrow from because they can manage to repay.

Table 44: Amount of credit received from semi-formal sources in TSh

Type of Source	Access Max.	Access Mean	Access Standard deviation	No access Max.	No access Mean	No access Standard deviation
SACCOS n= 72	2 000 000.00	538 666.66 (57)	770 462.44	2 700 000.00	372 894.73 (15)	391 980.94
SACA n= 4	300 000.00	150 000.00 (3)	132 287.56	40 000.00	40000. 00 (1)	
PRIDE n = 10	500 000.00	264 285.71 (7)	140 577.04	500 000.00	266 666.66 (3)	208 166.59
FINCA n =21	500 000.00	194 666.66 15)	141 197.26	400 000.00	178 333.33 (9)	129 607.46

Numbers in brackets indicate the number of heads of households in that category.

The amounts of credit that heads of households borrowed from the formal sources that are located in the urban areas are as shown in Table 45. The average amount borrowed by the heads of household who have access to credit is twice as much higher than for those who do not have access to credit from the sources prescribed. This difference in the amounts between heads of households who have access and those who have no access is attributed to the conditions required by the formal financial markets and the distance to be covered. These findings also suggest that the credit products offered by these markets are not favorable for the rural small-scale farmers.

Table 45: Amount of credit received from formal sources in TSh

	Access			No access		
	Max	Mean	Standard deviation	Max	Mean	Standard deviation
NMB n = 4	1 300 000.00	1 100 000.00 (3)	173 205.08	400 000.00	300 000.00 (1)	42 426.40
MUCOBA n = 6	900 000.00	600 000.00 (5)	294 392.02	150 000.00	150 000.00 (1)	217 421.68
CRDB Plc n= 1	2 000 000.00	2 000000.00		0	0	1

Numbers in brackets indicate the number of heads of households in that category.

4.4.6.1 Credit amount borrowed by heads of household by age

The amount borrowed from informal and semiformal sources differ with age, as shown in Fig. 5: and Fig. 6. In Fig. 5, it is shown that for the heads of households that borrowed from semi-formal financial markets, the amount borrowed changed with age; thus, the curve has a hump shape that reveals that at a lower age, i.e., between 21- 30 years, the amount borrowed is lower than that for heads of households aged between 31 and 50 years.

On the other end, heads of households aged above 50 years borrowed smaller amounts compared to those in other categories. These changes in amounts borrowed by age conform to the Life Cycle Hypothesis by Modigliani and Miller (1957) that the amounts borrowed over the lifetime change so as to smoothen the consumption and investment patterns. Young heads of households borrow smaller amounts probably because of lower consumption levels, whereas heads of households in the middle ages of 31 to 50 years borrow higher amounts due to higher consumption and investment activities that require more financing. However, at mid-ages, small scale farmers are more productive; thus, they earn higher incomes, which makes it easier for them to access credit from semi-formal sources that require some form of collateral. At older ages, the small scale farmer has lower consumption and investment activities that require external financing; hence, they

borrow less from the semi-formal financial markets. These results suggest that heads of households in their middle ages have better access to credit in the semi-formal financial markets compared to the young and the elderly.

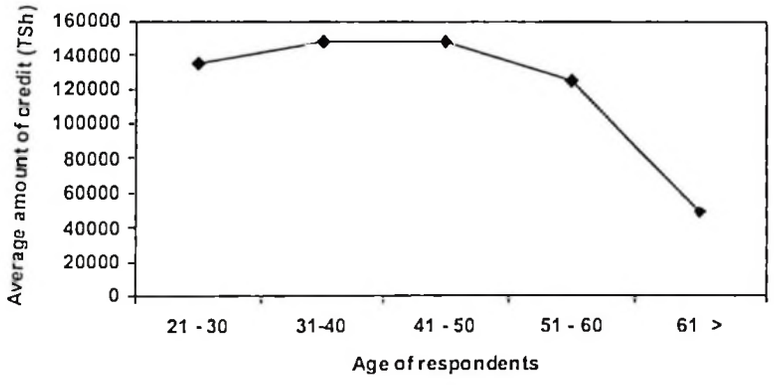

Figure 5: Mean credit amount borrowed by head of household by age in semiformal financial markets

However, the use of informal financial markets is relatively different compared to the semi-formal rural financial markets whereby the higher the age the more the amount borrowed. Fig. 6: depicts upward sloping curve, which indicate that the older the head of household, the more the amount borrowed. The results imply that, in order to smooth consumption at household levels, elderly small scale farmers prefer to borrow higher amounts from the informal rural financial markets, perhaps because they entail location advantages, that is the sources of credit are in close proximity to their homesteads. Secondly, elderly small-scale farmers have stayed in the rural areas for a relatively longer time; hence, they are highly trusted in the community compared to younger small scale farmers. Trust can therefore be treated as collateral. In old age, small scale farmers are not very productive and are less likely to access credit from semi-formal and formal sources. Thus these results suggest that at old age, heads of households find better access to credit in informal sources.

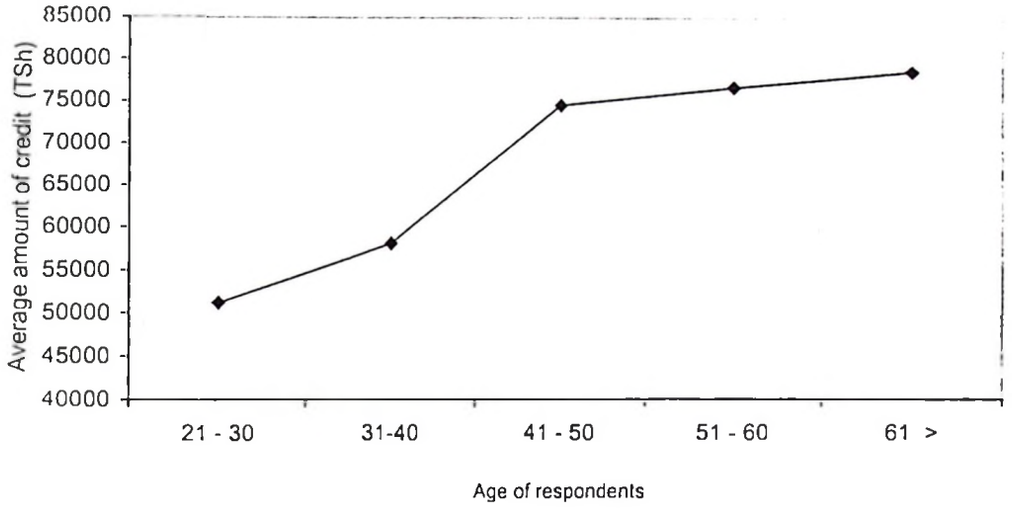

Figure 6: Mean credit amount borrowed by head of household by age in informal financial markets

4.4.7 Use of credit

During the survey, the heads of households with access to credit and those with no access to credit provided information on how they used the credit obtained. However, it is important to note that credit is fungible; that is to say, when an individual takes credit he/she can use it for another purpose that differs from the purpose for which credit was taken. Hence, because it is difficult to observe heads of households' use of credit, it was taken that their responses represent the use to which the taken credit was put to. Table 46 shows the heads of household use of credit for consumption based activities.

The results of the study show a significant difference in the use of credit between the heads of households who have access to credit and those who have no access to credit. From the table, we observe that 42.6 % of the heads of households with no access to credit used credit for paying school fees, compared to 28.9 % of the heads of household with no

access to credit. This implies that more heads of households with access requested for credit for education purposes compared to those with no access to credit.

Table 46: Use of credit on household goods and services

Type of Activity	No access (n =38) (%)	Access (n =54) (%)
Purchasing food	18.4	20.4
School fees	28.9	42.6
Medical purposes	36.8	20.4
Purchase of food crops	10.5	9.3
Social events like weddings	2.7	0
Purchasing of school uniform	2.7	1.8
Purchasing of clothes	0	1.8
Purchase a TV	0	3.7
Total	100	100

However most of the heads of households with no access to credit used credit for medical purposes These results suggest that small scale farmers expenditure in such activities is basic but access to such activities is denied by limited income, thus may be financial markets need to take this on board.. Table 47 shows the heads of household use of credit for off-farm activities. The difference in the use of credit from the heads of household who have to access credit and no access to credit for off-farm activities was shown to be not very significant. About 81% of the heads of households with access to credit used credit for small business compared to 76% of the heads of households with no access to credit. This indicates that, although more heads of households with access to credit requested credit for operating small businesses compared to heads of households with no access, both groups showed inclination of using the credit for business activities. These findings suggest that access to credit would facilitate the undertaking of alternative activities that generate income for all farmers.

Table 47: Use of credit on off-farm activities

Type of Activity	No access (n =24) (%)	Access (n = 73) (%)
Installing electricity	0	3
Installing water	4	3
Building house	8	4
Constructing livestock burn	8	6
Operating a small business	76	81
Purchasing of solar energy	0	1.5
Purchasing milling machine	4	1.5
Total	100	100

Table 48 shows the heads of households' use of credit for on-farm activities. Compared to the other activities, few heads of household use credit for on-farm activities. There is a significant difference in the use of credit from the heads of households with access and no access to credit. The results show that heads of households with access to credit use credit for paying for labour (57.2 %) whereas those with no access to credit do not. The use of credit by heads of households for on farm activities like paying for labour indicates that there are shifts from the traditional way farming by small scale farmers. Reliance on family labour and the traditional rotating labour associations for farming are declining. This decline has led small scale farmers to rely on alternative on-farm activities.

Table 48: Use of credit for household on-farm activities

	Access (n = 36)		No access (n =7)		
Type of Activity	Freq	%	Freq	%	Total
Purchasing livestock	7	19.0	1	14.2	8
Planting	4	10.0	3	42.9	7
Weeding the farm	5	13.8	3	42.9	8
Paying for labour	20	57.2	0	0.0	20
Total	36	100	7	100	43

4.4.8 Knowledge on credit

The knowledge index for heads of household with access and no access to credit was developed using the principal component analysis as shown on Table 49. These

statements satisfy the condition that the correlations in the matrix are greater the 0.30 (Kline 2008). Furthermore the statements with communalities less than 0.50 were removed.

Table 49: Component matrix for knowledge index

Statements	Component 1	2
Meaning of credit	0.78	0.49
The by-laws of rural financial markets/ formal or informal	0.92	0.12
The procedures of getting credit	0.92	0.13
The conditions that are required for you to get credit	0.93	0.12
The criteria of forming a peer group	0.87	0.01
A credit application form	0.93	-0.11
How to fill a credit application form	0.92	-0.13
That there is a credit committee	0.91	-0.17
The functions of a credit committee	0.89	-0.21
Membership of the credit committee	0.91	-0.21
The types of credit offered	0.93	-0.09
The interest rate on credit	0.95	0.02
The maximum amount credit offered	0.94	-0.01
The collateral required	0.94	0.02
The guarantors required	0.94	0.04
How long it takes to get credit	0.95	-0.01
The mode of repayment	0.96	-0.01
The penalties set on failure to repay	0.94	0.02
The repayment period of credit offered	0.95	0.02

From Table 50 we observe that mean scores for heads of household with access to credit are higher than then mean scores for heads of household with no access to credit. This illustrates that heads of household with knowledge on credit have a higher possibility of accessing credit compared to those with no access.

Table 50: Mean scores of knowledge index

Item	Access (n=171)	No access (n =133)
Mean	5.5	3.3
Standard deviation	1.9	1.9
Minimum	1.4	1.4
Maximum	6.8	6.8

Furthermore, Table 51 shows the average scores of the respective statements on knowledge in relation to access. The average scores for heads of household on all statements are higher for the heads of households with access to credit than the average scores of the heads of household with no access. This suggests that knowledge on credit has an influence on access to credit. Hence, heads of households with knowledge on credit are more likely to access credit than heads of households with no access to credit.

Table 51: Average scores of knowledge on credit index and access to credit

	Access (n =171)		No access (n =133)	
	Mean	Std dev.	Mean	Std dev.
Meaning of credit	4.6	0.834	4.26	1.100
The by-laws of rural financial markets/ formal or informal	3.9	1.487	2.67	1.608
The procedures of getting credit	3.9	1.536	2.62	1.645
The conditions that are required for you to get credit	3.89	1.515	2.62	1.627
The criteria of forming a peer group	3.58	1.601	2.45	1.559
A credit application form	3.68	1.683	2.26	1.614
How to fill a credit application form	3.64	1.703	2.15	1.569
That there is a credit committee	3.54	1.667	2.20	1.564
The functions of a credit committee	3.46	1.698	2.14	1.538
Membership of the credit committee	3.49	1.675	2.12	1.533
The types of credit offered	3.68	1.621	2.27	1.587
The interest rate on credit	3.82	1.574	2.41	1.606
The maximum amount credit offered	3.73	1.591	2.38	1.565
The collateral required	3.90	1.555	2.59	1.643
The guarantors required	3.92	1.516	2.59	1.633
How long it takes to get credit	3.73	1.583	2.32	1.545
The mode of repayment	3.78	1.586	2.33	1.575
The penalties set on failure to repay	3.73	1.598	2.42	1.592
The repayment period of credit offered	3.74	1.595	2.44	1.602

4.4.9 Attitude towards credit

The heads of household responded on several statements on their view on attitude towards credit. Principle component analysis was used to develop the attitude index, the results of which are summarized in Table 52. The statements with communalities less then 0.5 were removed as reflected in the first component. The matrix satisfied the condition of having some of the correlations being greater than 0.30.

Table 52: Component matrix for attitude index

Statement	Component	
	1	2
It is impossible to get credit	0.576	0.019
Do not like credit	0.552	0.457
Do not take credit because it will make me poor	0.649	0.483
Do not take credit because the community will judge me as poor	0.707	0.521
There is favouritism in issuing credit	0.681	-0.036
Do not take credit because it will not make any changes in my livelihood	0.691	0.359
Credit is for the rich	0.712	0.030
Credit is risky	0.513	0.129
Religious belief prohibit credit	0.419	0.216
Credit is for men only	0.654	0.109
Staff members are not friendly and encouraging	0.816	-0.469
Staff members and leaders reveal the amount of credit that an individual has been availed	0.797	-0.438
Leaders/board members are not friendly and encouraging	0.820	-0.467
Do not take credit because of the poor performance of the rural financial market in the past	0.775	-0.391

From Table 53 a comparison was made between the heads of households with access to credit and those with no access to credit. The mean scores for the heads of household with access were found to be slightly higher than the mean scores for the heads of households with no access to credit. These results indicate that heads of households attitude towards credit has an influence on access. The implication is that heads of households with positive attitude towards credit have a higher probability of accessing credit than those who are indifferent of have a negative attitude.

Table 53: Mean attitude index and access to credit

Item	Access (n =171)	No access (n =133)
Mean	4.2	3.0
Standard deviation	0.605	0.736
Minimum	2.14	1.00
Maximum	5.00	5.00

The detail with regard to a summary that is presented in Table 51 are contained in Table 54, which shows that the average scores on attitude statements for the heads of household with access were higher than for those who had no access to credit. The

positive attitude towards access to credit for heads of households with access to credit indicates that attitude towards credit has an influence on access to credit.

Table 54: Mean scores on attitude towards credit and access to credit

	Access (n =171)		No access (n=133)	
Statements	Mean	Std dev.	Mean	Std dev.
It is impossible to get credit	4.05	1.271	2.93	1.606
Do not like credit	4.50	0.714	4.09	1.190
Do not take credit because it will make me poor	4.39	0.713	3.83	1.262
Do not take credit because the community will judge me as poor	4.46	0.587	3.98	1.083
There is favoritism in issuing credit	4.04	1.057	3.05	1.322
Do not take credit because it will not make any changes in my livelihood	4.32	0.683	3.74	1.086
Credit is for the rich	4.19	1.086	3.25	1.448
Credit is risky	3.65	1.428	2.80	1.505
Religious belief prohibit credit	4.29	0.974	3.05	1.524
Credit is for men only	4.43	0.744	4.09	1.041
Staff members are not friendly and encouraging	4.08	0.933	3.40	0.912
Staff members and leaders reveal the amount of credit that an individual has been availed	4.04	0.929	3.33	0.877
Leaders/board members are not friendly and encouraging	4.05	0.947	3.28	0.932
Do not take credit because of the poor performance of rural financial market in the past	4.05	0.926	3.17	0.963

4.4.10 Distance to rural financial markets

The mean distance covered by heads of household to obtain credit is as shown in Table 55. For the formal financial markets the mean distance is 22.5 km which is the longest, compared to 0.1 km for the informal financial markets, which is the shortest.

The differences in the distance to and from the financial markets traveled by the heads of households in seeking credit might have an effect on access to credit and the amount of credit the heads of households get. As the results have already shown, heads of households prefer to use informal financial markets, which are closer to their homesteads for smaller amounts of credit to meet immediate household needs. Formal markets are linked with longer distance, which implies that few heads of households are likely to use them.

In addition, a household that uses this source probably has to request for higher amounts of credit, which has been shown to be used for productive activities.

Table 55: Mean distance to rural financial markets (km)

	Formal	Semiformal	Informal
Mean	22.5	12.6	0.1
Minimum	25	0.0	0.0
Maximum	63.0	63.0	3.0

4.4.11 Period of processing credit

The processing period of credit differs across rural financial markets, as shown in Table 56. The shortest period for processing credit is by the informal rural financial markets. This is as expected since the informal markets do not involve any bureaucracy in obtaining credit, unlike the semiformal and formal markets. This may be one of the reasons why most of the heads of households use informal sources of credit. According to Aryeetey and Udry (1997) findings, small scale farmers prefer to collect credit from the informal sources because of the nature and services provided, which tend to be better than for other types of rural financial markets. However the longest period of approval of credit is in the semi-formal financial markets that may tend to discourage access to credit.

Table 56: Number of days for processing credit in the financial markets

Type of financial market	Application			Approval		
	Formal	Semiformal	Informal	Formal	Semiformal	Informal
Minimum	1	1	1	1	1	1
Maximum	4	2	2	40	60	1.5
Mean	1.80	1.05	1.05	17.70	12.81	1.2

Collection of cash after Approval			
Type of financial market	Formal	Semiformal	Informal
Minimum	1	1	1
Maximum	1	7	1
Mean	1	1	1

4.4.12 Number of times to and from rural financial markets

The number of times that it takes the head of household goes to the financial market before credit is obtained is lower for the informal financial markets than for the semiformal and formal financial markets, as shown in Table 57. The reason that account for these results is that there is no bureaucracy in the processing of credit from the informal rural financial markets, as already alluded to. This finding conforms with Beckers' Household Production Model, whereby individuals prefer to use a commodity that has less allocation of time in order to maximize utility (Pollak 1985).

Table 57: Number of times to and from financial markets

	Formal	Semiformal	Informal
Minimum	1	1	1
Maximum	4	5	2
Mean	2.6	2.2	1.5

4.4.13 Opportunity cost

The number of days the heads of households took to and from the respective financial market times the real wage per day the individual could have received is presented in Table 58. The average opportunity cost of time spent by heads of households participating in the informal rural financial markets is lower than the other types of financial markets that heads of households participate in. The opportunity cost of time is lower in the informal financial markets as less time is taken in processing credit compared to the formal and semi-formal financial markets. This may be an additional reason for the preference of informal financial markets for accessing credit.

Table 58: Opportunity cost of participating in financial markets in TSh

	Mean	Minimum	Maximum	Standard deviation
Formal	7 800.00	3 000.0	12 000.0	2 529.8
Informal	4 305.30	3 000.0	6 000.0	1 493.0
Semiformal	6 650.90	0	15 000.0	2 151.6

4.4.14 Borrowers transaction costs

The borrowers transaction cost incurred by the heads of household who took credit is calculated as shown in Section 3.5.3. Table 59 shows a comparison of the average transaction costs incurred by heads of households from participating in formal, informal and formal rural financial markets. As shown in the table, there is a significance difference in borrowers' transaction costs incurred in the respective financial markets. The borrowers' transaction costs for heads of household with access to credit are higher than those incurred by the heads of household with no access to credit. These findings imply that heads of household that have access to credit are prepared to incur higher costs in order to obtain credit compared to the heads of household with no access to credit. The reason for this is that small scale farmers who need credit do not take into account the costs incurred in obtaining credit, their major interest is the credit which they are in need of.

However, the average aggregate transaction costs incurred by the heads of household in the financial markets differ. The transaction costs for the informal rural financial markets are lower than the semi-formal and formal rural financial markets. The borrowers transaction costs incurred in informal financial markets are the lowest compared to the semi-formal and formal financial markets. Such findings reflect why heads of household prefer informal rural financial markets compared to the semi-formal and formal financial markets. These finding reveal that borrowers' transaction costs in the respective financial markets influence access to credit.

Table 59: Mean borrowers transaction costs in TSh

	Access			No access		
	Formal	Semiformal	Informal	Formal	Semiformal	Informal
Mean	21 083.30	10 656.70	57 382.00	11 000.00	10 309.90	47 282.10
Minimum	11 500.00	7 000.00	3 000.00	33 000.00	4 000.00	3 000.00
Maximum	79 000.00	26 500.00	10 300.00	33 000.00	22 000.00	850 000.00

Furthermore, the summary statistics in Table 60 show that there is a significant difference between heads of households with access to credit and those with no access to credit on the net difference between the credit amount and transaction costs. The net difference for heads of households who have access to credit is higher in the informal and formal financial markets than for the heads of households with no access to credit. However, it is higher for the heads of household with no access to credit in the semiformal market. The results suggest that heads of household with access to credit are probably taking larger amounts of credit from the informal and formal financial markets than the heads of household with no access to credit. This may be an indication that heads of household with access to credit are wealthier; hence they take credit from informal and formal financial markets for investment in activities like livestock keeping and small business. However for the semi-formal financial markets, the net difference for heads of household with no access to credit is higher than that of the heads of household with access to credit. These results may be suggesting a similar situation as above for the heads of household with no access to credit in that they may be taking larger amounts of credit from the semi-formal financial markets than the heads of household with access to credit.

The mean credit amount as a percentage of the total transaction cost for heads of household with access to credit show that the percentage for the informal rural financial markets (44%) is higher than for the other types of financial markets. This shows that the transaction costs per credit amount are smaller in the informal rural financial markets than in the semi-formal and formal rural financial markets. Perhaps this may be one of the

reasons why small scale farmers give preference to informal financial markets over the semi-formal and formal rural financial markets.

Table 60: Average difference between credit amount and transaction costs (TSh)

	Access			No access		
	Formal	Semiformal	Informal	Formal	Semiformal	Informal
Mean	928 916.60	335 948.20	126 460.70	239 000.00	431 410.04	97 871.80
Minimum	288 500.00	24 500.00	-(53 000.00)	150 000.00	18 000.00	- (48 000.00)
Maximum	1 800 000.00	1 989 000.00	1 130 000.00	367 000.00	2 686 000.00	1 047.00
Average Credit amount as a percentage of transaction cost	4.7	7.9	44.2	8.3	7.8	40.4

4.4.15 Conditions for acquiring credit

The conditions for obtaining credit differ from one financial market to another, as most of the financial markets tend to have monopolistic characteristics. Table 61 shows the conditions required by formal financial markets in relation to access for credit. The results show that the highly ranked conditions are to have an account with the financial market. Other conditions, which apply specifically to MUCOBA, which provide credit through groups, include membership, conducting meetings and approval by group members.

In relation to access, the results show that a higher percentage of the heads of households who have access to credit can meet the conditions required relative to those who have no access to credit, an indication of a higher probability by the heads of household with access to credit to meet the conditions of the formal financial markets than those that have no access to credit. The implication from the results is the conditions set by the formal financial markets based on having individual accounts and savings tend to reduce the chances of small scale farmers to access to credit. Small farmers may be preferring conditions based on group lending, such as attending training and approval of groups members because in addition to acceptable conditions, they incur lower transaction costs.

Table 61: Percentage share of conditions required by formal financial markets

Condition	Access		No access		Total
	Freq	%	Freq	%	%
Membership	4	100	0	0	100
Save	7	87.5	1	12.5	100
Meeting	4	100	0	0	100
Attend training	0	0	4	100	100
Approval of group members	0	0	4	100	100
Open an Account	9	100	0	0	100

Percentages are based on respective variable due to multiple responses

Table 62 shows the conditions required by semiformal financial markets in order to get credit. It is shown that there is a significant difference between heads of households who access credit and those who do not. The heads of households with access to credit indicate a higher possibility of meeting the conditions compared to those with no access to credit given higher percentage rates by heads of household with access (more than 50%) for the specific conditions. However the low percentage responses by the heads of household with no access to credit tend to imply that in order to improve access, the semi-formal financial markets need to review the existing conditions for obtaining credit.

Table 62: Percentage share of conditions required by semi- financial markets

Conditions	Access		No access		Total	Total %
	Freq.	%	Freq.	%	responses	
Membership	77	69	24	31	111	100
Membership fee	80	76	25	24	105	100
Shares	57	79	15	21	72	100
Savings	79	76	25	24	104	100
Meetings	22	96	1	04	23	100
Attend training	15	68	7	32	22	100
Approval of group members	12	80	3	20	15	100
Insurance	5	71	2	29	7	100

Percentages are based on respective variable due to multiple responses

Table 63 shows the conditions required by the informal financial markets (which include also *Kiarano* and VICOBA). The results show that more heads of households with access to credit meet the conditions than those with no access. This shows why informal financial markets are used by most of the heads of households who have access to credit. According to the findings of this study, the conditions required by the informal financial markets are easy to meet and thus, may be facilitating access to credit.

Table 63: Percentage share of conditions required by informal financial markets

Conditions	Access		No access		Total	Total %
	Freq.	%	Freq.	%	responses	
Membership	68	80	17	20	85	100
Membership fee	58	84	11	16	69	100
Save	67	80	17	20	84	100
Meeting	65	98	1	02	66	100
Attend training	38	75	13	25	51	100
Approval of group members	65	82	14	18	79	100
Insurance	35	97	1	3	36	100
Application letter	1	50	1	50	2	100
Assurance to pay	7	70	3	30	10	100

4.4.16 Savings

4.4.16.1 Household savings

Heads of households save in different form that is either in monetary (cash) or non-monetary forms for transitory or precautionary purposes; or for future consumption. The non monetary savings include livestock, crops and trees. Table 64 shows the different types of home savings and the percentage of heads of households that have saved in those forms. Trees were found to be the leading type of home savings for both categories of those with access to credit and no access to credit while the difference in the two categories was found to be marginal. Hence, the results as to whether savings influence access to credit were inconclusive.

Table 64: Distribution of household savings by type

	Access		No access	
	Freq	%	Freq	%
Trees	140	20.0	88	19.2
Cows	75	10.7	33	7.2
Goats	87	12.5	56	12.2
Chicken	123	17.7	73	15.9
Cash	102	14.7	86	18.9
Sheep	27	3.9	22	4.8
Pigs	54	7.7	36	7.9
Maize	83	11.0	61	13.3
Beans	3	0.4	0	0.0
Coffee	2	0.2	0	0.0
Groundnuts	1	0.1	0	0.0
Sunflower	0	0.0	3	0.5
Paddy	1	0.1	0	0.0
Total	698	100	458	100

4.4.16.2 Value of savings at household level

The value of various forms of household savings kept at home were computed by taking into account the existing market price of the commodity when the survey was conducted in the respective areas. Table 65 is a summary of savings, in terms of the average value of home savings. It was found that heads of households who have access to credit have higher average value of savings than heads of household with no access to credit. The significant difference in the average value of home savings between the heads of household with access and those with no access to credit tends to suggest that heads of household with higher value of savings have access to credit compared to heads of household with no access to credit. The higher value may be linked to them being wealthier. Thus, the value of home savings is shown to have an influence on access to credit. Moreover, the biggest value of savings is in form of cash. This suggest that rural financial markets need to formulate strategies for mobilizing these cash savings so that they may deposited in semi formal financial markets so as to increase access to credit. In addition depositing cash in semi-formal financial markets may enhance security against disasters.

Table 65: Average score value of home savings in TSh

	Access		No access	
	Maximum	Mean	Maximum	Mean
Cows	2 800 000.00	361 111.11	6 000 000.00	254 887.21
Goats	2 400 000.00	156 345.00	1 800 000.00	95 443.60
Chicken	1 750 000.00	73 473.60	700 000.00	46 150.37
Pigs	1 800 000.00	217 309.90	2 400 000.00	114 360.90
Maize	2 500 000.00	104 649.10	5 600 000.00	120 187.96
Cash	105 000 000.00	2 890 994.10	36 000 000.00	1 802 398.49
Trees	900 000.00	28,304.09	390 000.00	13 233.08
Beans	700 000.00	6 549.70	0	0
Groundnuts	100 000.00	58 4.7953	0	0
Paddy	500 000.00	3 759.39	0	0
Coffee	40 000.000	300.75	0	0

4.4.16.3 Savings in rural financial markets

A few heads of households keep their savings in rural financial markets, as shown in Table 66. These savings differ among financial markets between heads of households with access and those with no access. It is indicative that the heads of households who have savings in the rural financial markets are the ones who also access credit. However, most of the heads of the households were found to save in SACCOS. The reason may be that SACCOS are the only rural financial markets that have safe custody for monetary savings. In addition, SACCOS accept larger amounts of voluntary savings relative to other rural financial markets.

Table 66: Proportion of savings by type of financial market

	Access		No access	
	Freq	%	Freq	%
SACCOS	54	50.0	20	62.5
VICOBA	23	21.3	0	0.0
Kiarano	13	12.0	4	12.5
NMB	4	3.7	3	9.3
CRDB Plc	2	1.9	0	0.0
ROSCA	0	0.0	1	3.1
MUCOBA	7	6.5	1	3.1
FINCA	5	4.6	3	9.3
Total	108	100	32	100

Furthermore, Table 67 shows the deposits in the rural markets that include savings, shares and demand deposits, which may also be considered as savings. The average amount of deposits for the heads of household with access is higher than the average amount of deposits for the head of households with no access to credit. The difference in the indicated amount of savings between heads of households with access to credit and those without access to credit tends to suggest that the former may have more regular income, which they use to maintain consumption. For this reason part of their current income is saved to meet conditions of getting credit and for future consumption.

Table 67: Average amount of deposits in financial markets in TSh

	Access		No access	
	Maximum	Mean	Maximum	Mean
Savings	1 500 000.00	160 038.01	2 000 000.00	57 954.90
Demand Deposits	200 000.00	42 98.20	80 000.00	1 774.40
Shares	50 000.00	15 643.30	50 000.00	3 195.50

4.4.16.4 Rural savings by sex

Table 68 reveals that they are differences in savings between male and females. Both male and female heads of households who have access to credit have more savings in monetary terms than the heads of households with no access to credit (both male and female). Focusing on sex, and access to credit, male heads of household had more savings in monetary terns both at home and in the rural financial markets, likewise in the category of those with no access to credit. The amount of savings by female heads of households is lower perhaps because they have less wealth, which implies that most of the income they earn is used to meet current consumption. This tends to indicate that of the chances of females accessing credit would be in cases where savings are not considered as collateral.

Table 68: Mean household savings in monetary terms by sex in TSh

		Female			Male		
		Rural financial markets	Home Savings	Total Savings	Rural financial markets	Home savings	Total savings
No access (N=133)	Mean	19 466.66	503 100.00	522 566.66	75 582.52	3 120 388.34	3 195 970.87
	Std. dev.	67 649.57	572 280.15	573 129.92	240 323.61	6 008 454.79	612 3001.82
	Minimum	0	0	0	0	0	0
	Maximum	360 000.00	2 155 000.00	2 155 000.00	2 000 000.00	37 300 000.00	38 255 000.00
Access (N = 171)	Mean	111 592.59	1 151 537.03	1 263 129.62	211 542.73	4 870 880.34	5 082 423.07
	Std. dev.	181 494.99	1 099 979.05	1 173 331.94	316 127.94	12 654 910.98	12 699 943.16
	Minimum	0.00	107 000.00	107 000.00	0	150 000.00	150 000.00
	Maximum	1 050 000.00	5 800 000.00	6 300 000	150 0 00 000.00	1 060 000.00	151 060 000.00

4.4.16.5 Savings and age

The value of total households' savings in relation to age is shown on Fig.7. From the figure it is evident that at the early age of between 21-30 years the savings are lower, they are shown to be higher at the age of 31-40 years. However, the average total savings are lower for heads of households with 41 years and above. These results tend to suggest that at the early age of the lifecycle small scale farmers may be earning income but most of the income earned is not saved. With regard to the intermediate stage, in this case between 31 and 50 years, small scale farmers have more savings because this is the period where they are very productive and need to save for transitory and precautionary purposes, in spite household expenditure being relatively high. From the age of 51, small scale farmers are likely to be earning relatively lower incomes, thus their ability to save is curtailed. These results are consistent with the life cycle hypothesis that in the early ages savings are lower but they increase in the intermediate age and later on decline. This may be the reason why small scale farmers who are aged were shown to prefer to access credit from informal rural financial markets, so as to smooth consumption and investment. Those in the middle ages are shown to access credit from various sources; this is perhaps facilitated by the finding that they are able to save more than other age groups.

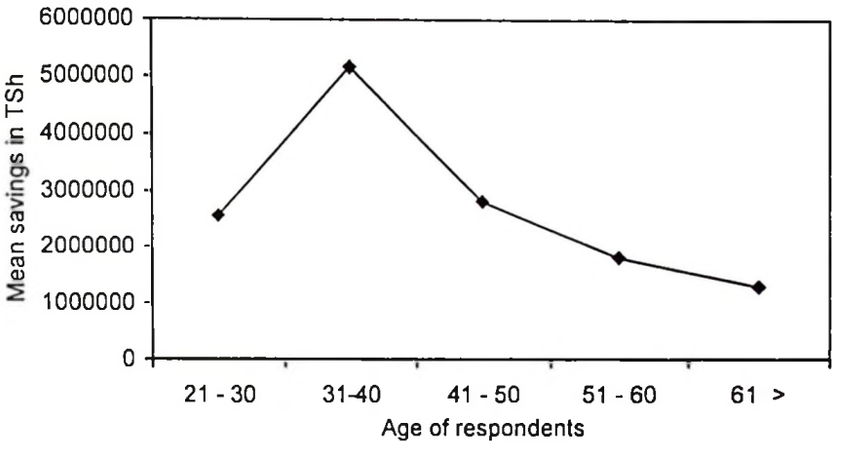

Figure 7: Mean household savings by age

4.4.17 Social capital

This section reports and discusses results with respect to various components of social capital, including trust, information sources, networks, and participation in community activities.

4.4.17.1 Trust on community members

Table 69 shows how heads of households trust different groups of people in the community by the respective mean scores. The mean scores of the heads of households who have access to credit are generally higher compared to those without access to credit. This indicates a positive association between trust and access to credit. In relative terms, the heads of households with access to credit trust more different groups of people in the community than those who do not access credit.

Table 69: Mean trust group score value per factor

	Access (n = 171)		No access (n =133)	
	Mean	Std dev.	Mean	Std dev.
Trust family members	4.6	1.4	3.88	1.46
Trust people from same ethnic	4.6	1.4	3.47	1.41
Trust people from other ethnic group	4.5	1.4	3.23	1.46
Trust people in the same financial market	4.5	1.3	2.95	1.21
Trust shopkeepers	4.5	3.4	3.23	1.30
trust ward and village officials	4.4	1.34	3.17	1.40
Trust police	4.3	1.29	3.11	1.30
Trust teachers	4.6	1.39	3.38	1.40
Trust nurses and doctors	4.6	1.38	3.32	1.41
Trust staff of rural financial market	4.4	1.34	3.05	1.24
Trust people who belong to the same religion/dominion	4.6	1.47	3.42	1.38
Trust village committees	4.5	1.36	3.29	1.38

Std.dev stands for standard deviation

Furthermore, Table 70 shows how the heads of households trust leaders in the community. The results show that heads of household with access to credit had a higher level of trust to leaders compared with those who had no access to credit. Again, this is an indication of a positive association between trust and access to credit; the heads of households with access to credit trust more the leaders in the community than those who do not have access to credit. Particularly, the results show that the means between heads of households with access to credit and those with no access to credit with regard to trust of financial market leaders are different, whereby those who have no access were found to have relatively lesser trust of the rural financial market leaders.

Table 70: Average trust leaders score value per factor

	Access (n = 171)		No access (n = 133)	
	Mean	Std. dev	Mean	Std dev.
Trust community official leaders	4.5	1.428	3.2	1.439
Trust leadership approaches of community official leaders	4.5	1.420	3.1	1.459
Trust traditional/clan leaders	4.6	1.370	3.3	1.432
Trust leadership approaches used by traditional/clan leaders	3.6	1.366	3.3	1.416
Trust leaders of rural financial markets	3.5	1.314	2.9	1.237
Trust leadership approaches of leaders of financial markets	3.6	1.313	2.5	1.246
Trust leaders of religious groups	4.8	1.336	3.5	1.439
Trust leadership approaches of religious leaders	4.7	1.332	3.4	1.439
Trust leadership approaches of informal groups	4.3	1.252	3.00	1.237
Trust councilors	3.5	1.410	3.2	1.395
Trust leadership approaches of councilors	3.5	1.414	3.2	1.420

The results on the overall Trust Index are summarized in Table 71, which shows that the mean score for all the trust indices are higher for the heads of households who had access to credit than for those who had no access to credit. These results may be interpreted to indicate that small scale farmers in rural areas who have trust on various groups of people and leaders have a higher probability of accessing credit. Therefore, there is likelihood that trust, as a component of social capital, has influence on access to credit.

Table 71: Mean scores for trust indices

	No access (n=133)			Access (n=171)		
	Trust groups of people	Trust Leaders	Trust people index	Trust groups of people	Trust Leaders	Trust people index
Mean	2.9	3.04	2.85	4.59	4.90	4.59
Std. dev	1.137	1.272	0.723	1.259	1.302	0.659
Minimum	1.17	1.09	1.00	1.00	1.09	2.00
Maximum	4.8	5.0	4.7	7.58	7.45	8.00

4.4.17.2 Sources of information

Table 72 summarizes the different sources on general information used by the heads of households. The results indicate that the mean scores for the heads of household with access to credit are higher compared to those of the head of households who had no access to credit. This implies that there is an association between sources on general information used by the heads of households and access to credit. Thus, general sources of information is shown to be a positive factor of social capital; hence, households with access to credit are more likely to capitalize on this form of social capital and be able to access to credit. The use of mobile phones as a means of information seems to be an expanding means of disseminating information over time that may increase networks and therefore social capital amongst small scale farmers. This is likely to lead to more small scale farmers accessing credit from rural financial markets. More information more likely increases their confidence than lack of it; as well, it is likely to increase confidence to small scale farmers, thereby improving access to credit.

Table 72: Mean score values on sources of information

	Access (n =171)		No access (n =133)	
	Mean	Std. dev.	Mean	Std. dev.
Attend village meetings	4.62	0.922	2.59	.895
Attend places of worship	4.42	1.471	2.95	1.655
Attend clan meetings	4.26	1.322	2.20	1.386
Listen to the radio	4.91	1.368	2.28	1.653
Attend meetings of semiformal rural financial markets	4.58	1.738	2.51	1.627
Go to the market	4.58	1.518	2.23	1.439
Attend meetings of informal rural financial markets	4.29	1.864	2.32	1.698
Get information by mobile phones	4.91	1.794	2.35	1.679
Attend political campaigns/meetings	3.93	1.675	2.67	1.585
Watch television	2.13	1.437	1.14	.995
Read newspapers	2.09	1.334	1.13	1.122

4.4.17.3 Sources of information on credit

Small scale farmers in the rural areas get information on credit from various sources, as shown in Table 73. The table shows the first source of information on credit sources for the heads of houscholds in the study area. The results shown indicate slight differences the first information source on credit access between heads of households who have access and those with no access to credit. A large proportion of heads of households in both categories received first information on credit from village meetings, friends and neighbors than from any other source. Religious gatherings was another first source, but it was only so with heads of households who had access to credit.

Table 73: Distribution of first source on credit information

	Access		No access	
Source of Information	Freq.	%	Freq.	%
Attending village meetings	54	39.2	31	42.5
Campaigns on RFM	12	8.7	4	5.5
Training offered by RFM/NGO/Government	8	5.8	0	0.0
Friend	16	11.6	15	20.5
Neighbors	5	3.6	11	15.0
Children	3	2.2	0	0.0
Relatives	3	2.2	4	5.5
Radio	2	1.4	0	0.0
Village/ward/notice boards	9	6.5	4	5.5
Religious gatherings	26	18.8	4	5.5
Total	138	100	73	100

4.4.17.4 Urgent source of credit

Urgent sources of credit are considered as the sources from which heads of households can obtain credit if they are in pressing need. Table 74 indicates the sources of credit that are used by heads of households when they are in urgent need of credit. As shown in the table, there is no difference between the heads of households who have access to credit and those that do not have access to credit. For both categories, the leading urgent source of credit is friends within the village. The use of friends as an urgent source of credit, suggests that heads of household have created strong networks within the village that enhance trustworthiness.

Table 74: Categories of urgent sources of credit

Type of financial market	No access (n=133) (%)	Access (n = 171) (%)
Informal source		
Children	2.3	4.7
Friends within village	49.6	40.9
Relative	17.3	11.1
Friends from other villages	1.4	.0
Kiarano	2.3	6.4
None	9.0	5.8
Religious *jumuiya*	9.8	8.8
Neighbour	7.5	5.3
Women group	.0	2.4
VICOBA	.8	14.6
Total	100	100
Semi-formal source		
SACCOS	6.0	12.9
Financial NGO	.0	1.1
None	94.0	86.0
Total	100	100
Formal source		
MCB	1.5	2.9
None	98.5	97.1
Total	100	100

4.4.17.5 Social position in the community

In this study the head of household's involvement in solving community issues was taken as a proxy of his or her social position in the community. Table 75 shows the relationship between social positions, sex and access to credit, as indicated by the percentages in relation to access on credit. With regard to female, 74.4% of those who have access to credit are involved in solving community issues compared to 59.1% for male. In general, small scale farmers involved in solving community issues, have a higher possibility of accessing credit than those not involved in solving community issues. The reason for this may be that solving community issues enhance information and networks, which in turn creates a higher level of social capital that leads to higher chances of accessing credit.

The sex dimension with regard to solving community issue was also indicative in the percentage of female heads of households involved in solving community issues and have access to credit is higher than that of males in the same category. This implies that female small scale farmers that are involved in solving community issues are more likely to access credit than male counterparts. The differences on gender reflect that female small scale farmers, when given the opportunity to solve community issues, create stronger networks, which increase social capital that facilitates them to access credit. Hence, the finding of the study is that there is positive relationship between social capital, solving community issues and sex of the head of household.

Table 75: Proportion on heads of household with social position by sex

	Involvement in solving community issues	No access		Access		Total
		Freq	%	Freq	%	
Female	No(not involved)	20	44.4	25	55.6	45
	Yes (involved)	10	25.6	29	74.4	39
Male	No (not involved)	40	60.6	26	39.4	66
	Yes (involved)	63	40.9	91	59.1	154

4.4.17.6 Membership, networks and social capital

Reported results have already shown that the relationship between networks and membership on social capital is positive; that they enhance chances of accessing credit. Table 76 summarizes these findings with the mean scores, in relation to membership index, networks and access to credit. The scores were found to be higher for heads of households with access to credit than for heads of households with no access to credit. These results may be an indication that heads of households with more networks and who are also members of various associations in the community have higher levels of social capital that facilitate them to access to credit. Thus, networks create stronger horizontal ties within the communities which, in turn facilitate access to credit.

The social capital index, which is a composite index of the information index, membership index, networks and social position of the heads of households is also shown in Table 74. The results indicate that heads of households with access to credit have higher mean scores of social capital compared to the heads of households with no access to credit. Since heads of households with access to credit have been shown to have higher chances of access to credit in the reported results, then it is possible that their possessing of social capital is a factor that enables them to access credit from any source.

Table 76: Mean score values of membership, networks and social capital indices

	No access (n = 133)			Access (n = 171)		
	Membership	Networks	Social capital	Membership	Networks	Social capital
Mean	2.3	8.7	13.8	3.6	10.0	16.6
Std. dev	1.1	2.7	3.7	1.6	3.6	4.7
Minimum	.0	4.0	7.0	1.0	3.0	7.0
Maximum	6.0	16.0	24.0	9.0	19.0	29.0

4.4.17.7 Social capital and sources of Credit

Table 77 shows the relationship between social capital and sources of credit. Amongst the informal rural financial markets, the mean scores of VICOBA are higher than of other sources. The high scores are due to the level of trust that is embedded within informal institutions, which in turn implies higher social capital, and consequently the facilitating of access to credit. With regard to semi-formal rural financial markets, the mean score of SACCOS is higher than those of NGOs and SACAS. The higher social capital in SACCOS indicates that member-based institutions that are voluntarily formed by members have a common bond that creates social capital. This suggests that there is a possibility of increasing members in SACCOS if they are well managed. However social capital in the formal sources is difficult to discuss, due to limited access by a small number of small scale farmers.

Table 77: Mean scores for social capital index by sources of credit

	Social capital index			
Financial markets	Mean	Minimum	Max	Std. dev.
Informal financial markets				
VICOBA (n= 36)	20.1	10.0	29.0	4.4
Women group (n= 7)	18.7	11.0	28.0	7.1
Religious *jumuiya* (n= 11)	18.2	10.0	28.0	5.8
Kiarano (n= 34)	17.0	10.0	28.0	4.5
Clan (n= 7)	16.5	10.0	19.0	3.2
R0SCA (n= 8)	15.5	11.0	20.0	3.2
Money Lender (n= 2)	14.0	9.0	19.0	7.1
Father (n= 2)	18.5	14.0	23.0	6.4
Neighbor (n= 13)	15.6	11.0	24.0	4.2
Friends Within Village (n = 54)	15.5	10.0	24.0	3.6
Shop (n= 4)	19.7	16.0	23.0	2.9
Semiformal financial markets				
SACCOS (n= 75)	17.6	8.0	29.0	4.9
SACA (n= 4)	15.7	14.0	17.0	1.3
Financial NGO (n = 34)	14.0	7.0	20.0	2.9
Formal financial markets				
NMB (n= 4)	16.0	12.0	26.0	6.7
CRDB Bank Plc (n= 1)	28.0	28.0	28.0	
MUCOBA-(n = 6)	16.3	12.0	21.0	3.8

4.5 Probit Estimation of Factors Influencing Access to Credit

The probit regression model was run so as to estimate the effect of basic household characteristics, social capital and borrowers' transaction costs on access to credit. Three regression models were estimated in order to get the effects of the disaggregated social capital and borrower transaction costs variables, taking into account the correlation between the variables, as shown in Appendix 3.

4.5.1 The basic model

The basic household model consisted of variables that may affect access to credit, as summarized in model 1 in Table 78.

Table 78: Results of probit analysis

	Basic Model (Model 1)		Basic model with borrowers transaction cost variable (Model 2)		Basic model with social capital variables (Model 3)	
	Coefficient	Z test	Coefficient	Z test	Coefficient	Z test
Constant	-4.031416	-5.35	-4.469582	-5.94	-4.082386	-3.51
Sex, head of household	-0.5047081***	-2.55	-0.5768955***	-2.89	-0.5959036***	-2.90
Age head of household	0.0346082***	3.89	0.0336702***	3.73	0.0320006***	3.45
Years of schooling	0.0599047**	2.84	0.0496784	1.46	0.0366692	1.01
Children out of home	0.0336702***	3.73				
Household disposable income	-5.61e-08	-1.14	-8.19e-08	-1.49	-6.22e-08	-1.08
Attitude index	0.6673427***	4.31	0.6935783***	4.32	0.6384644***	3.86
Knowledge index	0.1098607***	2.22	0.0729544	1.32	0.0527285	0.89
Household size	-0.0976959***	-2.31	-0.0709835**	-2.14	-0.1015408***	-2.28
Total land	-0.0634364***	-2.27	-0.0614647 ***	-2.13	-0.0655399***	-2.12
Wealth index	0 .0692195**	2.68	0.0953742 ***	2.28	0.0858424**	2.04
RFM savngs	-1.54e-07	-0.40	-4.88e-08	-0.13	-3.41e-07	-0.81
Home savings	0.0954969	1.22	0.1460865**	2.16	1222785	1.47
Aggregate borrowers transaction cost	-0.0000108***	2.31				
Borrowers transaction semi-forml			0.0000496**	2.72		
Borrowers transaction cost informal			0.0000106***	-2.28		
Borrowers transaction cost formal			0.0000262	1.25		
Social capital Index	0.8243644***	2.11				
Social position of the head of household					1.731308***	5.79
Membership index					0.6384644***	3.86
Total networks					0.0402487**	2.35
Informaation index					0.057519 ***	2.55
Thrust index					0 .0289047	0.2
Maximum likelihood	-141.85275		-146.4127			-141.85275
R^2	0.2859		0.2972			0.3191
Chi square	91.95		89.82			108.58
No. of observations	304		304			304

The dependent variable is access to credit by the rural households (1= have access; 2=no access), ***Significant at 1% level, **significant at 5% level.

The Chi-square which describes the goodness of the model is 91.95, log likelihood is (-141.85), which is significant at 1% level. The coefficient on sex is negative and significant at 1% level. This is contrary to the *a priori* expectation that male headed households have a greater likelihood of accessing credit. Such results are not expected in culturally male dominated societies. Furthermore, female headed households are willing to access credit as most of the sources available prefer human or small amounts of savings as collateral. In addition, it is likely that female headed households are faced with cultural and economic constraints such that when they get empowered, access to credit becomes a solution.

Age is positively significant at 5% level. The positive sign is in conformity with the hypothesized sign. Thus, as age increases, the probability of accessing credit also increases. This implies that aged heads of households have a higher likelihood of accessing credit, possibly due to the social capital they have created within the community and physical collateral they possess.

The coefficient on years of schooling variable, a proxy of the level of education, is positive and significant at 5% level. The sign is in conformity with the a priori expectation. This suggests that the level of education influences access to credit. Thus heads of household with higher level of education have a higher possibility of access to credit.

For sons and daughters, the coefficient on children for those residing out of the village is positive and significant at 1% level. This implies that households that have children residing out of the village have a higher possibility of accessing credit. It is perceived that such households receive remittances from their children, which enable them to access credit. The remittances could be used as collateral by the respective households.

Attitude towards credit is positive and significant at 1% level and is in conformity with the hypothesized sign. These results suggest that households with positive attitude towards credit are likely to access credit. Thus, if small scale farmers were to change their attitude towards credit, more of them would be willing to access credit. These findings support Godwin (1997) who also found that positive attitude towards resources increases the possibility of accessing the resources.

Knowledge of the respondents on credit also influences access to credit, as was indicated by the positive coefficient on the Knowledge variable, which is significant at 5 % level. The sign for the coefficient is in agreement with the a priori expectation. This implies with increased knowledge on credit, small scale farmers will have more chances of accessing to credit.

The coefficient on total land size of the respondents is negative and significant at 1% level, although the sign of the coefficient is not as hypothesized. This implies that, small scale farmers with smaller plots tend to have access to credit more than small scale farmers who own larger plots of land. The reason may be that small scale farmers with smaller land size have a low capital base and therefore they need to access credit as a compensatory alternative. In addition, it is likely that small scale farmers with small plots have low crop yields and are therefore willing to look for alternative income generating activities, for example livestock keeping and small business as complementing sources of livelihood.

On the other hand the coefficient on wealth is positive and significant at 5% level. The sign of the coefficient is as hypothesized. Hence wealth increases the likelihood of access to credit as it is considered a security.

It was found that that the coefficient of home savings (either in the form of crop output, cash livestock or trees) is positive and significant at 5 % level, which is as hypothesized. Hence, it is likely that having more savings at home increases the possibility of accessing credit, which may be implying that savings kept at home are considered collateral that provides confidence to access credit.

The coefficient for aggregate borrowers' transaction costs is positive and significant at 5% level. The sign of the coefficient conforms to the hypothesized sign. These results suggest that an increase in the borrowers' transaction costs will decrease access to credit. Thus small scale farmers have a likelihood of not accessing credit from financial markets with high borrowers' transaction costs.

Lastly, the aggregate social capital coefficient is positive and significant at 1 % level. The sign of the coefficient is as hypothesized. This implies that households with higher social capital have a possibility of accessing credit. This suggests that households with high social capital are trusted and have strong networks that enable them at access credit.

4.5.2 Disaggregated borrowers transaction costs

The disaggregated borrowers transaction costs variables are introduced in the basic household model to examine which type of financial markets truly increase the likelihood of accessing credit, as is shown in the third model. The disaggregated borrowers' transaction costs model is as shown in Table 78. The log likelihood function is -146.4127 and chi-square, χ^2, is 89.82 and significant at $p<0.05$. This model shows the borrowers' transaction costs of the rural financial markets. The separation shows that the coefficient on borrower's transaction costs of informal markets is negative and significant at 1%.

Thus, decreased borrowers' transaction costs in informal financial markets are likely to increase the possibility of accessing credit from the informal financial markets and formal financial markets. These results also indicate that heads of households have embedded trust in the informal rural financial markets that are within their vicinity.

4.5.3 Disaggregated social capital

The disaggregated social capital variables are introduced in the basic household model to capture the dimensions of social capital that truly increase the likelihood of accessing to credit, as is shown in the third model in Table 78. The log likelihood function is -141.85275, and the chi-square is 108.58; as well, the model is significant at 5 % level. The social capital index is disaggregated into the membership index, sources of information index, total networks and trust groups of people index. The variables membership index, social position and information index are significant and positive at 1% level, whereas total networks is positive and significant at 5% level. The positive sign and significance of the membership index variable implies that an increase of the household membership in local organizations or groups increases the likelihood of accessing credit. In addition, households that use more sources of information are likely to have access to credit as the coefficient is positive and significant at 5% level of significance. Households with more networks are also likely to increase the possibility of accessing credit. Furthermore, heads of household having positions and responsibilities in the community are likely to have increased access to credit.

4.5.4 Marginal probability on access to credit

Table 79 shows the marginal probabilities of the variables in relation to access. The marginal probability of social capital is the highest of all the variables. This tends to imply

that perhaps social capital has a great influence on access to credit in rural areas. Thus, households with social capital have a higher possibility of accessing credit than those that do not have. This is probably the reason of increased use of informal financial markets.

Table 79: Marginal probabilities on access to credit

Variable	Marginal probabilities
Sex of head of household	0.02
Age of head of household	0.01
Years of schooling	0.02
Children out	0.06
Household disposable income	0.01
Attitude index	0.26
Knowledge Index	0.05
Hhsize	0.02
Total land	0.02
Wealth index	0.03
Social capital	0.31
Borrowers transaction costs	0.16

4.6 Effect of Access to Credit on Livelihood

The independent two-paired sample t-test was used to test the whether there is a statistical difference between the means of respondents who had access to credit and those that had no access to credit for selected variables, in order to gauge the extent to which these variables improve livelihood, as shown in Table 80. The calculated "t" value for wealth index, knowledge index, education level of head of household, attitude index, credit delivery methods, borrowers' transaction costs semi formal financial market, borrowers' transaction costs informal financial market, social capital index, wealth index, membership index, social position is greater than the table value of 1.98 and are also significant at 5 % level. Since the variables are significant at 5 % level, we therefore deduce that there is a significant difference of the means of these variables between respondents with access to credit and respondents with no access to credit.

Table 80: Access to credit and livelihood

	Access (n = 171)		No access (n = 133)		Mean Difference
Variable	Mean	Std. Error	Mean	Std. Error	T Test
Knowledge Index	5.13	0.146	3.38	0.165	7.9155*
Education level of head of household	6.99	0.26	5.69	0.258	3.4778*
Attitude Index	4.19	0.046	3.5	0.064	9.0486*
Borrowers Transaction Costs Semi- formal financial market	5047.94	476.26	1968.04	380.735	4.8427*
Borrowers Transaction Costs Informal financial market	10888.89	1670.28	5691.73	1488.629	-2.2551*
Borrowers Transaction Costs formal financial market	926.9 0	522.056	248.12	248.121	1.0753
Credit delivery methods	2.08	0.142	3.41	0.116	7.302*
Household Size	6.15	0.193	6.57	0.212	-1.5289
Social Capital Index	0.98	0.021	0.81	0.019	5.6700*
Wealth Index	0.19	0.375	-2.15	0.177	4.3081*
Disposable Income	881885.6	77655.23	898408.6	204566.1	0.0823
Membership Index	3.61	0.123	2.36	0.100	7.5084*
Total networks	10.09	0.273	8.75	0.238	3.5879*
Total Land owned	2.951	0.262	3.413534	0.3072662	-1.1488
Social Position	0.702	0.035	.5488722	0.043311	2.7720*
House hold savings	369	811685.1	2530023	468354	1.1559

*t critical = 1.980 and significant at 5% level

Moreover, from these results the significance of social capital means that social capital facilitates access to credit that eventually improves livelihood of the household. In addition, it is also evidenced that the coefficients membership in groups/associations and total number of respondents networks that are embedded in social capital are significant. Hence, these variables are necessary for the rural small scale farmers to enhance access to credit that will lead to improved livelihood of the small scale farmers and poverty reduction.

The coefficient on 'knowledge on credit" variable is significant, implying that knowledge on credit is important for small scale farmers so as to facilitate access to credit. Thus, knowledge on credit has a role to play in the improvement of rural small scale farmers' livelihood. The coefficient on 'years of schooling', which is a proxy for the level of education, is also significant. This implies that respondents' level of education has an influence on access to credit, which implies a possibility of reducing poverty at household

level. Moreover, the significance of the coefficient on 'access towards credit' shows that it has an influence on access to credit and may improve small scale farmers' livelihood.

The coefficient on wealth is significant. This coefficient consists of assets that are owned by the respective households. The significance of this variable is that it indicates that wealth owned by the small scale farmers facilitates access to credit, which in turn would lead to improvement in livelihood.

The coefficient on delivery methods is significant. This coefficient consists of group lending and individual lending methods of credit offered by the rural financial markets. The significance of this variable indicates that credit delivery methods offered by rural financial markets influence access to credit and may improve small scale farmers' livelihood.

Furthermore, the calculated "t" value for household total savings, total land, disposable household income, household size, borrowers' transaction costs-formal financial market were all not significant at 5% level. That is, the mean differences of these variables between respondents with access to credit and those with no access to credit had no statistically significant difference. There is therefore no significant effect of these variables on access to credit. Therefore these variables do not facilitate access to credit and may have no effect on improvement of livelihood.

These results suggest that for rural small scale farmers, social capital, education, knowledge and borrowers' transaction costs on informal and semi-fomal financial markets are essential in facilitating rural small scale farmers' access to credit as a means of improving their livelihood. Furthermore, these findings suggest that income may not facilitate access to credit. Therefore, probably what is more important in facilitating small scale farmers to access credit and improve livelihood is their own capabilities.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

This chapter provides a summary of the study and key findings as well makes some recommendations. The overall objective was to investigate factors that determine access to credit for rural small scale farmers.Specifically, the study identified rural financial markets and credit delivery system and examined the influence of transaction costs and social capital on access to credit among rural scale farmers. Hence, from the results, policy makers could identify appropriate interventions in the rural areas to capacitate and to enable small scale farmers to access credit from rural financial markets.

The primary data were collected from four districts in Tanzania, namely, Rombo District and Moshi Rural District in Kilimanjaro Region and Iringa Rural District and Mufindi District in Iringa Region. A sample of 304 small scale farmers was randomly selected consisting of 171 small scale farmers with access to credit and 133 small scale farmers with no access to credit. The survey covered also some formal, semi-formal and informal rural financial markets that are providing financial services to the rural areas in the selected districts. In addition, secondary data were collected from various institutions involved with the provision of credit. These data were analysed within a conceptual framework that delineates a link between small scale farmers and financial markets on the one hand and policies on credit, a stable political environment and socio-economic and cultural environment on the other.

5.1 Conclusions

The measure of access to credit and associated variables that influence access to credit were capable to indicate relevant outcomes and arrive at decisive conclusions as follows:

(i) Borrowers transaction costs

Borrower's transaction costs were calculated as sum of the expenses and the opportunity cost of time incurred by the small scale farmers to access credit from the formal, semi formal and informal financial markets. A comparison of these costs was made between respondents with access to credit and those with no access to credit, and the results showed that respondents with access to credit had higher transaction costs than those with no access; which indicated the willingness of small scale farmers to incur higher costs in order to access credit. The implication of these results is that, for these small scale farmers, access to credit matters more than the costs they incur to get that credit.

However, the borrowers' transaction costs incurred by the small scale farmers differed among types of rural financial markets. The borrowers' transaction costs for the semi-formal financial markets, that is SACCOS and Financial NGOs such as PRIDE and FINCA, were found to be lower than the formal and informal financial markets. Despite higher transaction costs for formal and informal markets, small scale farmers sourced a large proportion of their credit from informal rural financial markets (see Fig. 4), an indication of a higher preference of accessing credit at higher transaction costs over lower transaction costs that may not ensure accessing credit.

(ii) Social capital

Social capital was defined to include networks, membership in groups or associations, participation in community activities, trust and information sources. Thus, a social capital index that covered all these aspects was constructed for every household in the sample; this social capital index was used to compare the effect of social capital on access to credit between small scale farmers who had access and those who did not have access to credit. It was found that small scale farmers with high social capital tend to have a higher probability of accessing credit than those with low social capital. Thus, social capital bears the potential of improving access to credit by small scale farmers, which when put to use facilitates the improving of their livelihood.

With respect to the types of rural financial markets, that is semi formal, informal and formal, small scale farmers with access to credit from informal financial markets, such as VICOBA, women groups, religious *jumuiya* and *Kiarano,* and the semi-formal financial markets, such as SACCOS, were found to have higher social capital compared to small scale farmers with access to credit from other rural financial markets covered in the survey. These semi-formal and informal rural financial markets are all member-based institutions, formed by members who know one another and probably trust one another. The implication from these findings is that social capital, through its aspects of peer monitoring and screening effects, can facilitate access to credit in rural areas where, owing to information asymmetry, many small scale farmers are still not able to access credit in the financial markets that serve the rural areas.

(iii) Factors influencing access to credit

A probit model of factors that influence access to credit was estimated using econometric methods. The results showed the level of education, knowledge on credit, attitude, age, wealth, home savings, and children residing outside the village to be positively related with access to credit. Thus, small scale farmers with a high level of education, knowledge on credit, and a positive attitude towards credit have a higher probability of accessing credit than otherwise. In addition, wealthy small scale farmers and those with relatively higher amounts of home savings also have a higher probability of accessing credit than those who are not wealthy and those with relatively lower home savings.

Factors found to be negatively related with access to credit included gender, household size, and land. Hence, female headed households in the rural areas have a higher probability of accessing credit than male headed households. This indicates the commitment of female headed households in rural agriculture, despite the cultural and customary constraints they face. In addition households with smaller size of land have a higher probability of accessing credit. This indicates that land constrained farmers tend to seek credit, probably to either improve productivity on their small farms or to engage in off-farm alternative activities of generating income. As for small household sizes indicating a higher probability of accessing credit, it may be possible that due their low dependency ratio, families whose household size is small can commit more time to investment in productive ventures than to consumption, hence they access credit for capital needs; as well, some empirical studies have found a negative relationship between household size and household income (at least in per capita terms); thus, a negative relationship between household size and access to credit may be interpreted as to indicate that poverty is a constraint to accessing credit.

(iv) Credit delivery methods

The credit delivery methods offered by the rural financial markets are group lending and individual lending. Group lending, using the solidarity approach, is used by Financial NGOs, such as FINCA and PRIDE and MUCOBA, a regional bank, whereas VICOBA are using the community-based approach. Individual lending is used by member-based semi-formal markets, namely SACCOS and SACA; it is also used by some informal markets, for example, *Kiarano,* private moneylenders, clans and friends. It was found that most of the small scale farmers showed preference for individual than group lending. These findings imply that rural small scale farmers have strong informal networks or high social capital, which they tend to prefer over the formal networks, which use group lending. Because small scale farmers' high social capital is ingrained in informal networks, they prefer to use the informal financial markets and the respective credit methodologies that they have participated in establishing. As a result, informal rural markets cannot be considered as substitutes of semi-formal and formal rural financial markets; rather, they can be considered as complements to them.

5.2 Recommendations

The following recommendations follow from the analysis of the results and reported findings of the study.

(a) Intervention strategies for credit access

Access to credit by small scale farmers' households was shown to be positively related to several household characteristics, including age, knowledge on credit, education, wealth and savings. Moreover, sex and household size were shown to be negatively related with access to credit. It is suggested that because the characteristics of the household differ,

they could be put into several categories so that intervention strategies for credit access should be targeted, in two ways. One is to target different categories of household characteristics; another is to target groups of small scale farmers with different needs. However, these intervention strategies should not be limited to addressing access to credit, since the end result of accessing credit is to improve the farmers' livelihood. Thus, intervention strategies for credit access should be conceived in a multidimensional approach, with a view to reduce poverty amongst the rural small scale farmers and achieve the Millennium Development Goals.

(b) Education on access to credit

More small scale farmers can be able to access credit if they are educated as to be enlightened on the benefits of access to credit. Benefits of access to credit can be addressed by ensuring that small scale farmers have a positive attitude towards credit and appropriate knowledge on credit. There is a need to disseminate knowledge on access to credit by using platforms that small scale farmers are used to and channels of communication that are cost effective and acceptable. These platforms and channels of communication include village meetings, religious congregations and mobile phones. Such actions can instill a positive attitude on access to credit.

(c) Strengthening small scale farmers' social capital

Social capital has been found to increase the likelihood of small scale farmers of accessing credit. However, very few small scale farmers have access to credit in the existing formal, informal and semi-formal rural financial markets. One of the reasons is incomplete information, which can be bridged by using social capital. Social capital has peer screening, monitoring and collateral effects through networks that the small scale farmers

have established, such as membership in groups, trust on others within the community, and participation in community activities. To reap benefits of these advantages, investment in social capital needs to be part of the intervention strategies that are aimed at expanding access to credit and hence reducing poverty.

(d) Introducing acceptable rural financial markets

The credit delivery methods differed in the formal, informal and semi-formal rural financial markets. It was found that most of the respondents have access to informal financial markets and also take strong participation in them, despite high borrowers' transaction costs. The reason for their preference was found to be the networks, thereby signifying strong social capital that small farmers have established within the informal systems. Thus, intervention strategies on introducing or strengthening rural financial markets are likely to succeed if they capitalize on (as well as strengthen) informal networks that small scale farmers use.

(e) Improving small scale farmers' livelihood

Non income factors and credit delivery methods were observed to improve livelihood. Using farmers' own capabilities is vital in improving livelihood. The credit delivery methods offered by rural financial markets were also found to be crucial in improving small scale farmers' livelihood. It was also found out that small scale farmers prefer individual lending methods that were used by the rural financial markets that are formed by their own initiatives and capabilities. Therefore interventions for facilitating access to credit by small scale farmers need to incorporate non income factors so as to improve livelihood.

5.3 Areas for future Research

Based on the findings from the study, the recommendations for further research will aim at improving access to credit and other financial services provided by the rural financial markets. The following areas for further research are proposed:

a) Research on livelihood and access to credit is important. The importance here is based on the impact of access to credit on rural small scale farmers' livelihood. This research can be conducted in the study area or any other area in Tanzania;

b) Similar studies can be conducted in other communities/ areas with similar or different major activities. Such studies are important because the social and economic environments differ across communities.

c) There is discrepancy on the information of existing informal and semi-formal financial markets in urban and rural areas. Hence there is need of conducting research on the informal and semi-formal financial market architecture and participation of small scale farmers, small scale entrepreneurs, pastoralist and small scale fisherman;

d) There is minimal information on social capital and vertical linkages with focus on informal financial markets and semi-formal financial markets that serve both the urban and rural population. There is need of conducting a multidisciplinary research on the behaviour of financial markets in relation to social capital and vertical linkages in Tanzania.

The research conducted should be formative and supported by stakeholders. Support from stakeholders will facilitate in improving access to credit from the rural financial markets. Furthermore it will lead to strengthening and having acceptable and sustainable rural markets.

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APPENDICES

Appendix 1: Questionnaire on rural small scale farmers' access to credit - Household questionnaire

A. HOUSEHOLD QUESTIONNAIRE

Questionnaire No.....
Mtaa.....
Village.....
Ward.....
District.....

A. Demographic

1. Sex of head of household

1= Female		2=Male	

2. (i) Age of head of household.....
   (ii) Age of spouse.....

3. Marital Status

1=Married Number of wives		3=Divorced/separated	
2=Widowed		4=Never married	

4. Education level of head of household:
   No. of years at school.....

5. Education level of spouse.
   No. of years at school.....

6. Religion of head of household

1=Catholic		3=Muslim	
2=Protestant		4=Others	

7. Occupation of Head of household

1=household work		7=Fishing	
2=crop production		8 = craftsmen	
3=Small business		9 = Tailor	
4=Salaried worker		10=Timber Harvesting	
5=Day labourer		11 = Others, mention	
6=livestock production			

8. Occupation of spouse

1=household work		7=Fishing	
2=crop production		8 = craftsmen	
3=Small business		9 = Tailor	
4=Salaried worker		10=Timber harvesting	
5=Day labourer		11 = Others, mention	
6=livestock production			

9. Number of children and people who reside at the household, sex and age

	Number	Residence		
		At Home	Within the village	Out of the village
0 – 5 **male**				
0 – 5 Female				
6 – 10 **male**				
6 – 10 female				
11 – 17 **male**				
11 – 17 female				
18 – 60 **male**				
18 – 60 Female				
Over 60 **male**				
Over 60female				

B. **Physical assets**

10. Type of house

Walls		Roof		Floor
Bricks		Aluminium Sheets		Mud
Mud		Grass		Cement
Grass		Tin		Tiles
Wood		Tiles		

11. Utilities at household

Electricity	
Tap water	
Well	
Solar energy	
Biogas	

12. Assets owned household

Assets	Number	Cost	Asset	Number	Cost
Radio			Television		
Mobile Phone			Refrigerator		
Bicycle			Watch		
Oxen Cart			Non-mobile phone		
Tractor			Motorcycle		
Oil milling machine			Milling machine		
			Vehicle		

13. Size of land owned

	Size in acres	Value
Cultivated		
Not cultivated		
Livestock		
Rented		
Others		
Total		

Crops and livestock

14. Type of crops grown last season

	Amount harvested in units	Amount sold	Value at market
Maize			
Bananas			
Beans			
Coffee			
Tea			
Potatoes			
Sunflower			
Vegetables			
Tomatoes			
Onions			
Paprica			
Trees			
Others; Specify			

15 Who owns livestock

Type of Livestock	Total amount	1=Wife	2=Husband	3=Children	4=Clan	Others
Traditional Goats						
Dairy goats						
Traditional Cows						
Dairy Cows						
Pigs						
Chicken						
Sheep						
Donkey						
Others; Specify						

16. Type of livestock, Total and amount sold in the past 12 months

Type	Tick Type	Total amount of livestock	Number of livestock sold in the past 12 months	Existing market price in TShs per unit
Traditional Goats				
Dairy goats				
Traditional Cows				
Dairy Cows				
Pigs				
Chicken				
Sheep				
Donkey				
Others; Specify				

17. Name products you harvest from livestock and amount in the past 12 months.

Product	Total amount in units produced	Total amount of units sold	Unit price
Milk (litres per day)			
leather			
Beef			
Cooking oil			
Eggs (number of eggs per week)			
Others, Specify			

Inputs for crops and livestock in the past 12 months

18. Labour used for crops in man days (for three crops major)

Crop 1: Name.....

	family labour (man days)	Communa l labour (mandays)	Hired labour (man days)	How much did you pay in cash for hired labour	How much did you pay in kind for hired labour
Farm clearing and preparation					
Planting					
First weeding and application of agrochemicals					
Major weeding					
First Harvest					
Storage of crop					
Transportation of crop					
First selling					
Other activities, name					

Crop 2: Name.....

	family labour (man days)	Communa l labour (mandays)	Hired labour (man days)	How much did you pay in cash for hired labour	How much did you pay in kind for hired labour
Farm clearing and preparation					
Planting					
First weeding and application of agrochemicals					
Major weeding					
First Harvest					
Storage of crop					
Transportation of crop					
First selling					
Other activities, name					

	family labour (man days)	Communa l labour (mandays)	Hired labour (man days)	How much did you pay in cash for hired labour	How much did you pay in kind for hired labour
Farm clearing and preparation					
Planting					
First weeding and application of agrochemicals					
Major weeding					
First Harvest					
Storage of crop					
Transportation of crop					
First selling					
Other activities, name					

Crop 3 Name.....

19. Other farm inputs and other services

Type of input	Amount in units purchased	Unit price	Total Cost
Seeds			
Fertilizers			
Pesticides			
Manure			
Hand Hoe			
Oxen plough			
Tractor			
Others; Specify			

20. Labour used for livestock in the past 12 months

	family labour (man days)	Communal labour(mand ays)	Hired labour (man days)	How much did you pay in cash for hired labour	How much did you pay in kind for hired labour
Feeding (e.g trekking, grazing etc					
Milking					
Cleaning					
Other services					

21. Livestock inputs and other services used in the past 12 months

Type of input	Amount in units	Unit price	Total Cost
Animal feed			
Veterinary services			
Other services			

22. Average amount of income received from on the farm activities per year .....
23. Average amount of off farm income activities received per year.....

24. Do you receive any financial assistance from children/relatives/friends outside the village *Remittances* in the past 12 months

	1= Yes	2=No remittance/financial assistance	If yes amount received
Children			
Relatives			
Friends			
neighbours			

C: Shocks

25. Have you experienced any of these shocks in the past 12 months

	1= Yes	2=No
Floods		
Death of a close relative		
Sickness of a member of the household		
Drought		
Fire		
Death of livestock due to disease		
Crops been attacked by pests		
Crops been attacked by wild animals		

D. Credit

D.1 Demand for credit

28. Do you need credit

1=yes		2=no	

29. If yes in 28 give reasons

Consumption		On farm		Off Farm	
Purchasing food		Purchasing farming inputs		Rehabilitating house	
Paying school fees		Purchasing livestock inputs		Building house	
Purchasing school uniform		Purchasing tree seedlings		Building a livestock burn	
Funerals		Purchasing livestock		Installing electricity	
Wedding		Coop with risks		Installing solar energy	
Other traditional ceremonies					
Purchasing food crops					

D.2 Access to credit

30. Respond to the following statements

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
	(5)	(4)	(3)	(2)	(1)
Sources of credit are not available					
Do not know a place to borrow					
Credit application process takes a long time					
The maximum amount of credit offered is a limit					
It is difficult to meet the conditions of getting credit					
Distance is a limitation to source of credit					
Interest rate on credit is high					
Collateral is a limiting factor to getting credit					
Credit application will be rejected					
The amount requested for is not the amount of credit you can get					
Do not take credit because credit approval process takes a long time					
The credit term offered discourages access to credit					

D.3 Attitude towards credit

31. Respond to the following statements?

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
	(5)	(4)	(3)	(2)	(1)
It is impossible to get credit					
Do not like credit					
Do not take credit because it will make me poor					
Do not take credit because the community will judge me as poor					
There is favouritism in issuing credit					
Do not take credit because it will not make any changes in my livelihood					
Credit is for the rich					
Credit is risky					
Religious belief prohibit credit					
Credit is for men only					
Staff members are not friendly and encouraging					
Staff members and leaders reveal the amount of credit that an individual has been availed					
Leaders/board members are not friendly and encouraging					
Do not take credit because of the poor performance of RFM in the past.					

D.4 Knowledge index

32. Respond to the following questions. To what extent do you have knowledge of the following?

	To a great extent	Some what	Little	Very Little	Not at all
Meaning of credit					
The by-laws of rural financial markets/ formal or informal					
The procedures of getting credit					
The conditions that are required for you to get credit					
The criteria of forming a peer group					
A credit application form					
How to fill a credit application form					
That there is a credit committee					
The functions of a credit committee					
Membership of the credit committee					
The types of credit offered					
The interest rate on credit					
The maximum amount of credit offered					
The collateral required					
The guarantors required					
How long it takes to get credit					
The mode of repayment					
The penalties set on failure to repay					
The repayment period of credit offered					

33. Have you ever attempted to apply for credit
1= yes 2 = no

34. If yes above when did you first apply for credit. Specify year

Formal	Semi formal	Informal

35. If yes above how many times have you attempted

Formal		Semi formal		Informal	
Once		Once		Once	
Twice		Twice		Twice	
Thrice		Thrice		Thrice	
More than four times		More than four times		More than four times	

36. If you applied for credit when did you first get credit. Specify year.

Formal	Semi formal	Informal

37. How many times have you taken credit since you started

Formal		Semi formal		Informal	
Once		Once		Once	
Twice		Twice		Twice	
Thrice		Thrice		Thrice	
More than four times		More than four times		More than four times	

38. How many times have your credit application been rejected

Formal		Semi formal		Informal	
Once		Once		Once	
Twice		Twice		Twice	
Thrice		Thrice		Thrice	
More than four times		More than four times		More than four times	

39. If you get credit what are your sources of credit

Informal		Semiformal		Formal	
Children		Village Community Bank		NMB	
Spouse		SACCOS		KCB	
Friends within the village		SACA		CRDB	
Neighbour		Financial NGO		MCB	
Relative				Local Government	
Friends from other villages				Others: Mention	
Informal Group: Mention					

40. You are taking credit because of

1 = being a member	
2 = having an account	
3 = distance	
4= approach of the financial market	
5= interest on the rural financial market	
6= confidence on the rural financial market	
7= others: mention	

41. For what **purpose** do you request credit

Household Consumption	Off farm	On Farm
Purchasing food	For installing electricity	Purchasing seeds
For school fees of children	For installing water	Purchasing fertilizer
For medical purpose	Building house	Purchasing agro chemicals
Purchase of food crops	Constructing a livestock barn	Purchasing livestock medicine
Wedding	Starting a small business	purchasing livestock
Any other social event like confirmation, communion etc	Operating a small business	Preparing the farm
Traditional rituals	Preparing a tree nursery	Planting
Purchasing of school uniform for children	Purchasing of solar energy	Weeding
Purchasing of clothes for members of the household	Purchase of a sewing machine	Paying for farm labour
Purchase of a Television	Purchase of carpentry tools	Purchasing coffee seedlings
Purchase of utensils	Purchase of timber cutting tools	Purchasing agriculture machines

D.5 Information Source

42. If yes how did you first get information on credit source

1 = attending meetings
2 = campaigns on RFM
3 = training offered by RFM/NGO/Government
4 = information from friend
5 = information from neighbours
6 = information from children
7 = information from relatives
8 = participating in rural financial markets
9 = information from radio
10=information from village/ward/division notice boards
11=Information from religious gatherings

D.6 Amount of credit, Interest rate and Duration

43. Amount of credit and interest rate and the maximum duration of credit received

Where do usually get credit	Amount requested		Amount received		Interest rate		Credit duration offered in months
	In kind Units	in cash	In cash	In kind	In kind	in cash	
Informal							
Children							
Spouse							
Friends within the village							
Neighbour							
Relative							
Friends from other villages							
Shop							
Money Lender							
Informal GroupMention							
Semiformal							
Village Community Bank							
SACCOS							
SACA							
Financial NGO							
Formal							
NMB							
CRDB							
KCB							
MCB							
OthersMention							

D7 Conditions for credit

44. Is a collateral required for getting credit

1= yes	2=No

45. If yes what is the type/amount of collateral is required

Source	Type of collateral (see below table)	Collateral amount/type	
		In kind/mention and specify	in cash
Informal			
Children			
Spouse			
Friends within the village			
Neighbour			
Relative			
Friends from other villages			
Shop			
Money Lender			
Informal GroupMention			
Semiformal			
Village Community Bank			
SACCOS			
SACA			
Financial NGO			
Formal			
NMB			
CRDB			
KCB			
MCB			
Others Mention			

Key for type of collateral: 1= in kind; 2 = cash; 3 = both cash and in kind; 4=group; 5=both group and cash

46. Are you able to offer the collateral required by the RFM.

1= Yes		2=No	

47. If not able to offer collateral required give reasons

1= don't understand reason for having a collateral	
2= Do not have the collateral	
3= Difficult to obtain	
4= Afraid to offer collateral because my physical properties will be sold	
4= Others , specify	

48. Is a guarantor required

Source	1=yes	2=No	If yes. What are the number of guarantors
Informal			
Children			
Spouse			
Friends within the village			
Neighbour			
Relative			
Friends from other villages			
Shop			
Money Lender			
Informal Group Mention			
Semiformal			
Village Community Bank			
SACCOS			
SACA			
Financial NGO			
Others; mention			
Formal			
NMB			
CRDB			
KCB			
MCB			
Others Mention			

49. Are you able to get all the guarantors required.

1= Yes		**2=No**	

50. If it is difficult to get guarantors give reasons

1= Amount of credit requested	
2= People do not trust me	
3= People are afraid of being guarantors	
4= Others, specify	

51. Are they any other conditions for receiving credit

	1= Yes	**2=No**
Formal		
Semi-formal		
Informal		

52. If yes what are the conditions required for receiving credit

	1=yes 2=No	Formal	Semi -Formal	Informal
		Amount/ number	Amount/ number	Amount/ number
1= Membership				
2= Membership fee				
3= Shares				
4= Savings				
5= demand deposits				
6= attend training				
7 = attendance to meetings				
8= approval of group members				
9=Others; mention				

D.7.1 Application fees

53. Did you pay any other expenses related to credit application

	1= Yes	2=No
Formal		
Informal		
Semi-formal		

54. If yes give details of each item and how much you paid

Item	Amount paid in TShs.
Application form fee	
Loan Application fee	
Loan Assessment fee	
Others; mention	

D.8 Distance to Source of Credit

55. Distance to RFM in Kms

	Distance in Kms.
Formal	
Informal	
Semi-formal	

56. Accessibility by road to Rural financial market you are getting services from

	1=seasonal	2= Throughout the year	3= Not accessible
Formal			
Semi-formal			
Informal			

57. Which means of transport do you frequently use

Formal

		Expenses incurred	Time Taken in minutes	Number of days to and fro until you get credit
1=Bus				
2=Walk				
3=Bicycle				
4=Others				

Semi-formal

		Expenses incurred	Time Taken in minutes	Number of days to and fro until you get credit
1=Bus				
2=Walk				
3=Bicycle				
4=Others				

Informal

		Expenses incurred	Time Taken in minutes	Number of days to and fro until you get credit
1=Bus				
2=Walk				
3=Bicycle				
4=Others				

D.9 Length of getting credit

58. How long did you take to receive credit.

	Informal Formal		Semi-Formal		Formal	
	Minutes per day	Days	Minutes per day	Days	Minutes per day	Days
Length of processing application *form*						
Length of waiting for credit after approval						
Length of getting the money since application is approved						

D.10 Repayment

59. Have you been able to repay the credit you received in the past 12 months

	1= Yes	2=partially	3=No
Formal			
Informal			
Semi-formal			

60. If partially or no what is the amount overdue

	Amount overdue in TShs	
	Cash	Inkind
Formal		
Informal		
Semi-formal		

61. Were you given any penalties for overdue credit

	1= Yes	2=No	If yes specify amount	
			Cash	Inkind
Formal				
Informal				
Semi-formal				

62. If no give reasons of failing to repay credit

.....

.....

D.10 Delivery methodology

63. Are you satisfied with the process of delivering credit

	1= Yes	2=No
Formal		
Informal		
Semi-formal		

64. What are your general opinions/recommendations on the process of delivery credit

.....

.....

65. What are your opinions on the relationship you have with leaders/board members/staff of rural financial market

.....

.....

66. What are your opinions on the relationship you have with staff of rural financial market

.....

.....

67. What are your opinions on services offered by the different types of financial markets

.....

.....

.....

E. Deposits

E.1 Savings

68. Have any savings at home,

1= Yes		2=No saving	

69. If yes, What form of savings and amount

Form of savings		**Amount saved/numbers/cash**
Livestock Mention.....		
Crops Mention.....		
Cash		
Trees		
Others Mention		

70. Are you depositing savings in rural financial markets

	1= Yes		2=No	
Informal Group Mention				
SACCOS				
SACA				
Others Mention				

71. If yes what amount have you deposited upto now

		Amount
1=Savings		
2=Demand deposits		
3=Shares		
4=Others, specify		

72. Are you aware of the interest rate offered on savings

1= Yes		2=Not aware of interest rate on savings	

73. If yes what is the interest rate on savings.....

F . Social Capital

F.1 Trust

74. Do you agree or disagree with the following statements?

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
	(5)	(4)	(3)	(2)	(1)
Most people who live in this village can be trusted					
Most people who live in the neighbourhood villages can be trusted					
In this village people generally do not trust each other in matters of lending and borrowing money					
You have to be careful when dealing with people in this village					
You have to be careful with people from neighbouring villages					

75. To what extent do you trust different groups of people.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
	(5)	(4)	(3)	(2)	(1)
Do not Trust family members					
Do not Trust People from same ethnic group					
Do not Trust people from other ethnic group					
Do not Trust people in the same rural financial market					
Do not Trust Shopkeepers					
Do not Trust Ward and village officials					
Do not Trust Police					
Do not Trust Teachers					
Do not Trust Nurses and doctors					
Do not Trust Staff of rural financial market					
Do not Trust people who belong to the same religion/dominion					
Do not Trust village committees					

76. To what extent do you trust leaders/leadership approaches.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
	(5)	4)	(3)	(2)	(1)
Do not trust Community official leaders i.e VEO					
Do not Trust Leadership approaches used by appointed/official leaders					
Do not Trust traditional/clan leaders					
Do not Trust Leadership approaches used by community leaders					
Do not Trust Leaders of rural financial market					
Do not Trust Leadership approaches used by leaders of rural financial markets					
Do not Trust Leaders of religious groups					
Do not Trust Leadership approaches used by religious leaders					
Do not Trust Leaders of informal groups					
Do not Trust Leadership approaches used by informal groups					
Do not Trust councillors					
Do not Trust Leadership approaches used by councillors					

F.2 Information

78. How frequent do you

	1= Very Frequently	2= Occasionally	3=Rarely	4= Very rarely	5= never
Attend village meetings					
Attend clan meetings					
Attend meetings of semiformal rural financial market					
Attend meetings of informal rural financial market					
Listen to the radio					
Watch Television					
Go to the market					
Attend places of worship					
Read newspapers					
Get information by telephone					
Attend Political Campaigns/meetings					

79. Do you participate in exchanging information on credit in Rural Financial Market

	Yes	No
1=Not participate at all		
2=Receive information only		
3=Provide information only		
4=Both receive and provide		

F.3 Networks/relations

F.3.1 Individual level

80. If you urgently needed some amount of money to meet emergency issues at your household how many people beyond your immediate household could you turn to who would be willing to provide you with money?

	1 =No one 2 =One to two people 3 =Three to four people 4 =Five or more people
Within the village	
Outside the village	

F.3.2 Rural Financial Market Level

81. If you urgently needed some amount of money to meet emergency issues at your household which rural financial market could you turn to who would be willing to provide you with money?

Informal		Semiformal		Formal	
Children		Village Community Bank		NMB	
Spouse		SACCOS		KCB	
Friends within the village		SACA		CRDB	
Neighbour		Financial NGO		MCB	
Relative				Local Government	
Friends from other villages				Others: Mention	
Informal Group Mention					

82. Are you involved in dealing with advising on/solving community/other households' problems

1= Yes		2=No	

83. Reasons of involvement in dealing with/solving problems at community or other households

1=official duty
2=self initiative
3=requested by the community
4=political leader
5=clan leader
6=group leader.

F.4 Associations

84. Tick the type of organization/s you are a member of and the participation of the household

Type of Organization	Tick organisation that you belong to	Member of the household who participates 1= Husband 2=Wife 3=Son 4=Daughter	How actively does The household member participate in the group activities. 1 = Leader 2 = Member of a committee 3 = Member 4 = Very Active participant 5 = Somewhat active 6 = Not very active
Education school committee			
Water Users group			
Agricultural marketing cooperative society			
Savings and credit cooperative society			
Financial Non governmental organization			
Producer group			
Political group			
Religious group			
Women group			
Burial group			
Informal Credit and savings groups			
Ward Committee			
Village committee			
Ngoma groups			
Community groups			
Youth group			
Farmers field school			
Burial group			
Others; Mention			

Appendix 2: Questionnaire on rural small scale farmers' access to credit for village leaders

QUESTIONNAIRE FOR VILLAGE LEADER.

Name of Village :.....
District :.....

1. Village population :.....

   Size of land.....

2. Major activities in the village
   .....
   .....
3. Activities in the village that use credit
4. Value of land per acre.....
5. Name formal and informal groups in the village and details of each.
   .....
   .....

6. Mention and give details on Credit sources used by people in the village both formal and informal
   .....
   .....

7. What are the views on access to credit regarding the existing rural financial markets both formal and informal
   .....
   .....

Appendix 3: Nonparametric Correlations

Spearmans Rho

	Sex of head of household	Age of head of household	Years of schooling of head of household	wealth index	Trust leader index	Disposable income	social capital index	Total networks	Membership index	Total household savings	Total rural financial market savings	Knowledge Index	Attitude Index	Total Land	Borrowers transaction costs semiformal	Borrowers transaction costs semiformal	Borrowers transaction costs semiformal	Number of Children Out of village	Thrust group index	Trust leader index	Information index	Household size
Sex of head of household	1.000																					
Age of head of household	0.106	1.000																				
Years of schooling of head of household	0.173**	-0.372**	1.000																			
Wealth index	0.142***	-0.022	0.357***	1.000																		
Trust leader index	-0.035	-0.010	0.083	0.071	1.000																	
Disposable income	0.162**	0.099	0.128***	0.367**	0.096	1.000																
Social capital index	0108	0150***	0.224**	0.195**	0.373**	0.008	1.000															
Total networks	0.047	0.119	0.106	0 068	0.163**	0.057	0.876**	1.000														
Membership index	0.136**	0165**	0.318**	0.386**	0.234**	0.243 **	0.635**	0.305 **	1.000													
Total household savings	0.307**	-0.016	0.385***	0.522**	0.167**	0.454 **	0.347**	0.179 **	0.462 **	1.000												
Total rural financial market savings	0.076	0.005	0.371**	0.455**	0163**	0.196 **	0.413**	0.270 **	0.568 **	0.499**	1.000											
Knowledge Index	-0.027	0.029	-0.380**	-0.360**	-0.277**	- 0.228 **	-0.399**	- 0.246 **	- 0.495 **	-0.444**	- 0.596 **	1.000										
Attitude Index	0.026	-0.009	0.281**	0.377**	0.296**	0.257 **	0.354**	0.206 **	0.464 **	0.421**	0.446 **	-0.612**	1.000									
Total Land	0.162**	-0.003	0.019	0.303**	0.020	0.412 **	-0.135***	- 0.203 **	0.004	0.373**	-0.053	-.0010	0.075	1.000								
Borrowers transaction costs semiformal	-0.005	-0.095	0.350**	0.310**	0.146***	0.224 **	0.178**	0.042	0.315 **	0.316**	0.438 **	-0.487**	0.363 **	0.203**	1.000							
Borrowers transaction costs semiformal	0.004	0.147***	0.152***	0 074	0.133***	-0.085	0.345**	0.294 **	0.316 **	0.164**	0.249 **	-0.296**	0.170 **	0.203**	-0.041	1.000						
Borrowers transaction costs semiformal	0.088	-0.072	0.136**	0.141***	0.184**	0.112	0.103	0.058	0.101	0.176**	0.192 **	-0.142***	0.139 ***	0.145***	0.056	-0.007	1.000					
Number of Children Out of village	0.101	0.571	-0.027	0.098	-0.084	0.176 ***	0.058	0.124	0.002	0.021	0.147	0.097	0.010	0.011	-0.042	-0.100	0.084	1.000				
Thrust group index	0.004	0.015	0.101	0.013	0.755**	0.069	0.320**	0.130 ***	0.143 *	0.101	0.053	-0.218**	0.238 **	0.009	0.093	0.150**	0.097	-0.108	1.000			
Trust leader index	-0.035	-0.010	0.083	0.071	0.960**	0.096	0.373**	0.163 **	0.234 **	0.167**	0.163 **	-0.277	0.296 **	0.020	0.146 **	0.133***	0.184**	-0.084	0.755***	1.000		
Information index	0.161**	-0.019	0.365***	0.313**	0.427**	0.305 **	0.443**	0.260 **	0.468 **	0.374**	0.419 *	-0.509**	0.408 **	0.039	0.298 **	0.182**	0.177**	0.040	0.424**	0.427 **	1.000	
Household size	0.231**	0.570**	-0.139***	-0.129	0 064	0.063	0.242**	0.214 **	0.169 **	0.049	-0.025	-0.013	-0.044	-0.012	-0 109	0 052	-0 022	0.408 **	0 075	0 064	0 099	1.000
Borrowers Transaction Cost	0.051	-.0018	0.351**	0.173**	0.229**	0.084	0.310**	.180* *	.398* *	.312**	.460* *	-0.560**	0.353 **	-0 007	0.602 **	0.646**	0 181**	-0 117	0 198**	0.229 **	0.364 **	- 011

***Correlation is significant at the 0.01 level (2-tailed).

**Correlation is significant at the 0.05 level (2-tailed).

Appendix 3: Nonparametric Correlations

Spearmans Rho

	Sex of head of household	Age of head of household	Years of schooling of head of household	wealth index	Trust leader index	Disosable income	social capital index	Total networks	Membership index	Total household savings	Total rural financial market savings	Knowledge Index	Attitude Index	Total Land	Borrowers transaction costs semiformal	Borrowers transaction costs semiformal	Borrowers transaction costs semiformal	Number of Children Out of village	Thrust group index	Trust leader index	Information index	Household size
Sex of head of household	1.000																					
Age of head of household	0.106	1.000																				
Years of schooling of head of household	0.173**	-0.372**	1.000																			
Wealth index	0.142***	-0.022	0.357***	1.000																		
Trust leader index	-0.035	-0.010	0.083	0.071	1.000																	
Disosable income	0.162**	0.099	0.128***	0.367**	0.096	1.000																
Social capital index	0108	0150***	0.224**	0.195**	0.373**	0.008	1.000															
Total networks	0.047	0.119	0.106	0.068	0.163**	0.057	0.876**	1.000														
Membership index	0.136**	0165**	0.318**	0.386**	0.234**	0.243**	0.635**	0.305**	1.000													
Total household savings	0.307**	-0.016	0.385***	0.522**	0.167**	0.454**	0.347**	0.179**	0.462**	1.000												
Total rural financial market savings	0.076	0.005	0.371**	0.455**	0163**	0.196**	0.413**	0.270**	0.568**	0.499**	1.000											
Knowledge Index	-0.027	0.029	-0.380**	-0.360**	-0.277**	-0.228**	-0.399**	-0.246**	-0.495**	-0.444**	-0.596**	1.000										
Attitude Index	0.026	-0.009	0.281**	0.377**	0.296**	0.257**	0.354**	0.206**	0.464**	0.421**	0.446**	-0.612**	1.000									
Total Land	0.162**	-0.003	0.019	0.303**	0.020	0.412**	-0.135***	-0.203**	0.004	0.373**	-0.053	-.0010	0.075	1.000								
Borrowers transaction costs semiformal	-0.005	-0.095	0.350**	0.310**	0.146***	0.224**	0.178**	0.042	0.315**	0.316**	0.438**	-0.487**	0.363**	0.203**	1.000							
Borrowers transaction costs semiformal	0.004	0.147***	0.152***	0.074	0.133***	-0.085	0.345**	0.294**	0.316**	0.164**	0.249**	-0.296**	0.170**	0.203**	-0.041	1.000						
Borrowers transaction costs semiformal	0.088	-0.072	0.136**	0.141***	0.184**	0.112	0.103	0.058	0.101	0.176**	0.192**	-0.142***	0.139***	0.145***	0.056	-0.007	1.000					
Number of Children Out of village	0.101	0.571	-0.027	0.098	-0.084	0.176***	0.058	0.124	0.002	0.021	0.147	0.097	0.010	0.011	-0.042	-0.100	0.084	1.000				
Thrust group index	0.004	0.015	0.101	0.013	0.755**	0.069	0.320**	0.130***	0.143*	0.101	0.053	-0.218**	0.238**	0.009	0.093	0.150**	0.097	-0.108	1.000			
Trust leader index	-0.035	-0.010	0.083	0.071	0.960**	0.096	0.373**	0.163**	0.234**	0.167**	0.163**	-0.277	0.296**	0.020	0.146**	0.133***	0.184**	-0.084	0.755***	1.000		
Information index	0.161**	-0.019	0.365***	0.313**	0.427**	0.305**	0.443**	0.260**	0.468**	0.374**	0.419*	-0.509**	0.408**	0.039	0.298**	0.182**	0.177**	0.040	0.424**	0.427**	1.000	
Household size	0.231**	0.570**	-0.139***	-0.129	0.064	0.063	0.242**	0.214**	0.169**	0.049	-0.025	-0.013	-0.044	-0.012	-0.109	0.052	-0.022	0.408**	0.075	0.064	0.099	1.000
Borrowers Transaction Cost	0.051	-.0018	0.351**	0.173**	0.229**	0.084	0.310**	.180*	.398*	.312**	.460*	-0.560**	0.353**	-0.007	0.602**	0.446**	0.181**	-0.117	0.198**	0.229**	0.364**	-.011

***Correlation is significant at the 0.01 level (2-tailed).

**Correlation is significant at the 0.05 level (2-tailed).