DETERMINANTS OF AGRICULTURAL CREDIT ACQUISITION FROM THE LAND BANK OF SOUTH AFRICA: A CASE STUDY OF SMALLHOLDER FARMERS IN PERI-URBAN AREAS OF MOPANI DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA

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ABSTRACT

Capital is one of the most important factors of production. In South Africa, among other things, lack of finance is one of the fundamental problems hampering production, productivity and income of rural farm households. Smallholder farmers in South Africa face many challenges in accessing financial services, despite the numerous reforms undertaken by the government to transform smallholder agriculture and improve its contribution to rural income, food security and employment. Many rural farmers have remained in poverty with limited capacity to access means of production like credit to militate against hunger and poverty.

The aim of the study was to analyse the determinants of loan acquisition from the Land Bank of South Africa by smallholder farmers in peri-urban areas of Mopani District in Limpopo province. The objectives were to identify the constraints smallholder farmers face in accessing credit, to analyse the determinants of loan acquisition among smallholder farmers and to profile loan acquisitions of the farmers based on their socio-economic characteristics.

The study used primary data, which was collected through a field survey. The method that was used to collect information was face-to-face interviews using structured questionnaires. The study employed the snowball sampling technique in its data collection strategy due to the fact that the population size was unknown due to the sensitivity of the study. Smallholder farmers were classified as beneficiaries and non-beneficiaries of the Land Bank. The total sample size comprised 62 smallholder farmers from the peri-urban areas of Tzaneen and Giyani of Mopani District, Limpopo province.

The data was captured into the Statistical Package for Social Sciences (SPSS). Principal component analysis was carried out so as to get the principal factors or new uncorrelated variables that affect the ability of smallholder farmers to access credit from the Land bank and it was also use to profile the farmers according to the socio-economic variables. After carrying out the principal component analysis, probit analysis was then used to determine the relationship between the socio-economic characteristics of smallholder farmers and their ability to access credit.

The principal component analysis (PCA) extracted important information from the data table and expressed the information as a set of new orthogonal variables called principal components. The PCA reduced the original variables to six (6) principal components. The six (6) principal components were labelled as; component 1 (Old-experience smallholder farmers), component 2 (business-oriented smallholder farmers), component 3 (part-time smallholder farmers), component 4 (smallholder farmers who receive grants based on gender), component 5 (smallholder farmers with fixed assets and their distance to the nearest town) and component 6 (smallholder farmers who belong to cooperatives). The smallholder farmers where classified and ranked into this six components based on their level of accessibility to agricultural credit from the Land Bank. A majority of the smallholder farmers involved in the study were ranked lowly on their level of accessibility to agricultural credit from the Land Bank; they were classified under the old and experienced smallholder farmers.

Probit regression result indicated that the variables gender, education, farm income, pension, land size, cooperative, fixed assets and registered business had a significant positive influence on smallholder farmers' accessing agricultural credit from the Land Bank in the last three years. In addition, marital status, farming experience, off-farm income, loose assets, farm commodity and farm record had an insignificant positive influence.

The probit result also showed that the variables age had a significant negative influence on smallholder farmers' accessing agricultural credit. In addition, household size, employment, distance to the nearest town and farmers' association had an insignificant negative influence.

Based on the results of the study, it is recommended that the government and other institutions could design agricultural credit programmes that are promptly responsive to the needs of the smallholder farmers. It was also recommended that the Department of Agriculture, Forestry and Fisheries (DAFF) should ensure that the agricultural extension officers are well equipped to be able to disseminate their information to farmers irrespective of their location

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DEDICATION

This study is dedicated to my family who have been my pillar of strength

DECLARATION

I declare that DETERMINANTS OF AGRICULTURAL CREDIT ACQUISITION FROM THE LAND BANK OF SOUTH AFRICA: A CASE STUDY OF SMALLHOLDER FARMERS IN PERI-URBAN AREAS OF MOPANI DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA is my own work and that all sources that I have used or quoted have been indicated and acknowledges by means of complete references and this work has not been submitted for any other degree at any other institution

Signature: Date:

Braide Tamunotonye Mayowa[redacted]

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LIST OF ACRONYMS

AEAs	Agricultural Extension Agents
AFDB	African Development Bank
CASP	Comprehensive Agricultural Support Programme
CSDA	Centre for Social Development in Africa
CRDP	Comprehensive Rural Development Programme
DAFF	Department of Agriculture, Forestry and Fisheries
DBSA	Development Bank of Southern Africa
FBOs	Farmer Based Organisations
GDP	Gross Domestic Product
GLLM	Greater Leteba Local Municipality
GTM	Greater Tzaneen Municipality
HLPE	High Level Panel of Experts
ISRDS	Integrated Sustainable Rural Development Strategy
KMO	Kaiser-Meyer-Olkins Measure of Sampling Adequacy
Land Bank	The Land and Agricultural Bank of South Africa
LDA	Limpopo Department of Agriculture
LRDA	Land Redistribution for agricultural development
MAFISA	Micro Agricultural Finance Institution of South Africa
MoFA	Ministry of Food and Agriculture
NACRDB	Nigerian Agricultural, Cooperative and Rural Development Bank

NGO	Non – Government Organisation
NSPFS	National Special Programme for Food Security
OECD	Organisation for Economic Co-operation and Development
PCA	Principal Component Analysis
PTO	Permission to Occupy
SMME	Small, Micro and Medium Enterprises
STATS SA	Statistics South Africa
WIEGO	Women in Informal Employment Globalizing and Organising.

CHAPTER 1 INTRODUCTION

1.1 Background of the study

In South Africa, agriculture is an important part of the economy as it contributes to employment, food security, poverty alleviation and to the country's gross domestic product (GDP) (Quantec, 2013). When compared to other sectors, agriculture contributes 2.5% of the total GDP (World Bank, 2014). Despite a growing population and estimated to reach 95 million by 2050, South Africa needs to focus on strengthening food production and food security (Chisasa 2015). Despite its relative small share of the total GDP, the agricultural sector remains a significant provider of employment, especially in rural areas, thus reducing poverty (Mabuza, 2009). South Africa is naturally endowed with vast agricultural farm land and has geographical conditions that favour agricultural production throughout the year. The Limpopo Province is abundant in agricultural resources and is one of the country's prime agricultural regions noted for the production of livestock, fruits and vegetables, cereals and tea (LDA, 2008).

The agricultural sector in South Africa is characterised by dualism, where large scale commercial and smallholder sectors exists side by side. The commercial agricultural sector comprises of well-resourced and operated farms as well as advanced production technology. The smallholder farms are located mostly in the former homeland areas of South Africa. Farming under the smallholder system is characterised by low levels of production technology, lack of access to land, poor access to markets, poor access to inputs and most importantly poor access to finance or credit to access agricultural production loan (LDA, 2008).

Agriculture is a risky business because farmers do not only contend with the market risk but also with environmental factors such as weather. The physical performance of South African agriculture is heavily influenced by the climate (Kirsten, 2011). This puts agriculture at a disadvantage when competing with other sectors for scarce funds (Mudhara, 2010). A large number of smallholder farmers represent high risk to financial institutions as evidenced by their reluctance to lend the sector. The smallholder farmers cultivate small farm land, harvested low yields and remain poor.

Smallholder farmers in communal areas of South Africa have limited access to factors of production including credit and information (Sebopetji *et al.*, 2009). Credit plays a major role in the transformation of traditional agriculture into a modern large-scale commercial type which enhances agricultural development (AFDB, 2013). Credit is necessary for purchasing inputs needed for effective adoption of modern agricultural techniques. Many economists have identified the lack of basic assets as major constraint to agricultural development (Abayomi and Salami, 2008). They also stressed the suitability of terms of credit as a necessary condition for fostering agricultural development. It is a common argument that agricultural credit enhances productivity and promotes standard of living by breaking vicious cycle of poverty of smallholder farmers (Muhongayire, 2013). One of the most successful ways to reduce poverty in developing countries is to prioritize the agricultural sector and smallholder farmers, effectively emphasising rural initiatives that would promote productivity, marketing and international trading possibilities (Collymore, 2005; Bruck & Van den Broeck, 2006). This can be accomplished, not only through supporting smallholder farmers with input provision packages, research and extension services but also by improving access to credit.

Since 1994, land reform was implemented under three main components: restitution of land rights, land redistribution and tenure reform. However, these programmes have yet to make a significant impact on either the highly unequal distribution of land or the livelihood opportunities of the majority rural population (Thwala, 2003). Tenure reform is concerned with the protection, or strengthening of rights of residents of privately owned farms and state land, together with the reform of the system of communal tenure prevailing in the former homelands (Thwala, 2014). There are various forms of land tenure systems used in South Africa but in the former homelands the most common system of land tenure is the communal system as majority of the smallholder farmers in former home lands cannot afford to purchase or lease land. According to Jacobs *et al.* (2011), the Native Land Act of 1936 allowed a magistrate to allow rural occupants applying for land a “Permit to Occupy” (PTO) as proof that a piece of land had been granted to the holder of the document. A PTO conferred rights to occupy and use the land but the state still owned the land. Traditional Authorities (tribal and community leaders) issued PTOs to occupants on public land. The disadvantage of a PTO land is that it is not recognized by banks as

a form of collateral (Jacobs *et al.*, 2011). According to Thwala (2010), land tenure is legally insecure and uncertain, especially in the former homelands where almost a third of the national population live. Tenure reform has failed to address the chaotic system of land administration in the communal areas of the former homelands. This is probably the most neglected area of land reform, even though it has the potential to impact on more people than all the other land reform programs combined, especially the landless/poor.

1.2 Overview of Agricultural Credit Markets in South Africa

The South African government has, in recent years, been spending a huge amount of its budget on supporting the development of smallholder farming (Lefophane *et al.,* 2013). Nevertheless, various constraints still hinder smallholder farmers from reaching their potential. The constraints, for example lack of access to credit make it very difficult if not impossible for the smallholder farmers to participate successfully in commercial agricultural markets despite some of them having had improved access to agricultural land (DBSA, 2005). As such over the years the government has fostered the growth of credit supply to smallholder farmers, but with limited success.

Since the beginning of democratic rule in 1994, the smallholder farming sector in South Africa has grown slowly. Empirical evidence has attributed the slow growth to market failures such as lack of access to credit and market failures (Chisasa, 2015). Government established policy programmes geared towards the support and funding of smallholder farmers through a variety of funding agencies and institutions.

The Land and Agricultural Bank of South Africa (Land Bank) is a government-owned bank of South Africa, founded in 1912 by the then government of South Africa as a development finance institution. In the 1950's the Agricultural Credit Board (ACB) was established to give loans to farmers who were no longer found adequately credit worthy by commercial institutions (Ndlovu, 2013). Some of the parastatal credit institutions, for example Agricultural Development Banks of Ciskei and Transkei, Agribank of the North West Province, Gazankulu Development Finance Corporation, Lebowa Development Finance Corporation both in Limpopo Province, and Uvimba Finance Corporation in the Eastern Cape that were established in the former homelands have collapsed as a result of agricultural transformation in the country,

thus leaving smallholder farmers without access to credit (Lefophane *et al*., 2013). Hence, a gap in services was created by the demise of the former homeland parastatals and the Land Bank which is South Africa's primary formal agricultural credit institution was expected to fill the gap (Machete, 2004). However, a study by Machethe (2004) indicated that the Land Bank was not able to deliver its services to the majority of the smallholder farmers, therefore leaving majority of the smallholder farmers without access to agricultural credit.Farmers who lack collateral in terms of land and other assets normally access credit through informal lenders who charge higher interest rates than formal lenders, thus,resulting in lower profits to borrowers. Chisasa and Makina (2012) demonstrated that credit to smallholder farmers lagged to that of commercial farmers and private sector in trend analysis of credit supply spanning the period 1970 to 2009. Empirical evidence suggested that smallholder farmers in South Africa have performed badly due to lack of access to formal sources of credit (Lahiff and Cousins, 2005). While these studies agree that smallholder farmers are credit constrained, there is limited information on the factors that influences the ability of farmers to access formal agricultural credit in the new South Africa. This study will be addressing the determinants of credit acquisition from the formal source of credit (Land Bank) by smallholder farmers.

1.3 Problem statement

In South Africa, the quest for sustainable and productive smallholder farming is borne out of the need to bring the previously disadvantaged farming entrepreneurs into the mainstream agricultural economy (Mmbengwa, 2010). Smallholder farmers in South Africa face various challenges that impede their growth and ability to effectively contribute to the economy relative to the commercial farmers. Some of the constraints they face relate to lack of access to land, lack of access to credit, poor physical and institutional infrastructure (DAFF, 2012). Credit is regarded as one of the essential factors of agricultural production. This is because the adoption of most farm technologies involves the purchase of improved inputs by the farmers (Umoren *et al.*, 2014). According to Chisasa (2014), itwas estimated that the majority of the rural population most of whom rely on agriculture for their livelihood, still did not have access to formal credit. Consequently, their full potential has not been realized due to lack of access to credit required for the purchase of farm inputs and capital equipment.

Financial institutions find it difficult to provide loans for the smallholder farmers due to various reasons that include lack of collateral, high transaction cost and poor repayment rates. Consequently, this brings about a huge gap in the productivity of the smallholder farmers compared to the well-resourced large scale farmers (Mudhara, 2010). Without land as collateral, smallholder farmers in South Africa find it difficult to access agricultural credit from formal agricultural credit institutions (Tshuma, 2014). Land is an important and sensitive issue to all South Africans. Land, its ownership and uses has always played an important role in shaping the political, economic and social processes at work in South Africa.

The Land Bank is the only primary development agricultural financial institution working in agricultural and rural development which means it has a very important role to play in the supply of financial services to the rural poor (Machethe, 2005). According to Chisasa and Makina (2012), the Land Bank has succeeded in reaching the needs of smallholder farmers but the majority of the smallholder farmers still do not have access to credit from the Land bank. Access to credit by smallholder farmers remains a major problem affecting their production capacity and level.

There have been previous studies that considered agricultural credit in South Africa in general such as a study carried out by Sebopetji and Belete (2009) in Greater Letaba Local Municipality (GLLM) of South Africa on the factors affecting small-scale farmers' decision to take credit as well as a study carried out by Lefophane *et al.* (2013) on investigated the technical efficiency in input use by credit and non-credit user emerging farmers in Maruleng Municipality of Limpopo province just to name a few. There have also been a few that focused on the Land Bank as an agricultural credit institution for smallholder farmers. One of the few studies that focused on the Land Bank was done by Mmbengwa *et al.,* (2010) on the factors that influence the success and failure of Land bank supported farming small, micro and medium enterprises (SMMES) in South Africa.

A common finding from past studies on the accessibility to credit is that the smallholder farmers in South Africa are credit constrained. In essence, this study attempts to investigate the factors that determine the smallholder farmers' access to agricultural credit from the Land Bank and also rank the loan acquisition of smallholder farmers based on their socio-economic characteristics.

1.4 Motivation of the study

In South Africa, smallholder farmers are unable to access credit to the same extent as commercial farmers, which has led to poor performance in food production. According to Chauke *et al*. (2013), the South African government, both during and immediately after independence, focused on financially assisting smallholder farmers that are widespread in the rural landscape .Due to lack of investment and proper management, these institutions have collapsed or merged with other organisations. Appropriate agricultural credit policy interventions need to take into account the socio-economic characteristics of the target group or individuals. An understanding of socio-economic characteristics and factors influencing the smallholder farmers to access formal agricultural credit will enable policy makers to adjust current credit policies to meet the needs of the smallholder farmers.

The rationale for the study was derived from the need to determine the factors that influence the access of smallholder farmers to agricultural credit as well as the socio-economic characteristics of smallholder farmers in the study area. Knowledge of the socio-economic characteristics of the farmers in the study area and factors that determine loan acquisition from the Land Bank of South Africa by smallholder farmers would aid policymakers to formulate policies aimed at addressing the lack of credit to smallholder agricultural sector.

1.5 Purpose of the study

1.5.1 Aim

The aim of this study is to analyse the determinants of loan acquisition from the Land Bank of South Africa by smallholder farmers.

1.5.2 Specific objectives

The specific objectives are to:

i. Identify the constraints that smallholder farmers face in accessing loans from the Land Bank of South Africa.

ii. Analyse the determinants of loan acquisition among smallholder farmers from the Land Bankof South Africa.

iii. Profile loan acquisition of smallholder farmers based on socio-economic characteristics.

iv. Suggest recommendations to improve the loan decision making process for the smallholder agricultural sector.

1.6 Research questions

i. What are the constraints smallholder farmers' faces in accessing agricultural loans from the Land Bank of South Africa?

ii. What determines the loan acquisition for smallholder farmers from the Land Bank of South Africa?

iii. How do the socio-economic characteristics of the smallholder farmer affect the loan acquisition process?

1.7 Scope of the study

The study is aimed at analysing the determinants of loan acquisition from the Land Bank of South Africa by smallholder farmers. The scope of this study is only limited to smallholder farmers who are beneficiaries and non-beneficiaries of the Land bank in peri-urban areas of Giyani and Tzaneen.

1.8 Organisation of the thesis

The study is organised into six chapters. Chapter one constitutes the introduction which outlines the background of the study, an overview of the agricultural credit market in South Africa, problem statement, aim and objectives guiding the study, research questions and motivation for undertaking the study. An empirical and theoretical review of issues related to the study is presented in chapter two. Chapter three presents the research methodology employed in the study, which includes a brief description of the study area, data collection method and analytical techniques used in the data. Chapter four provides a report on descriptive results and a discussion thereof. Chapter five presents empirical results of the study. The summary and conclusion of the major empirical findings and policy recommendations together with recommendations for future research are presented in chapter six.

CHAPTER 2: LITERATURE REVIEW

2.1 Definition of concepts

2.1.1 Smallholder farmers

Smallholder farmers are also defined as farmers most of who reside in the former homelands, owning small plots of land on which they grow subsistence crops and one or two cash crops relying almost exclusively on family labour (DAFF, 2012). Smallholder farmers differ in individual characteristics, farm size, resource distribution between food and cash crops, livestock and off-farm activities, their use of external inputs and hired labour, the proportion of food crops sold and household expenditure patterns.

2.1.2 Collateral

Collateral can be defined as the land, equipment, houses, cars and other things of value that a lender can hold as security for a loan and repossesses if the loan is not repaid (RAFI-USA, 2006). Land is the most accepted assets for use of loan collateral. Smallholder farmers rarely possess land titles which can be used as loan collateral by banks.

2.1.3 Land bank

Land Bank is a specialist agricultural bank guided by a government mandate to provide financial services to the commercial farming sector and to agri-business and to make available new, appropriately designed financial products that would facilitate access to finance by new entrants to agriculture from historically disadvantaged background (Land Bank, 2011).

2.1.4 Land tenure

Land tenure is the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land and they define how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints (FAO, 2002).

2.1.5 Permission to Occupy (PTO)

This is a user right of a personal nature allowing the user either use or occupation rights over a certain rural unsurveyed piece of land. A PTO is a less formal tenure right that merely evidences a user right and as such is only a personal right (Ghost Digest, 2012). Therefore it cannot be registered as a Deeds Registry, although it can be registered in several state departments, e.g. Agriculture, Local Government and Traditional affairs, etc. Most PTO's are for occupation where as a good few others are issued in respect to Land use, e.g. irrigation rights, etc.

2.2 Smallholder farm sector in South Africa

In South Africa, smallholder agriculture is practiced in a wide range of locations such as remote rural areas of the former homelands, in townships and cities. Smallholder farmers produce mainly staple foods for household consumption while few products make it to the local market (Lahiff *et al.*, 2005). Smallholder farming is highly differentiated by race, class, gender, with large numbers of very poor black women producing purely for household consumption and a small 'elite', mainly men, producing on a much greater scale (Lahiff *et al.*, 2005). Smallholder farmers are usually considered to be part of the informal economy, that is, they may not be registered, lack social protection and have limited records.

Labour is a key feature of smallholder agriculture. Smallholder agriculture relies mainly on family labour with limited reliance on hired labour. Smallholder farmers are generally lesser resourced than the commercial farmers, the resource base comprises of assets or capital (human, natural, social, physical and financial) and the resource base of smallholder agriculture is said to be 'small'. It is often barely able to sustain an acceptable livelihood (HLPE, 2013).

Smallholder farming plays an important role in livelihoods creation amongst the rural poor. The expansion of smallholder farming can lead to a faster rate of poverty alleviation, by raising the incomes of rural cultivators and reducing food expenditure, and thus reduces income inequality (Anríquez*et al.*, 2007 and World Bank, 2008).Despite smallholder production being important for household food security, the productivity of this sub-sector is low (DAFF, 2012).There is therefore a need to significantly increase the productivity of smallholder farmers to ensure long term food

security. This can be achieved by among others encouraging smallholder farmers to pursue sustainable intensification of production through improved inputs.

Smallholder farmers in South Africa face various challenges that impede their growth and ability to effectively perform the pivotal role in contributing to the development of the country. Some of the constraints they face relate to lack of access to land, lack of access to credit, poor physical and institutional infrastructure (DAFF, 2012). The lack of assets, information and access to services hinder smallholder farmers' participation in potentially lucrative markets. Smallholder farmers typically receive little technical support and often have low productivity due to an inability to invest in things such as improved seeds and soil replenishment (WIEGO, 2014). Smallholder farmers require a range of support services both to expand production and to compete with large commercial producers; these include agricultural extension and credit facilities, transport services, development of irrigation, training and market information, all specifically targeted to the needs of smallholder farmers. Institutional support will also be required to build dynamic farmers' unions and cooperatives and to expand opportunities for farmer education (Lahiff *et al.*, 2005).

Lack of human capital has also been found to be a serious constraint for smallholder farmers. They are often illiterate with poor technological skills, which can become serious obstacles in accessing useful formal institutions that disseminate technological knowledge. The majority of smallholder farmers are not capacitated with financial and marketing skills and are unable to meet the quality standards set by fresh produce markets and food processors. Lack of production knowledge leads to lower quality in production (DAFF, 2012).

2.3 The role of credit in agricultural development

Agricultural credit encompasses all loans and advances granted to borrowers whether beneficiaries of agricultural reform or some others to finance and service production activities relating to agriculture, fisheries, forestry and also for the processing, marketing, storage and distribution of products resulting from these activities (Umoren *et al.*, 2014).

In terms of role of agricultural credit, Musuna and Muchapondwa (2008) argued that it is an important vehicle for agricultural development because it helps farmers cope

with the capital demands required to boost efficiency levels. Agricultural credit is an integral part of the process of modernization of agriculture and commercialization of the rural economy. Agriculture as a sector depends more on credit than any other sector of the economy because of the seasonal variations in the farmers returns and a changing trend from subsistence to commercial farming (Abedullah *et al.*, 2009). Thus farm credit plays a crucial role in agricultural and rural development as it enables farmers reap economies of scale, venture into new field of production, employ new technologies and empower them to provide utilities for a widening market (Ayegba *et al.*, 2013).

Agricultural credit is considered as one of the strategic resources for pushing agricultural production to high horizons consequently raising the living standards of rural poor farming communities. Hence, it plays a pivotal role in development of the economy. It has mainly two sources; informal and formal. Informal sources normally consist of commission agents, input providers, village shop keepers, friends and relatives. Out of these sources, credit from commission agents, shop keepers and input suppliers has more baneful effects on the rural poor. Evidence suggests that such loans further aggravate rural poverty as the interest rate on informal credit is exorbitantly high (Nasir, 2007). It is a general practice that the smallholder farmers obtain loans in the form of cash or inputs like seed, fertilizers and pesticides.

Among the major factors of agricultural production, credit has been regarded as one of the essential factors. This is because the adoption of most farm technologies involves the purchase of improved inputs by the farmers. Few farmers have the financing resources to make such huge purchases and lack of credit becomes a major constraint on agricultural development. Agricultural credit has often been pencilled as the panacea for increased agricultural production and productivity. According to Igben and Eyo (2002), credit is important in agricultural production and it also helps to alleviate the problems of the rural dwellers particularly in the time-lag between planting and harvesting. Credit to farmers helps in breaking the vicious cycle of poverty characterized by low productivity, low income, low savings and investments. More so, credit enables farmers to adopt more profitable farm enterprises as well as expansion of farm sizes to benefit from the economies of size.

According to Muhammad *et al.* (2003), three main factors that contribute to agricultural growth are the increased use of agricultural inputs, technological change and technical efficiency. Technological change is the result of research and development efforts, while technical efficiency with which new technology is adopted and used more rationally is affected by the flow of information, better infrastructure, availability of funds and farmers' managerial capabilities. Higher use and better mix of inputs also requires funds at the disposal of farmers. These funds could come either from farmers' own savings or through borrowings.

Agricultural growth depends very much on the improvement of infrastructural facilities, supply of enhanced irrigation water, land reclamation, transpiration, mechanical power and other critical farm inputs like seeds, pesticides and fertilizers etc. Timely availability of capital leads to adoption of improved seed, fertilizers and modern technologies which increase the farm production and ultimately the growth rate. Therefore, agricultural credit is an essential element for modernization in agriculture. In past few decades, the need of credit in the farming sector rapidly increased because of the rise in the use of fertilizer, pesticides, high yield variety seed and mechanization and rise in their prices (Muhammad *et al.*, 2014).

Nasir (2007) found that credit plays a pivotal role in development. It helps farmers to undertake new investments and adopt new technologies to increase agricultural yield. Lack of access of the rural poor to institutional loans has a negative impact for rural growth and well-being.

2.4 Access to credit for smallholder farmers in South Africa

According to Chisasa (2014), access to credit by smallholder farmers in South Africa still remains a confounding problem. In South Africa, it is estimated that the majority of the rural population most of whom rely on agriculture for their livelihood, still have no access to formal credit (Chisasa, 2014). The specific circumstances of smallholder farmers with respect to financial support services are believed to be deteriorating (Chisasa and Makina, 2012). However, their full potential has not been realized due to lack of access to credit required for the purchase of farm inputs and capital equipment.

Lack of credit facilities for smallholder farming in South Africa was found to be one major contributing factor towards the collapse of many smaller enterprises and a major cause for higher transaction costs in both input and output markets (Randela *et al.*, 2008; Drimie *et al.*, 2009). Poor farmers often have difficulty obtaining credit, and financial institutions are typically biased against smallholders, particularly women farmers. This was firmly supported by Adeniyi (2010) in the study carried out in South Africa on the challenges and perspectives of women farmers and agricultural growth; the study suggested that agricultural credit policy should be formulated to make credit facilities more accessible to women. The main reason often cited by banks for not lending to smallholder farmers is high default risk, uncertainty and risk inherent in agricultural production and marketing (Owusu-Antwi and Antwi, 2010). Other reasons cited are the high cost of lending to small farmers, lack of collateral, the low rate of interest on agricultural loans, and the long-term nature of agricultural loans which is not compatible with bank lending, particularly in situations of high risk.

However, there are mixed views on the role of government in facilitating access to finance, particularly by the poor. Claessens (2006), argues that government interventions to directly broaden access to finance are “costly and fraught with risks, among others the risk of missing the targeted groups”.

2.5 Agricultural credit in South Africa

According to Sandrey and Vink (2008), South African commercial farmers have historically been relatively well-advanced in terms of technology, although quite dependent on imported technology, whether through imported machinery and/or agrochemicals, or under license, as is the case for Genetically Modified (GM) seed. On the other hand, smallholder farmers have been less endowed in terms of technology. Prior to 1994, smallholder farmers did not benefit from state support while commercial farmers were supported by legislation and subsidy. The result was that smallholder farmers tilled small areas of land, with insufficient investment or institutional support (Oettle *et al.*, 1998).

According to Olawale and Garwe (2010), financial constraints are the principal obstacle to the growth of new Small and Medium Enterprises (SMEs).Generally, the

South African government have established parastatal institutions with the aim of channelling credit to smallholder farmers (Machethe, 2004). The establishment of parastatal institutions with a mandate to channel credit to smallholder farmers is one of the approaches used by the governmentto promote smallholder agricultural development (Machethe, 2004). Some of the parastatals that were established in the former homelands of South Africa for example Agricultural Development Banks of Ciskei and Transkei, Agribank of the North West Province etc. have collapsed as a result of transformation of agriculture in the country, thus leaving the smallholder farmers without access to credit services.

On the other hand, the Land Bank and the defunct Agricultural Credit Board were established to address the credit needs of commercial farmers. The Land Bank was expected to fill the vacuum created by the demise of homeland parastatals (Machethe, 2004). The mandate of the Land Bank has been broadened to include persons that were previously excluded from enjoying the services the bank provided. While the Land Bank has tried in reaching smallholder farmers with loans, the majority of these farmers still do not have access to credit (Sebopetji *et al.*, 2009).

The realisation of insufficient progress made in improving access to credit by smallholder farmers prompted the government to establish the Micro-Agricultural Finance Institutions of South Africa (MAFISA) in 2005 (DBSA, 2005). The scheme was implemented to assist in addressing the challenges of poverty and underdevelopment of those in the ruraleconomy. According to the state of the nation address (2006), MAFISA was introduced to provide financial support to small and emerging farmers, while leaving the Land Bank to concentrate on commercial farmers. According to 3ie (2014), MAFISA products and services were accessed through a network of institutions which was accredited by DAFF as retail intermediaries for MAFISA. This was to ensure the expansion of Small, Medium and Micro Enterprises (SMMEs), which would contribute to job creation in rural areas. The main purpose of MAFISA was to provide micro and retail agricultural financial services to economically active rural poor people on an affordable, diversified and sustainable basis. The launch of MAFISA pilot project was considered as a great initiative as its objectives were (NDA, 2006):

a) To provide funding through participating institutions for on-lending to target market.
b) To address financial services needs of the entrepreneurs in the second economy.
c) To strengthen the developmental agricultural micro finance system for the benefit of the target market.

Unfortunately the full rollout of MAFISA was not as expected. It was noted that in respect of MAFISA, the Department of Agriculture faced major challenges in terms of implementation of the programme. These challenges included the fact that the disbursement of MAFISA loans had started late, and there had been an interruption due to the suspension by the Land Bank and expiry of the pilot agreements. Further challenges included the lack of capacity, delayed establishment of accreditation committees, prolonged process lead-times, reliance on over-worked extension officers and a need to change the mind-set of final users to address high interest rates and address difficulties in accessing financial services (PMG, 2008)

In 2004, the provincial Department of Agriculture implemented the Comprehensive Agriculture Support Programme (CASP), the biggest support sub-programme at provincial level in all provinces except Gauteng and North West Provinces (Greenberg, 2010). CASP is a once-off grant and is designed to help smallholder farmers to participate in a market that is dominated by commercial agri-businesses, but without altering the logic of the market or production system. The fund that is awarded as part of the CASP is used mainly for bulk infrastructural development such as warehouses, access roads, irrigation systems, poultry houses and part of the funds is also spent on training and capacity building of smallholder farmers. Farmers apply on a yearly basis and grants are awarded over a five years period (Greenberg, 2010). The success of the implementation of the CASP programme has been uneven, although most provincial farmer support programmes have been expanded.

2.6 The Land Bank of South Africa

2.6.1 An overview of the Land Bank of South Africa

In South Africa the quest for sustainable and productive smallholder farming is borne out of the need to bring the previously disadvantaged farmers into the mainstream agricultural economy (Mmbengwa *et al*., 2010). The Land and Agricultural Development Bank of South Africa is regarded as a delivery tool for the government in developing the agricultural sector (Land Bank, 2011). The Land Bank is a specialist agricultural bank guided by a government mandate to provide financial services to the commercial farming sector and to agribusiness and to make available new, appropriately designed financial products that would facilitate access to finance by new entrants to agriculture from historically disadvantaged background. The Land Bank was established as an agricultural development finance institution in 1912 by the government of South Africa (Kahn, 2007). According to the Land Bank research report (2011), the main objective of the Land Bank is to promote and finance development in the agricultural sector of the economy of the country.

The mission of the Land Bank is

- To develop and provide appropriate products for commercial and development clients.
- To leverage private sector investment into the agricultural sector. To develop partnerships with intermediaries for on lending.
- To develop techniques for financing high-risk agriculture and new business areas.
- To support programmes of the Ministry of Land Affairs and Agriculture by aligning the Bank's products with these programmes.
- To contribute to rural development by linking up with government structures and activities which include the Land Redistribution for Agricultural Development (LRAD), Agricultural Sector Plan and the government's Integrated Sustainable Rural Development Strategy (ISRDS).

There were core strategies designed to ensure that the mission of the Land Bank becomes realized. The measurement of the bank’s successes in realising its mission is important not only to itself and its customers, but also to the entire nation, particularly because most of its resources have been provided by the State

(Mmbengwa *et al.*, 2010). The bank was formed to aid commercial agricultural production but over the past decades, this has changed as the Land bank provides various services for farm development to predominantly smallholder farmers. The challenges facing smallholder farmers can be mainly attributed to the gap in agricultural policy direction caused by rapid regulatory and market changes over the past two decades (Land Bank, 2011). The impact of deregulation of the agricultural sector in the 1990's compelled institutions supporting smallholder farmers to reassess their funding marketing and supporting approaches (Land Bank, 2011). Since 1994, ensuring that the smallholder farmers develop successfully has been a government priority.The government helped increase production of food through increasing smallholder farmers' access to financial services. A significant percentage of the Land bank's clientele would not normally receive funding from ordinary commercial banks (Sibanda, 2001).

The Land bank is the only primary development finance institution working in agriculture and rural development (Machethe, 2005). Other financial institutions formed by the government to smoothing the constraints faced by the smallholder farmers' in accessing agricultural credit in the former homelands have collapsed. Therefore, the Land bank was expected to broaden their mandate to include the smallholder farmers and other farmers from the collapsed financial institutions in the former homeland. The Land Bank does not receive any financial subsidy from the government but gets its money from the financial markets (OECD, 2006). The Land Bank does not pay tax and dividends to the government but uses some of its revenue to support development (OECD, 2006). Thus, some of the lending to agriculture could be provided at lower interest rates than from other commercial banks (Bekker, 2003).

According to the Land Bank annual report (2011), the South African Land and Agricultural Bank, operated in accordance with the Land Bank Act 13 of 1994 and was accountable to the Ministry of Agriculture and Land Affairs. The Land Bank had embarked on programmes and introduced policies to target particular sectors of South African society. This followed the establishment of the Presidential Commission on Rural Financial Services (Strauss Commission), which made recommendations to improve rural financial services. The Land Bank also introduced

measures that would arguably alleviate poverty and improve the living and working conditions of South Africa's farmers. According to Dolny (2001), the Strauss Commission's recommendation 51 stated that: "*The Land Bank must adopt a developmental approach to business, including attempts to influence the types of production loans financed. The development criteria for lending should include a good practice ethic in terms of clients applying the legally required health and safety standards of the Basic Conditions of Employment Act*". In May 2000, the Bank introduced a discounted interest rate for farmers creating jobs, improving living conditions, building proper housing, schools and clinics on their farms and adopting environmentally sustainable farming methods. The Land Bank also introduced a policy whereby the Department of Land Affairs (DLA) had first option to purchase land going up for auction (Land bank, 2003).

The new role of the Land Bank is governed by the Land and Agricultural Development Bank Act of 2002 (Act No. 15 of 2002). According to the OECD (2006), this Act formed the basis for continued existence of the Land Bank but with a renewed focus on providing financial services to promote and facilitate "equitable ownership of land, in particular the increase in ownership of agricultural land by historically disadvantaged persons". The Land Bank provides financial services on a purely commercial basis to a diverse range of clients, including rural entrepreneurs who have traditionally been denied access to credit. The Land Bank is guided by a new mandate, which requires it to promote rural development and support projects of the Comprehensive Agricultural Support Programme (CASP) (OECD, 2006). The Land Bank, besides financing commercial agriculture and agricultural industry has made progress in loan financing for land redistribution (LRAD) projects. As part of targeting of smallholder farmers, the Land Bank provides a range of financial products at special interest rates for these individuals (OECD, 2006).

2.6.2 Empirical studies of the Land Bank of South Africa

A study carried out by the Land Bank in 2011, showed that smallholder farmers fail to reach their maximum potential due to factors within their control as well as some beyond their control such as lack of finance and technical support. According to the Land Bank (2011), most of the smallholder farmers financed by the bank have been unable to service their loans.

Mmbengwa *et al*., (2010) conducted a research in South Africa on the assessment of the performance and sustainability of Land Bank customers among emerging farmers. Performance and sustainability of Land Bank emerging farmers was investigated using both the perception of the farmers and actual profit attained. The study revealed that the perception of the emerging farmers reflected more on their lack of capacity than the successes and failures of farming SMMEs. The study also showed that skills, finance and infrastructure were major success barriers for farming SMMEs. From this study, the profile of Land Bank customers was established. These profiles depict that the majority of these customers still suffered from lack of skills, financial access, infrastructure and extension services. This implies that major improvements in skills, finance, extension support and production are required.

Mmbengwa *et al.,* (2011) conducted a research to examine and determine the factors that promote either success or failure among emerging farmers who were clients or funded by the Land Bank. The study revealed that extension support, sole-proprietorship and business plans were found to be crucial for the farming supported farming small, micro and medium enterprises to succeed and be profitable.

2.7 Empirical studies on the determinants of agricultural credit access.

Table 2.1 below shows a summary of some of the studies on the determinants of agricultural credit access that were conducted in the past years

Table 2.1: A summary of the determinants of agricultural credit access studies

Title	Significant Variables	Analytical Model	References
Demand for credit in rural Uganda: who cares for the peasants?	Age, location, educational level, value of assets held by the household and occupation	Probit, tobit and multinomial logit model	Mpuga. P (2004)
Farm household economic behaviour in imperfect financial markets	Gender, educational level, household labour size, farm size, credit information and extension visits.	Stochastic frontier model	Hussein. H (2007)
Agricultural credit constraints and borrowing behaviour of farmers in rural Punjab	Collateral (Land), educational level and transitory income	Heckman procedure	Akram, W., Sial, Z., & Ijaz. (2008)
An application of probit analysis to factors affecting small-scale farmers' decision to take credit: a case study of Greater Letaba local municipality in South Africa	Gender, marital status, farming experience, age, farm size, education and membership to a farmers' association.	Probit model	Sebopetji, T. O & Belete, A. (2009)
Socio-economic determinants of farmers' loan size in Benue state, Nigeria.	Distance, annual income, previous loan status and farm size	Multiple regression and t-test	Oboh, V. U., & Kushwaha, S (2009)
Rural women access to credit: market imperfections and intra household dynamics.	Educational level, family labour, savings and collateral (assets)	Seemingly unrelated regression (SURE) model and the bivariate probit model	Fletschner, D. (2009)
Impact of Farm Credit on Farmers Socio-economic Status in Ogun State, Nigeria.	Farm productivity	Correlation analysis	Bolarinwa, K.K., & Fakoya, E.O. (2011)

Table 2.1: Continuation of summary of the determinants of agricultural credit access studies

Title	Significant Variables	Analytical Model	References
Determinants of access to credit in Nigerian agriculture	Age, access to other credit, access to extension services, financial contribution to his or her group, farm location, farm size and membership to a registered farm group.	Probit regression model	Oyedele, G. A., & Akintola, J. O (2012)
Factors determining access to formal credit in Ghana: A case study of smallholder farmers in the Abura-Asebu Kwamankese district of central region of Ghana	Savings account, educational level and extension contacts	Binary logistic regression model	Dzadze P., Osei Mensah J., Aidoo R. & Nurah G. K. (2012)
Technical efficiency in input use by credit and non-credit user emerging farmers in Maruleng Municipality of Limpopo Province, South Africa	Age of household head, level of education, family labour, size of farm, off farm income, land ownership status, credit repayment record, level of interest rate	Cobb Douglas production function and the ordinary least square model	Lefophane, M. H., Belete, A and Jacobs, I. (2012)
Impact of socio-economic characteristics of farmers on access to agricultural credit	Marital status, educational level, farm size and farm status	Logit model	Nouman, M., Siddiqi, M. F., Asim, S. M., and Hussain, Z. (2013)

Source: own design

From the Table 2.1 above the following summaries were made;

Mpuga (2004) conducted a research study in Uganda to investigate the factors which affect demand for agricultural credit. According to the study, majority of Uganda's financial sector was largely underdeveloped and concentrated in the urban areas, leaving majority of the agricultural producers in the rural population with no access. The findings of the study revealed that the demand for agricultural credit is strongly and significantly affected by the age, location, education level, value of the assets held by the household, occupation and other dwelling characteristics. The results of the study also showed that women shy away from applying for credit and they apply for lesser amount compared to men. The study further showed that for individuals in the rural areas, Non-Governmental Organisations (NGOs) or cooperatives, government programmes, relatives or friends, local community or group saving and credit associations were the major sources of credit which showed that formal commercial banks were out of reach of the rural individuals. On the other hand, the availability of different sources of credit and the distance to the district centres had limited effect on the demand for credit.

Hussein (2007), in a study on the farm household economic behaviour in imperfect financial markets discovered that the probability of choosing the formal credit sector was positively affected by gender, educational level, household labour and farm size. The results of the study further revealed that education, credit information and extension visits were more likely to increase the information base and decision making abilities of the farm households including the ability to compare advantages and disadvantages of choosing appropriate credit and production technology. The results of the study indicated that the choice of formal sector increases with the number of productive members of the farm household. The results also showed that low level of education of the farm household may have contributed to the limited use of formal sector credit by farm household. Furthermore, the result showed that men tend to borrow more from the formal and semi-formal sources than women do. The implication of this is that being a female reduces the likelihood of borrowing from the formal and semi-formal credit sectors where it increases the probability of borrowing from the informal credit sources.

Akram *et al*. (2008) conducted a research to identify constraints faced by farmers in availing credit. The Logit model was used to identify the borrowing behaviour of farmers and the factors which determine the credit constraints. The results revealed that collateral was one of the major constraints faced by farmers in acquiring credit and land was the only collateral acceptable to institutional sources of credit. While the level of education, transitory income, are the important determinants of the borrowing behaviour of the farmers.

Sebopetji and Belete (2009), in a study based on the application of probit analysis to factors affecting small-scale farmers' decision to take credit, a total of 73 farmers were involved of which 57 were non-beneficiaries and 16 were beneficiaries. Although the government had made some advances in broadening the access to credit, most small-scale farmers still did not have access to affordable credit and access to affordable credit is one of the most important factors affecting production. The results of this study showed that gender, marital status and farming experience had significant positive effects on the farmers' decision to use credit while the number of years of formal education, membership of a farmer to an association, size of arable land and farmers' age had a significant negative effect on the farmers' decision to use credit. According to Sebopetji and Belete (2009), these results made sense in the study area and areas with similar settings as highly educated small-scale farmers would have enough money to finance their production at a small-scale. They further recommended for the implementation of support programmes and services primarily targeted for small-scale farmers in rural areas such as that of the study area.

Oboh and Kushwaha (2009) conducted a study in Benue State, Nigeria, to identify the socio-economic characteristics which determine the size of loan borrowed by the farmers. Data was collected from randomly selected 300 beneficiaries of the agricultural credit who acquired a loan from the Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB). The study showed that majority of the loan beneficiaries had poor socio-economic background such as low level of education, small farm size, low annual income and high family size. Their findings suggested that the amount of credit borrowed by the farmers is significantly affected by distance, annual income, previous loan status, and farm size. While the gender, age,

household size and farming experience have significant relationship with the amount of credit borrowed.

Fletschner (2009) explained that those households which are more educated, wealthier and have more family labour can easily approach and access financial institutions. The farmers who have lack of land face many obstacles in accessing credit.

Bolarinwa and Fakoya (2011) conducted a research in Ogun State, Nigeria to study effect of farm credit on the socio-economic status of farmers. Information was collected from randomly selected 250 farmers; the farmers were stratified into beneficiaries and non-beneficiaries. The study showed there was inadequate provision of credit from formal institutions with about 40% of beneficiaries securing loans from formal institutions. The study found out that majority of the beneficiaries was literate which accounted for their access to credit institutions. Their findings suggested that there was a positive, significant correlation between securing loan from credit institutions and farmers' performance of production operations.

In a study carried out by Oyedele and Akintola (2012), in Oyo and Ondo states of Nigeria to investigate the determinants of households' access to agricultural production credit under the National Special Programme for Food Security (NSPFS), it was found out that the farmers' age, access to other credit, access to extension services, financial contribution of the farmer to his or her group, farm location, size of land and membership of a registered farming group were the most important variables that influences access to credit in the study area.

Dzadze et al. (2012), in a study conducted to identify factors that determine smallholder farmers' access to formal credit in the Abura-Asebu-Kwamankese district in the Central Region of Ghana, data was collected from a total of 100 farmers and officials of five formal lending institutions through cross sectional survey. Evidence from the study showed that 35% of farmers interviewed had access to formal credit whilst 65% had no access. The result showed that extension contact, possession of savings account, and educational level of the farmer were the principal factors that significantly influenced smallholder farmers' access to formal credit in the study area. To improve farmers' access to formal credit, the study recommended

that efforts should be made by the Ministry of Food and Agriculture (MoFA) to enhance farmer-extension agent contact by providing logistics on time for Agricultural Extension Agents (AEAs) to pay periodic visits to farmers in their communities. Also, farmers should be encouraged through periodic education and sensitization to save with Banks to improve access to formal credit.

Lefophane *et al*. (2013), in a study to examine the relative technical efficiencies in input use by credit and non-credit user farmers used a stratified random sample of 72 farmers of which 32 were credit users and 40 were non-credit users. The result of the study showed that the technical efficiency level between the credit users and non-credit users was too wide. From the result, it was stated that the technical efficiency of the credit users were significantly higher than that of the non-credit users. The result of this study was consistent with that of Nwaru et al. (2006), who discovered that the mean technical efficiency of 10 best performing credit using farmers was significantly higher than those of 10 best performing non-credit using farmers. Lefophane *et al*. (2013), according to the result of the study recommended that the existing credit programmes and other programmes that impact on the efficient disbursement of agricultural credit be reviewed, refocused and be more accessible to emerging farmers in order to improve efficiency in input use by emerging farmers.

Nouman *et al*. (2013) examined the impact of socio-economic characteristics of farmers on access to agricultural credit in Pakistan. Data was collected from a sample of 80 farmers who were randomly selected from only those farmers who have taken agricultural credit from Zarai Taraqiyati Bank Limited (ZTBL) and other commercial banks. The finding of the study showed a strong relationship existing between the access to agricultural credit and the socio-economic characteristics of the farmers. The amount of credit that could be borrowed was significantly affected by their marital status, educational level, farm size and farm status. Therefore, it was concluded that the characteristics of the farmer strongly affects the access to agricultural credit.

In view of the above studies on determinants of credit access, this study will employ principal component analysis to determine the principal factors or new uncorrelated variables that affect the ability of the smallholder farmers to access credit from the

land bank. The study also will also use the probit regression analysis to determine the relationship between the socio-economic characteristics of the smallholder farmers and their ability to access agricultural credit. Some of the factors in the studies above such as farmers' age, gender, marital status, household size, farming experience, farm income, land size, credit information, extension agent visits, membership of farmers' associations and a few more will be considered in this study. The studies above focused on different types of financial credit institution, some on formal credit and informal credit markets. This study will focus on the Land bank of South Africa as it is one of the foremost and still functioning sources of agricultural credit.

2.8 Determinants of access to agricultural credit to smallholder farmers

Access to affordable credit is one of the most important factors affecting production and therefore income of the poor. The poor access to agrarian and support services are attributed to socio-economic factors of the farmers as well as constraints encountered by these farmers in institutions. Smallholder farmers' access to formal agricultural credit is influenced by a number of factors which include household socio-economics characteristics, communication and institutional factors. The relationship between smallholder farmers' access to formal agricultural credit and each of the variables are discussed below.

2.8.1 Age

This refers to the number of years of the household head. As the number of years of the farmer increases the ability to perform certain tasks reduces. Older farmers are very risk evasive such that when credit is available to them they would not take it. Farmers who are old are reluctant to sign loan agreements. In a study by Sebopetji and Belete (2009) on factors affecting small-scale farmers' decision to use credit, it was found that the age of the farmers had a negative influence on the decision of the farmer to use credit. In this study, it is expected that access to agricultural credit will decline as smallholder farmers' age increases.

2.8.2 Gender

This refers to the sex of the household head. There is a general belief that women are discriminated against in the agricultural credit market while male headed households have greater participation in the agricultural credit market. This was supported by Mohamed (2003) in the study of access to formal and quasi-formal credit by smallholder farmers and artisanal fishermen, although this has changed over the years. Contrary to the general belief, Kedir (2007) observed from studies in Ethiopia that formal financial institutions offered more loans to female-headed households than male headed households. In this study, it is based on the general belief, that it is expected that being a male increases the chances of access to agricultural credit from the Land Bank.

2.8.3 Level of education

Education plays an important role in household decision making. Smallholder farmers who are educated are able to read, write, interpret information provided by the institutions, calculate the risk involved and make informed decisions on whether or not to take credit. Owour (2008) observes in Kenya that literacy and education level have a significant positive influence on farm households' ability to access credit information. In this study, it is expected that education would have a positive influence on smallholder farmers' ability to access agricultural credit from the Land Bank.

2.8.4 Farmers' experience

Farmers' experience refers to the number of years the farmer has been involved in farming. A farmer having more years in farming is more likely to have more knowledge on agricultural credit. Therefore, a farmer having more knowledge on agricultural credit is more likely to use such information to his or her advantage. Yehuala (2008) observed that, farmers' experience played a significant role in accessing formal agricultural credit. Therefore, smallholder farmers with more farm experience would likely access agricultural credit from the Land Bank.

2.8.5 Farm size

Farm size refers to the size of the farm of the household measured in hectares. The larger the size of the farm, the more the inputs needed to operate on the farm. According to Anyad and Hasnu (2007), the amount of agricultural credit used per acre by smallholder farmers increases as the size of the land holding increases. Based on this, farmers with larger farm sized might not be able to purchase the amount of inputs needed and thus increasing their demand for credit. Therefore, in this study, it is expected that farm size will have a positive influence on smallholder farmer access to agricultural credit from the Land Bank.

2.8.6 Off-farm income

Off-farm income refers to a situation where income is generated outside the farming business. This results in more household resources which can be used to purchase farm inputs. The higher the off-farm income, the less the farmer would demand for credit. Akram *et al*. (2008) conducted a research to identify constraints faced by farmers in availing credit, the results showed that transitory income is an important determinant of the borrowing behaviour of the farmer. In this study, it is expected that a higher off-farm income will have a negative influence on the smallholder farmers' access to agricultural credit from the Land bank.

2.8.7 Proximity to lending institution (Distance)

Hussein (2007), Yehuala (2008) and Tang *et al*. (2010) confirmed through empirical studies on credit access, that smallholder farmers are less likely to borrow from the formal financial sectors, the further their households are located from the financial institutions. Farmers located close to the financial institutions usually have easier access to information and travel less distances. Therefore, it is based on this that it is expected that farmers staying far away from the Land Bank would have less access to agricultural credit.

2.8.8 Extension services

Extension officers play an important role in making sure farmers stay informed. Access to information among smallholders is generally poor and is compounded by the lack of reliable and efficient means of disseminating information (Bienabe *et al*.,

2004).Farmers who were visited frequently by extension officers would have more information which might influence the demand and ability to access agricultural credit; this was supported by Adeola and Ayoade (2009). They noted that technology adoption and decision to use credit of the farm households are significantly influenced by extension contacts. The information disseminated by the extension officers includes credit providers, application processes, period of payments, terms and conditions of credit and other credit related information (Lefophane *et al.*, 2013). Therefore, it is expected that extension services would have a positive influence on the smallholder farmers' access to agricultural credit from the Land Bank.

2.8.9 Credit Information

Credit information refers to the awareness of the formal agricultural credit institutions information available to the smallholder farmers in the area and information on application requirements, credit repayment period, terms and conditions of the loan. Farmers who are aware of the information have a better chance of accessing credit that those with little or no information. Therefore, it is expected that in this study, credit information would have a positive influence on smallholder farmers' access to agricultural credit from the Land Bank.

2.8.10 Credit History

Credit history refers to farmers who have had access to credit in the past. Farmers who have repaid their previous loans are considered to be credit worthy and therefore have a good relationship with financial credit institutions. In a study to identify the socio-economic characteristics which determine loan size by the farmers by Oboh and Kushwaha (2009), previous loan status was an important determinant of credit access. Therefore, it is expected that in this study, smallholder farmers with good credit history will have a positive influence on the smallholder farmers' access to agricultural credit by the Land Bank.

2.8.11 Saving habits

Personal savings serve as a form of economic security for the farm household. It also provided formal financial institutions with a financial history on which they could base lending decisions (Dzadze *et al.*, 2012). Based on this, households with good saving habits are more likely to access credits than those with no savings or banking

history. According to a study carried out by Dzadze *et al*. (2012) on factors determining access to formal credit in Ghana, savings habit was considered one of the major determinants of access to credit. In this study, it is expected that savings will have a positive influence on the smallholder farmers' access to agricultural credit from the Land Bank.

2.8.12 Registered business

Registered business refers to the smallholder farms which are registered under the company Act or multi purposed groups or Farmer Based Organisations (FBOs). In a study by Dzadze *et al.* (2012), it was found that farmers formed ad-hoc groups to facilitate access to credit, this shows that being registered under a farmer based organisation (FBO) increases the chances of access to credit. Ortmann and King (2006), state that most smallholder farmers fail to register as cooperatives or groups of farmers so that they can access facilities. Most farmers for various reasons have no access to finance and access to relevant information to register as cooperatives and consequently they cannot be financially assisted by government. In most cases, the government has no enough funds to fund individuals as it is considered high risk and expensive to fund individual farmers.In this study, it is expected that registered businesses will have a positive influence on smallholder farmers' access to agricultural credit from the Land Bank.

CHAPTER 3 RESEARCH METHODOLOGY

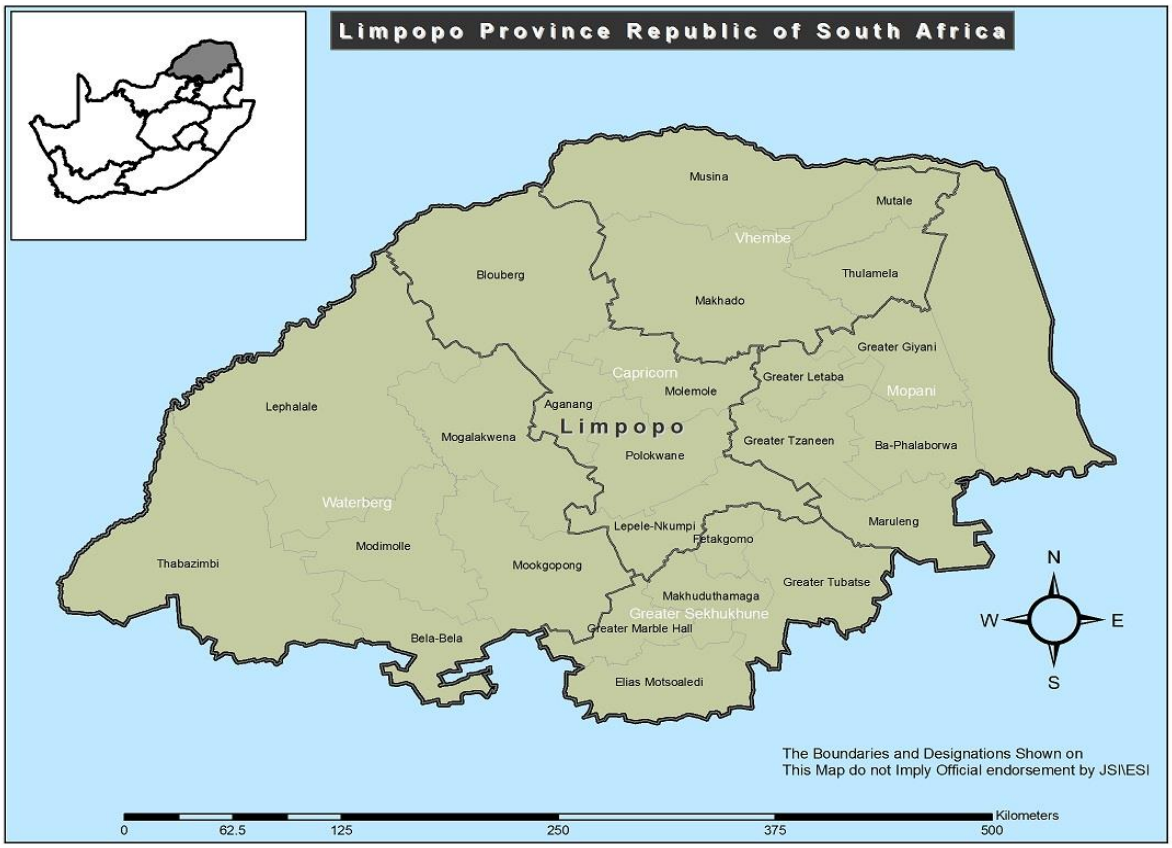
3.1 Introduction

The aim of this chapter is to describe the study area and to explain the methods used in the data collection phase as well as the research techniques that will be used to analyse data. Cross-sectional data on 62 smallholder farmers in the study areas was used. The data was collected by means of personal interview using structured questionnaires in a sample survey. The main research techniques used are the Principal Component Analysis (PCA) and the probit model analysis.

3.2 The Study Area

Limpopo province is one of the nine provinces of South Africa and is situated in the Northern part of the country. The capital of Limpopo province is Polokwane, formerly called Pietersburg. The Province was formed from the region of Transvaal Province in 1994 and initially named Northern Transvaal. In 1995, it was renamed Northern Province, which remained until 2003, when the name of the Province was formally changed to Limpopo Province.

The Province covers an area of 125 754 km^2 which represents 10.3% of the country's total area (STATS SA, 2010). This makes it the fifth largest province of the country's nine provinces in terms of area. Limpopo borders Zimbabwe to the north, Mozambique to the east and Botswana to the west. It is divided into five municipal districts namely Capricorn, Mopani, Sekhukhune, Vhembe and Waterberg Districts with 25 local municipalities. Mopani District Municipality comprises of five local municipalities: Ba-Phalaborwa, Greater Giyani, Greater Letaba, Maruleng and Greater Tzaneen.



Source: Map sharing (2010-2011)

Figure 3.1: Limpopo Provincial Map

The study was conducted in peri-urban areas of Tzaneen and Giyani which are situated in Greater Tzaneen and Greater Giyani Local Municipalities in the Mopani District of Limpopo Province, South Africa, respectively.

According to STATS SA (2011), Greater Tzaneen Local Municipality is situated in the eastern quadrant of the Limpopo province within the Mopani District Municipality. The seat of the municipality is Tzaneen. It is bordered by Polokwane to the west, Greater Letaba to the north, Ba-Phalaborwa and Maruleng to the east, and Lepelle-Nkumpi to the south. The Greater Tzaneen Municipality area encompasses the proclaimed towns of Tzaneen, Nkowankowa, Lenyenye, Letsitele and Haenertsburg. In addition, there are 125 rural villages concentrated in the South-east and North-west of the study area, with almost 80% of households residing in these villages (GTM, 2011). According to STATS SA (2011), it is estimated that Greater Tzaneen Municipality has a population of approximately 390, 095. According to GTM (2011), 66% of the total land area is privately owned, ranging from smallholdings to

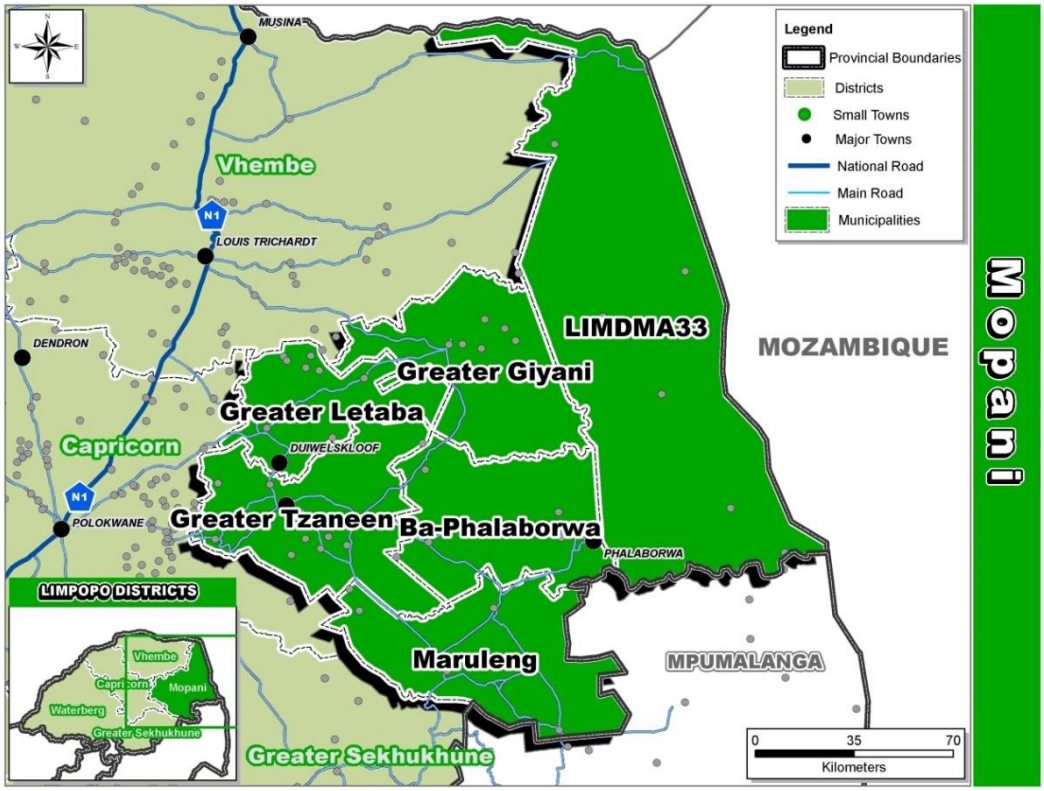
extensive farms used mainly for commercial farming activities. While 33% of the total land area is owned by the state, under the custodianship of six Traditional authorities.

Tzaneen is a large tropical garden town situated in the Mopani District Municipality of the Limpopo Province in South Africa. It is Limpopo's second biggest city after Polokwane. It is situated in the lush, high rainfall fertile region with tropical and subtropical agriculture taking place in a 20,000km^2 region. Tzaneen produces about 40% of South Africa's avocados, 40% of South Africa's mangoes, about 20% of South Africa's bananas and 90% of South Africa's tomatoes through its ZZ2 farms (STATS SA, 2011). According to STATS SA (2011), the number of agricultural households in Tzaneen are 36, 798. Agriculture is the key development in the rise of Tzaneen. Tzaneen depends on farming different types of fruits and vegetables, in the rearing of animals and other life forms of food used to sustain and enhance human life. The villages and townships around Tzaneen include; Modjadji village, Nwamitwa village, Petanenga village, Mariveni village, Mogapeng, Ga-masoma, Hwetji and many more.

Greater Giyani Municipality is one of five (5) local municipalities falling within Mopani District Municipality in Limpopo Province. According to STATS SA (2011), Greater Giyani Local Municipality was established in 1969. The town Giyani is located approximately 185 km from Polokwane, 100 km from Thohoyandou and 550 km from Pretoria. The municipality covers approximately 2967, 27km² area with only one semi-urban area being Giyani. The municipality is demarcated into 30 wards and has 60 Councillors. The municipality has 10 traditional authority areas comprising of 91 villages. Giyani town is the largest centre of population concentration, employment opportunities, shopping and recreational facilities (CRDP, 2010). The economic activity that mostly takes place in Greater Giyani both formal/informal are: small-scale agriculture (maize, vegetables, tomatoes, and beef), services, transport and retail development. There are however, a number of factors impacting negatively on the economic growth such as geographical location (distance to markets), shortage of skills, poor infrastructure, climatic conditions and diseases (HIV and Malaria). The municipality has potential for tourism and conservation development due to the existing natural heritage sites through the area, mining, abandoned farming

schemes, processing of natural products (Mopani Worm and Marula Fruit) (CRDP, 2010).

Giyani is a town in the Limpopo province in North-eastern South Africa. It is located in the heart of Limpopo Bushveld, on the northern bank of Klein (little) Letaba River west of Kruger National park. Giyani is the administrative capital of Mopani District Municipality. Giyani lies 470 km northeast of Johannesburg by road, 104 km from Tzaneen and 105 km from Phalaborwa gate of the Kruger National park. Giyani is situated within the sub-tropical zone. Giyani's economy is predominantly rural based. Cattle ranching and producing maize, tomatoes, potatoes, bananas, peanuts and mangoes form the backbone of farming.



Source: Map sharing (2010-2011)

Figure 3.2: Map of the Mopani District Municipality

3.3 Data collection

The study used primary data, which was collected through a field survey. The method that was used to collect information was face-to-face interviews using structured questionnaires. The structured questionnaire was designed to collect information on farmers' socio-economic characteristics that were assumed to determine the smallholder farmers' access to agricultural credit from the Land Bank. The characteristics included: farmers' age in years, gender, marital status, number of years of formal education, size of arable land in hectares, membership of famers' association, farming experience in years, number of visits by agricultural extension officers and credit officers. Data was collected from a sample of loan beneficiaries and non-beneficiaries.

3.3.1 Sampling Procedure

A sample of 62 smallholder farmers was used in this study. The study targeted the peri-urban areas of the Mopani District Municipalities, namely Tzaneen and Giyani. The study used the snowball sampling technique as the population was unknown due to the sensitivity of the study. According to the Protection of Personal Information Right act (POPI, 2013), the Land Bank is not allowed to disclose clients information. The researcher with the help of extension agents in the Department of Agriculture in Giyani found a few smallholder farmers who were beneficiaries and non-beneficiaries of the Land Bank of South Africa and had a will to take part in the study. The smallholder farmers identified by the researcher then helped identify other smallholder farmers who were also beneficiaries and non-beneficiaries of the Land Bank that were willing to take part in the study. The study used a sample of 62 smallholder farmers, a mixture of both beneficiaries (23) and non-beneficiaries (39) of the Land Bank. The non-beneficiaries are more than the beneficiaries because majority of the smallholder farmers in the study area were non-beneficiaries of the Land bank of South Africa. The number of smallholder farmers involved in the study from peri-urban areas of Giyani and Tzaneen were both 31 respectively.

3.3.2 Data Analysis

The data was captured into the Statistical Package for Social Sciences (SPSS) and then a regression analysis was carried out. For descriptive purposes, frequencies

and the descriptive statistics variables of the sampled smallholder farmers were estimated. Principal component analysis was carried out so as to get the principal factors or new uncorrelated variables that affect the ability of smallholder farmer to access credit from the Land bank; it was also used to profile or classify the farmers. After carrying out the principal component analysis, probit analysis was then used to determine the relationship between the socio-economic characteristics of smallholder farmers and their ability to access credit.

3.4 Empirical models

The study used two empirical models: the Principal Component Analysis (PCA) and the Probit regression model.

3.4.1 Principal Component Analysis

Principal Component Analysis (PCA) was used to transform socio-economic factors into an uncorrelated set of factors and this was use to profile the smallholder farmers. Principal Component Analysis (PCA) is a technique from statistics for simplifying a data set; it is useful for the compression and classification of data. It was introduced by Pearson (1901), and developed independently by Hotelling (1933), whilst the best modern reference is Jolliffe (2002). The aim of the method is to reduce the dimensionality of multivariate data whilst preserving as much of the relevant information as possible (Martin, 2007).

Principal component analysis is probably the most popular multivariate statistical technique and it is used by almost all scientific disciplines (Abdi and Williams, 2010). According to Abdi and Williams (2010), the principal component analysis analyses a data table representing observations described by several dependent variables, which are, in general, inter-correlated. Its goal is to extract the important information from the data table to express this information as a set of new orthogonal variables called Principal components. Principal component analysis is a linear transformation that transforms the data to a new coordinate system such that the new set of variables, the principal components are linear functions of the original variables are uncorrelated and the greatest variance by any projection of the data comes to lie on the first coordinate, the second greatest variance on the second coordinate and so on (Martin, 2007).

In practice, this is achieved by computing the covariance matrix for the full data set. Next, the eigenvectors and eigenvalues of the covariance matrix are computed, and sorted according to decreasing eigenvalue (Martin, 2007).

The goals of PCA are to;
(1) Extract the most important information from the data table;
(2) Compress the size of the data set by keeping only this important information;
(3) Simplify the description of the data set; and
(4) Analyse the structure of the observations and the variables.
In order to achieve these goals, PCA computes new variables called principal components which are obtained as linear combinations of the original variables. The first principal component is required to have the largest possible variance (i.e. inertia and therefore this component will 'explain' or 'extract' the largest part of the inertia of the data table). The second component is computed under the constraint of being orthogonal to the first component and to have the largest possible inertia. The values of these new variables for the observations are called factor scores, and these factors scores can be interpreted geometrically as the projections of the observations onto the principal components.

The PCs will be estimated as linear functions of the original ratings as shown by equation (1):
$PC_i = a_{i1}x_1 + a_{i2}x_2 + \text{----------} + a_{in}X_n$ ……equation 1
where a_i -------- a_{in} = the regression coefficients (or weights) for observed variable $_n$, as used in creating principal components and x_1---------x_2 are the subject's scores on observed variable $_n$.

3.4.2 Probit regression model

The Probit regression model was used in order to determine the relationship between the socio-economic characteristics of smallholder farmers and their ability to access credit. According to Nagler (2002), the probit model constrains the estimated probabilities to be between 0 and 1 and relaxes the constraint that the effect of the independent variable is constant across different predicted values of the dependent variable. The Probit model assumes that while we only observe the values of 0 and 1 for the variable of Y, 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 (Nagler, 1994). While the Probit model is more appealing than other linear probability models, it generally involves non-linear estimation and thus added computational costs. In addition, the theoretical justification for employing the probit model is often rather limited.

The model was selected because it is best suited to analyse the relationship between categorical variable and set of both categorical and continuous independent variables (Uchezuba et al. 2009). The study included farmers who are borrowers and non-borrowers. Selecting farmers who have access to credit and neglecting those who do not have access to credit could result in the problem of selectivity bias, which may result in the omission of other important variables and loss of valuable information. Therefore, there was a need to use the appropriate analytical techniques that incorporated observations otherwise on both borrowers and non-borrowers to overcome the problem of selectivity bias; hence the probit model was employed in this study.

A Probit model was used, in this form:

$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \beta_k X_{ki} + U_i$

Where:

Y_i = Dependent variable

β = coefficient;

X_i = factors that will be considered in the study

U_i = disturbance term

The Probit model specified in this study to determine the relationship between the socio-economic characteristics of smallholder farmers and their ability to access credit can be expressed as follows:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + \beta_{18} X_{18} + \beta_{19} X_{19} + \beta_{20} X_{20} + \beta_{21} X_{21} + \beta_{22} X_{22} + \beta_{23} X_{23} + \beta_{24} X_{24} + \beta_{25} X_{25} + U_i$$

Table 3.1: Definitions of variables

Y_i	Smallholder farmers' access to agricultural credit takes the value of 1 if a farmer got a loan from land bank in the last three years , 0 otherwise	A priori expectation
X_1	Farmers' age in years	-
X_2	Gender; 1 if male, 0 female	+
X_3	Marital Status; 1 if married, 0 otherwise	+ or -
X_4	Household size	-
X_5	Number of years of formal education	+
X_6	Farming experience in years	+
X_7	Farm income in Rands per annum	+
X_8	Off-farm income in Rands per annum	+
X_9	Pension; 1 if a farmers receives pension, 0 otherwise	+ or -
X_{10}	Grant; 1 if a person receives grants, 0 otherwise	+ or -
X_{11}	Employment; 1 if person is employed, 0 otherwise	+ or -
X_{12}	Land ownership; 1 if a land owner, 0 otherwise	+
X_{13}	Land size in hectares	+
X_{14}	Distance to the nearest town in kilometres	-
X_{15}	Extension services; 1 if the farmers has had access to extension service in the last three years, 0 otherwise	+
X_{16}	Credit information; 1 if the farmers has had access to credit information in the last three years, 0 otherwise	+
X_{17}	Bank account; 1 if the farmer has a bank account, 0 otherwise	+
X_{18}	Farmers association/group; 1 if the farmer belongs to an association/group, 0 otherwise	+
X_{19}	Co-operative; 1 if the farmer belongs to a co-operative, 0 otherwise	+
X_{20}	Loose assets; 1 if the farmer has loose assets such as livestock, vehicles, tractors etc., 0 otherwise	+
X_{21}	Fixed Assets; 1 if the farmers has fixed assets on farm such as buildings etc., 0 otherwise	+
X_{22}	Registered Business; 1 if the farmer operates under a registered business, 0 otherwise	+
X_{23}	Farm commodity; 1 if the farmer is a crop farmer, 0 otherwise	+ or -
X_{24}	Purpose of production; 1 if the farmers farms for sale, 0 otherwise	+
X_{25}	Farm records; 1 if the farmers keeps farm records, 0 otherwise	+

3.5 Justifications of the a priori expectation

3.5.1 Farmers' Age

According to table 3.1, an increase in the farmers' age could likely decrease the farmers' probability of accessing the agricultural credit from the Land Bank of South Africa. The justification for this is that as the smallholder farmer gets old, the process of applying for credit becomes tedious for the farmers and also the financial institutions find it difficult to provide credit for agriculture due to the risk involved in the business let alone an elderly smallholder farmer. According to Sebopetji and Belete (2009), in a study based on the application of probit analysis to factors affecting small-scale farmers' decision to take credit, farmers' age had a significant negative effect on the farmers' decision to use credit.

3.5.2 Gender of the smallholder farmer

According to table 3.1, the probability of the smallholder farmer to access agricultural credit from the Land Bank would likely increase if the farmer is male. The implication of this is thatfemale smallholder farmers face challenges, with many of them struggling to gain access to financial assistance to start their enterprises, because they often have no assets to put up as necessary surety (Dludla, 2014).

3.5.3 Marital Status

According to table 3.1, the probability of the smallholder farmer to access agricultural credit from the Land Bank would likely increase or decrease depending on the marital status of the farmer. Part of the requirements to access loan from the Land Bank of South Africa is to make available a marriage certificate, ante-nuptial contract (marriage out of community) or certified copy of divorce decree. According to Nouman *et al.,* (2013), in a study carried out to examine the impact of socio-economic characteristics of farmers on access to agricultural credit in Pakistan, marital status had a significant effect on the farmers' access to agricultural credit.

3.5.4 Household size

According to table 3.1, an increase in the number of the household size would likely decrease the probability of the farmer accessing agricultural credit from the Land Bank. If the number of the smallholder farmers' household increases, the farmer is

less likely to access the credit because they would see the size of the household as responsibility of the farmer which may lead to him or her not using the full funds for its purpose and would instead use part of it for the family, hence face difficulty to pay back the loan. According to Sebopetji and Belete (2009), in a study based on the application of probit analysis to factors affecting small-scale farmers' decision to take credit, farmers' household size had a significant negative effect on the farmers' decision to use credit.

3.5.5 Education

According to table 3.1, an increase in the number of years of education for the smallholder farmer is likely to increase the probability of the farmer to access agricultural credit from the Land Bank. The implication of this is that, educated farmers would have better knowledge of credit which also means the pros and cons of credit, so they are better informed than their uneducated counterparts. According to Baiyegunhi and Fraser (2014), in a study to determining smallholder farmers' access to credit in the Amathole District Municipality, Eastern Cape province, South Africa, education had a significant positive effect on the farmers' ability to become a credit user.

3.5.6 Farm experience

The farm experience can be said to go with age and the predicted expectation from table 3.1 for the age of the farmer is negative then in this case it would be right to say farm experience should be negative too but from the table 3.1, the more years of experience the smallholder farmer has the more likely the farmer would access agricultural credit from the Land Bank. The experience of the farmer would help him or her make better decisions on credit matters and the experience is also an added advantage, the creditors would see. According to Sebopetji and Belete (2009), in a study based on the application of probit analysis to factors affecting small-scale farmers' decision to take credit, farmers' experience had a significant negative effect on the farmers' decision to use credit.

3.5.7 Farm income

Table 3.1 shows that an increase in the farm income of the farmer would likely increase the probability of the smallholder farmers' access to agricultural credit from

the Land Bank. If the farmer has had a couple of productive years, the farmer would stand a better chance of accessing credit. According to Anang *et al.* (2015), in a study on factors influencing smallholder farmers' access to agricultural credit in Northern Ghana, farm income had a positive and significant relation with access to credit. Smallholder farmers are usually resource-poor and have little capital endowment. An increase in farm capital therefore could indicate that the farmer is better-off economically or an innovator which could facilitate access to credit.

3.5.8 Off-farm income

According to table 3.1, an increase in the off-farm income of the smallholder farmer would likely increase the probability of the farmers' access to credit from the Land Bank. One of the requirements of accessing loans from the Land Bank is that if the farmer has another source of income, the proof should be provided. If the farmer has an alternative source of income it would be an added advantage as the Land Bank would be confident that they have a stable client and certain of being repaid. According to Akram *et al.,* (2008), in a study to identify constraints faced by farmers in availing credit, off-farm income had a significant positive effect.

3.5.9 Pension

Based on the predicted expectation on table 3.1, the smallholder farmer is likely to increase or decrease his or her probability of accessing credit from the Land Bank if the farmer receives pension. The pension received by the farmer can be seen as another source of income by the Land Bank and they can also see the farmers' receive of pension as the farmer being old and risky to invest in.

3.5.10 Grants

Based on the predicted expectation on table 3.1, the smallholder farmer is likely to increase or decrease his or her probability of accessing credit from the Land Bank if the farmer receives grants. The grants received by the smallholder farmers are for specific purposes such as for illness, child support and many more. The grant received by the farmer can be seen as another source of income by the Land Bank while the Land bank may see it as a disadvantage because the grant was given to the smallholder farmers for other forms of responsibility besides agriculture.

3.5.11 Employment

Based on the predicted expectation on table 3.1, the smallholder farmer is likely to increase or decrease his or her probability of accessing credit from the Land Bank if the farmer is employed. If the farmer is employed the Land Bank may see the farmer as having another source of income which is good because the probability of them getting repaid is high. The Land Bank may also see him as a part-time farmer and also as not an immediate priority as there are other people with no other source of income and need their services more.

3.5.12 Land size

According to table 3.1, an increase in the farm size of the smallholder farmer is likely to increase the farmers' probability of accessing agricultural credit from the Land Bank. The larger the farm, the more fund it needs to be productive. If the smallholder farmer has a large farm size he or she is more likely to access credit as the farmer has the potential of solving the issue of food security in the vicinity it is situated.In a study carried out by Oyedele and Akintola (2012), in Oyo and Ondo states of Nigeria to investigate the determinants of households' access to agricultural production credit under the National Special Programme for Food Security (NSPFS), it was found out that the size of land was an important variable that influences access to credit in the study area.

3.5.13 Distance to the nearest town

According to table 3.1, the probability of accessing credit from the Land Bank decreases the farther the smallholder farmer and his farm is situated to the nearest town or the nearest financial institution or department of agriculture. The farther the farmer is to the town, the chances of him or her having recent and vital credit information is low. According to Mpuga (2004) in a study to investigate the factors which affect demand for agricultural credit, it was found out that the location of the farm significantly affects the demand for agricultural credit.

3.5.14 Farmers Association

Based on the predicted expectation on table 3.1, the smallholder farmer is likely to increase his or her probability of accessing credit from the Land Bank if the farmer

belongs to a farmers' association. If a farmer belongs to an association, the farmer would likely not only have information on the type of agriculture they do but also have information on credit. According to Sebopetji and Belete (2009), in a study based on the application of probit analysis to factors affecting small-scale farmers' decision to take credit, belonging to a farmers' association had a significant positive effect on the farmers' decision to use credit.

3.5.15 Cooperative

Based on the predicted expectation on table 3.1, the smallholder farmer is likely to increase his or her probability of accessing credit from the Land Bank if the farmer belongs to a cooperative. One of the requirements in accessing credit from the Land bank is to provide details of cooperative the farmer belongs to. So if a farmer belongs to a cooperative the farmer is likely going to receive agricultural credit from the Land Bank.

3.5.16 Loose assets and fixed assets

According to table 3.1, the probability of accessing credit from the Land Bank of South Africa increases if the smallholder farmer has loose and fixed assets. One of the requirements of accessing credit form the Land Bank is to provide a specified list of loose assets (livestock, vehicle, tractors and implements) with values and models. If a smallholder farmer has loose and fixed assets he or she would likely be a beneficiary of the Land Bank.Fletschner (2009) explained in a study of rural women access to credit; that those household which are wealthier can easily approach and access financial institutions. The farmers who have lack of land face many obstacles in accessing credit.

3.5.17 Registered business

Based on the predicted expectation on table 3.1, the smallholder farmer is likely to increase his or her probability of accessing credit from the Land Bank if the farm of the smallholder farmer is being registered as a business. One of the requirements of accessing credit from the Land Bank is for the farmer to provide the tax details; therefore if the farm is registered as a business the more likely he or she would access agricultural credit from the Land Bank.

3.5.18 Farm commodity

Based on the predicted expectation on table 3.1, the smallholder farmer is likely to increase or decrease his or her probability of accessing credit from the Land Bank depending on the farm commodity. This variable is a dummy variable with crop farmers taking the value of 1 and other type of farmers taking the value of 0. The type of farming the farmer is involved in would not affect whether or not the farmer would be a beneficiary of the Land bank.

3.5.19 Purpose of production

This variable is a dummy variable with the farmers farming for the purpose of sales being given the value of 1 while farmers farming for the purpose of consumption are given the value of 0. The predicted expectation from table 3.1 shows that the probability of the farmer accessing credit from the Land Bank increases with the farmer farming for the purpose of sale. If the farmer is farming for the purpose of sale it means the farmer is willing to sell to the market and make profit so the farmer stands a better chance of repaying the loan to the Land Bank.

3.5.20 Farm records

One of the major requirements of accessing loan at the Land Bank is for the farmer to provide the important farm records. According to table 3.1, if the farmer keeps his or her farm records up to date and accurately he or she has increased their chances of accessing credit from the Land Bank. The farm record will show the history of the farm and the farmer and it would give the Land Bank the confidence they need to be able to make the farmer a beneficiary.

CHAPTER 4: RESULTS: DESCRIPTIVE STATISTICS

4.1 Introduction

The aim of this chapter is to present the results of the descriptive analysis. The chapter specifically describes the nature of the data used in the study and also provides brief summaries of the variables which were considered and their measures. The results are presented in tabular forms and interpreted individually.

Table 4.1: Descriptive statistics of some of the socio-economic characteristics and factors of the sampled smallholder farmers.

Variables	Total N=62	Beneficiaries N =23	Non-beneficiaries N = 39	Minimum	Maximum	Standard deviation
Age				33	77	11.117
< 40	12 (19.35%)	4 (17.39%)	5 (12.82%)			
40 – 49	20 (32.26%)	11 (47.83%)	11 (28.21%)			
50 – 59	15 (24.19%)	3 (13.04%)	13 (33.33%)			
60 – 69	12 (19.35%)	4 (17.39%)	8 (20.51%)			
>70	3 (4.84%)	1 (4.35%)	2 (5.13%)			
Total	62 (100%)	23 (100%)	39 (100%)			
Mean age	51	49	53			
Household size				2	14	2.602
< 5	22 (35.48%)	8 (34.78%)	4 (10.26%)			
5 – 9	35 (56.45%)	13 (56.52)	29 (74.36%)			
>10	5 (8.06%)	1 (4.35%)	6 (15.38%)			
Total	62 (100%)	23 (100%)	39 (100%)			
Mean household size	7	6	7			
Level of education				0	17	3.083
Primary	17 (27.42%)	5 (21.74%)	11(28.21%)			
Secondary	39 (62.90%)	12 (52.17%)	28 (71.79%)			
Tertiary	6 (9.68%)	6 (26.09%)	0 (0%)			
Total	62 (100%)	23 (100%)	39 (100%)			
Mean level of education in years	11	12	11			

Table 4.1: Continuation of descriptive statistics of some of the socio-economic characteristics and factors of the sampled smallholder farmers.

Variables	Total N=62	Beneficiaries N =23	Non-beneficiaries N = 39	Minimum	Maximum	Standard deviation
Farm experience (years)				2	30	5.866
0 – 9	31 (50%)	15 (65.22%)	16 (41.01%)			
10 – 19	27 (43.54%)	6 (26.07%)	21 (53.85)			
20 – 29	3 (4.84%)	2 (8.7%)	1 (2.56%)			
>30	1 (1.61%)	0 (0%)	1 (2.56%)			
Total	62 (100%)	23 (100%)	39 (100%)			
Mean farm experience	51	49	53			
Distance to the nearest town (km)				1	45	10.899
≤ 10	19 (30.65%)	8 (34.78%)	11 (28.21%)			
11 – 20	13 (20.97%)	6 (26.09%)	7 (17.95%)			
21 – 30	22 (34.48%)	5 (21.74%)	17 (43.59%)			
31 – 40	6 (9.68%)	3 (13.04%)	3 (7.69%)			
< 50	2 (3.23%)	1 (4.35%)	1 (2.56%)			
Total	62 (100%)	23 (100%)	39 (100%)			
Mean distance to the nearest town	19	17	21			

Table 4.1: Continuation of descriptive statistics of some of the socio-economic characteristics and factors of the sampled smallholder farmers.

Variables	Total N=62	Beneficiaries N =23	Non-beneficiaries N = 39	Min	Max	Standard deviation
Annual farm income (rands)				18000	96000	22363.183
< 30000	9 (14.52%)	0 (0%)	9 (23.08%)			
30000 – 60000	35 (56.45%)	5 (21.74%)	30 (76.92%)			
60000 – 90000	13 (20.97%)	13 (56.52%)	0 (0%)			
> 90000	5 (8.06%)	5 (21.74%)	0 (0%)			
Total	62 (100%)	23 (100%)	39 (100%)			
Mean annual farm income (rands)	54322.58	64413.79	41846.15			
Annual off-farm income (rands)				0	15600	26161.477
< 40000	51 (82.26%)	17 (73.91%)	34 (87.18%)			
40000 – 80000	10 (16.13%)	5 (21.74%)	5 (12.82%)			
80000 – 120000	0 (0%)	0 (0%)	0 (0%)			
12000 - 160000	1 (1.61%)	1 (4.35%)	0 (0%)			
Total	62 (100%)	23 (100%)	39 (100%)			
Mean annual off-farm income (rands)	16548	22234.78	13194			

4.2 Descriptive statistics

4.2.1 Age of household head

As indicated in table 4.1, the average mean age of the household head was 51 years, with minimum and maximum ages of 33 and 77 years respectively. The average age of the smallholder farmers that access agricultural credit and those that did not access agricultural credit was 49 and 53 years respectively. A majority of the sampled smallholder farmers were in the age range of 40 - 49 years and majority of the Land Bank beneficiaries were in this age bracket. The result shows that smallholder farmers who had access to agricultural credit from the Land Bank were relatively younger as compared to those who did not access agricultural credit from the Land Bank.

4.2.2 Household size

According to table 4.1, the average household size of the sampled respondents was found to be 7 persons. The largest family was 14 and the smallest was 2. The result from table 4.1 shows that from the total sample of households about 74.36% of the non-beneficiaries and 56.52% of the beneficiaries had the household size that ranges from 5 – 9. The result indicates that smallholder farmers that were beneficiaries of the Land Bank had a household size mean of 6 persons while the smallholder farmers that were non-beneficiaries had a household size mean of 7. Therefore, this shows that the smallholder beneficiaries of the Land Bank had one less person than their counterparts that were not beneficiaries.

4.2.3 Level of education

Higher levels of education imply better technical knowledge, know-how and farming skills, more information on credit markets and facilities. The overall average of the level of education in years for the sampled smallholder farmers was 11 years while the farmers that had access to agricultural credit was also 12 years compared to the 11 years of the farmers who did not have access to agricultural credit. A majority of the sampled smallholder farmers in the study area completed their secondary education with only a few going as far as tertiary education. The implication of this is that farmers with secondary level of education are more conversant and with information which helps them to easily associate with credit sources and better

technologies of farming. Overall, smallholder farmers with agricultural credit access had a higher education level compared to the farmers with no agricultural credit access.

4.2.4 Farm income and off-farm income

On average, the annual farm income of the sampled smallholder farmers was R54322.58, with that of the farmers who had access to agricultural credit being R64413.79 and those that did not have agricultural credit access being R41846.15. The minimum farm income was R18000 while the maximum was R96000. The average annual off-farm income of the sampled smallholder farmers was R16548.39, while the average off-farm incomes of the beneficiaries and non-beneficiaries were R22234.78 and R13194 respectively. The minimum off-farm income was zero and the maximum off-farm income was R156000. The result shows that the smallholder farmers who benefitted from the Land Bank had more average farm income and off-farm income.

4.2.5 Land size

According to table 4.1, the overall average size of arable land is 8 hectares, the average size of arable land of those that had agricultural credit access and those that did not have access were 8 and 7 respectively. The minimum land size in hectares was 2 hectares while the maximum was 15 hectares. The result shows that the smallholder farmers that were beneficiaries of the Land Bank had one hectare of land more than their counterparts that were not beneficiaries.

4.2.6 Distance to the nearest town

The long distances travelled to the Land Bank or department of agriculture by the smallholder farmers' results in high transportation cost because formal agricultural credit institutions are mainly located in urban areas. In order to determine this variable, the sampled smallholder farmers were asked how far their farm was to the nearest town in kilometres. On average, the distance for all the sampled farmers was 19km, with those that had agricultural credit access being 17km and those that did not have access being 21km.The minimum distance was 1km while the farthest distance was 45km from the town. The result shows that the smallholder farmers

who were beneficiaries were relatively closer to the town than their counterparts who were non-beneficiaries.

Table 4.2: The percentages of the dummy variables

Variable	Total (62)	Smallholder farmers with credit access (23)	Smallholder farmers without credit access (39)
Gender	Male: 67.7%	Male: 78.26%	Male: 61.54%
	Female:32.3%	Female: 21.74%	Female: 38.46%
Marital Status	Married: 81.1%	Married: 95.65%	Married: 82.05%
	Otherwise: 18.9%	Otherwise: 4.35%	Otherwise: 17.95%
Pension	Receives pension: 22.6%	Receives Pension: 21.74%	Receives Pension: 23.08%
	Does not receive pension: 77.4%	Does not receive pension: 78.26%	Does not receive pension: 76%
Grants	Receive grants: 22.6%	Receive grants: 17.39%	Receive grants: 25.64%
	Does not receive grants: 77.4%	Does not receive grants: 82.61%	Does not receive grants: 74.36%
Employment	Employed: 22.6%	Employed: 34.78%	Employed: 15.38%
	Unemployed: 77.4%	Unemployed: 65.22%	Unemployed: 84.62%
Farm association	Belongs: 74.2%	Belongs: 100%	Belongs: 58.97%
	Does not belong: 25.8%	Does not belong: 0%	Does not belong: 41.03%
Cooperative	Belongs: 87.1%	Belongs: 100%	Belongs: 79.49%
	Does not belong: 12.9%	Does not belong: 0%	Does not belong: 20.51%
Loose assets	Have loose assets: 72.6%	Have loose assets: 100%	Have loose assets: 56.41%
	Does not have loose assets: 27.4%	Does not have loose assets: 0%	Does not have loose assets: 43.59%
Fixed assets	Have fixed assets: 33.9%	Have fixed assets: 44.82%	Have fixed assets: 25.64%
	Does not have fixed assets: 66.1%	Does not have fixed assets: 52.17%	Does not have fixed assets: 74.36%
Farm commodity	Crop: 61.3%	Crop: 60.87%	Crop: 61.54%
	Others: 38.7%	Others: 39.13%	Others: 38.46%
Registered business	Registered: 72.6%	Registered: 100%	Registered: 56.41%
	Unregistered: 27.4%	Unregistered: 0%	Unregistered: 43.59%

Source: Survey data (2015)

4.3 Explanation of table 4.2

4.3.1 Gender of household head

As indicated in table 4.2, the total male household heads that access agricultural credit were 67.7% while the female headed households were 32.3%. The percentage of male household heads for those that have had credit access is 78.26% while the female household heads were 21.74%. The result shows that male smallholder farmers had more access to agricultural credit than their female counterparts in this study. From the percentage of male to female farmers, it is right to say that majority of the sample size were males.

4.3.2 Marital status

According to table 4.2, of the sampled smallholder farmers, 87.1% were married while 12.9% of the sample size was not married, either divorced, separated etc. The percentage of the married smallholder farmers who were beneficiaries of the Land Bank was 95.65% while 4.35% were not married. The percentage of married farmers that were not beneficiaries was 82.05% while that of unmarried farmers that were non-beneficiaries was 17.95%. The result shows that majority of the farmers in the study were married.

4.3.3 Pension

Based on the results in table 4.2, the smallholder farmers involved in this study that receives pension were 22.6% while the farmers who do not receive pension were 77.4%. The smallholder farmers who were beneficiaries of the Land Bank and also received pension were 21.74% while does who were beneficiaries but do not receive pension were 78.26%. The farmers who were non-beneficiaries of the Land Bank and receives pension were 23.08% while the farmers who do not receive pension were 76.92%. The results shows that majority of the farmers involved in the study do not receive pension.

4.3.4 Grants

The grants include old age grants, war veteran grants and children grants. Based on the results in table 4.2, the smallholder farmers involved in this study that receives grants were 22.6% while the farmers who do not receive grants were 77.4%. The

smallholder farmers who were beneficiaries of the Land Bank and also received grants were 17.39% while does who were beneficiaries but do not receive grants were 82.61%. The farmers who were non-beneficiaries of the Land Bank and receive grants were 25.64% while the farmers who do not receive grants were 74.36%. The result of this shows that majority of the sampled respondents do not receive grants.

4.3.5 Employment

According to the results on table 4.2, the smallholder farmers involved in this study that are employed were 22.6% while the farmers who are not employed were 77.4%. Smallholder farmers who were beneficiaries of the Land Bank and also employed were 34.78% while does who were beneficiaries but are not employed were 65.22%. The farmers who were non-beneficiaries of the Land Bank and also employed were 15.38% while the farmers who are not employed were 84.62%. The result shows that majority of the smallholder farmers in this region are full-time farmers with only a few percentage being part-time farmers.

4.3.6 Farmers' association

According to table 4.2, of the sampled smallholder farmers 74.2% belonged to farmers' association while 25.8% did not belong to a farmers' association. The percentage of farmers that belonged to farmers' association and were beneficiaries was 100%. The farmers who were not beneficiaries and did not belong to a farmers' association were 43.59 while those that belonged but did not benefit were 58.77%. The result shows that smallholder farmers that belong to farmers' association had more access to agricultural credit than the farmers that do not belong to farmers' association.

4.3.7 Cooperative

According to table 4.2, of the sampled smallholder farmers 87.1% belonged to cooperative while 12.9% did not belong to a cooperative. The percentage of farmers that belonged to cooperative and were beneficiaries was 100%. The farmers who were not beneficiaries and did not belong to a cooperative were 20.51% while those that belonged but did not benefit were 79.49%. The result shows that smallholder farmers that belong to cooperatives had more access to agricultural credit than the farmers that do not belong to cooperatives.

4.3.8 Loose assets

According to table 4.2, of the smallholder farmers involved in this study 72.6% have loose assets while 27.4% do not have loose assets. The percentage of the farmers who were beneficiaries and also have loose assets were 100%. The percentage of farmers who were not beneficiaries but have loose assets were 56.41% while the farmers who did not have loose assets and did not benefit from the Land Bank were 43.59%. The result shows that for a great percentage of smallholder farmers accessing agricultural credit had loose assets

4.3.9 Fixed assets

According to table 4.2, of the smallholder farmers involved in this study 33.9% have fixed assets while 66.1% do not have fixed assets. The percentage of the farmers who were beneficiaries and also have fixed assets were 47.82% while the farmers who were beneficiaries but did not have fixed assets were 52.17%. The percentage of farmers who were not beneficiaries but have fixed assets were 25.64% while the farmers who did not have fixed assets and did not benefit from the Land Bank were 74.36%. The result shows that majority of the smallholder farmer in the study area do not have fixed assets which is a characteristic of smallholder farmers. The result shows that if a smallholder farmer has fixed assets he or she would more likely access agricultural credit from the Land Bank.

4.3.10 Farm commodity.

This variable is a dummy variable with crop farmers taken the value of 1 and other type of farmers taking the value of 0. Based on the results of table 4.2, the smallholder farmers involved in the study that were crop farmers were 61.3% and those that did other types of farming were 38.7%. The smallholder farmers who were beneficiaries and are crop farmers were 60.87% while the farmers who were beneficiaries but did other forms of farming were 39.13%. The smallholder farmers who were not beneficiaries but are crop farmers were 61.54% while the farmers who did not benefit but did other forms of farming were 38.46%.

4.3.11 Registered business

Based on the results of table 4.2, the smallholder farmers involved in the study that registered their farms as businesses were 72.6% and those that did not register were 27.4%. The smallholder farmers who were beneficiaries and also registered their farms as businesses were 100%. The smallholder farmers who were not beneficiaries and registered their farms as businesses were 56.41%while the farmers who did not benefit and also did not register were 43.59%. The result shows that a greater percentage of smallholder farmers accessing agricultural credit have registered businesses.

CHAPTER 5: RESULTS: EMPIRICAL ANALYSIS

5.1 Introduction

This section presents the empirical results from the two analytical tools used. The results of the principal component analysis and probit analysis as well as the interpretation of the results would be discussed. The results of the principal component analysis would include the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test, communalities, total variance explained, rotation component matrix and classification of the smallholder farmers based on socio-economic characteristics while the result of the probit analysis will include the probit regression coefficients of factors determining smallholder farmers' access to agricultural credit from the Land Bank.

5.2 Principal Component Analysis

This section presents the empirical results from the principal component analysis (PCA). There are various economic, demographic, socio-economic, physical, institutional and communicational factors that limit smallholder farmers to access credit from the Land Bank of South Africa. However, the variables that were considered in this study were the most influencing factors in the study area. The goal of the PCA is to extract the important information from the data table and to express this information as a set of new orthogonal variables called principal components. Principal component analysis was performed on the variables so as to get the principal components that enable smallholder farmers' access agricultural credit from the Land Bank. Six components were extracted from the original variables of smallholder farmers' access to agricultural credit from the Land Bank of South Africa. The six extracted components explained 64.5% (Table 7) of the variations in the original variables of the smallholder farmers' access to agricultural credit from the Land Bank of South Africa. The six retained components are (i) Old experienced and educated smallholder farmers (ii) Business-oriented smallholder farmers (iii) Part-time smallholder farmers (iv) Smallholder farmers who receive grants based on their gender (v) Smallholder farmers with fixed assets and their distance to the nearest town (vi) Smallholder farmers who belong to cooperatives.

5.2.1 Interpretation of Results from Principal Component Analysis (PCA)

Table 5.1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.635
Bartlett's Test of Sphericity	Approx. Chi-Square	592.978
	df	190
	Sig.	0.000

The KMO measure of sampling adequacy tests whether the partial correlations among items are small. The Kaiser-Meyer-Olkin measure of sampling adequacy varies between 0 and 1, and the values closer to 1 are better. A value of greater than 0.5 is suggested to be the minimum (Field, 2005). The KMO in Table 5.1 is 0.635 which is above 0.5 is satisfactory. Bartlett's Test of Sphericity helps test the null hypothesis that the correlation matrix is an identity matrix. An identity matrix is a matrix in which all the diagonal elements are 1 and all off diagonal elements are 0. According to Table 5.1, the Bartlett's Test of Sphericity was significant at 0.000, which means there was a relationship between the variables included in the analysis. The significant level was small enough to reject the null hypothesis, which means that the correlation matrix was not an identity matrix. The Bartlett's Sphericity test and the KMO index enables to detect if the researcher can or cannot summarise the information provided by the initial variables in a few number of factors.

Table 5.2: Communalities

	Initial	Extraction
Age	1.000	.838
Gender	1.000	.844
Marital status	1.000	.548
Household size	1.000	.600
Education	1.000	.708
Farm experience	1.000	.774
Pension	1.000	.776
Grants	1.000	.816
Employment	1.000	.808
Land size	1.000	.610
Distance to the nearest town	1.000	.517
Fixed assets	1.000	.648
Farm commodity	1.000	.653
Farmers association	1.000	.736
Cooperative	1.000	.783
Registered business	1.000	.614
Farm records	1.000	.618
Farm income	1.000	.775
Off-farm income	1.000	.775
Loose assets	1.000	.459

Extraction Method: Principal Component Analysis.

The proportion of each variable's variance that can be explained by the principal component is called Communalities. Principal component analysis works on the initial assumption that all variance is common; therefore before extraction the communalities are all 1. The values in the extraction column indicate the proportion

of each variable's variance that can be explained by the principal components. Note that according to table 5.2, loose assets has the lowest communality of 0.459, which indicates that the loose asset variable is less well explained by the analysis than any other variable

Table 5.3: Total variance explained

Component	Initial Eigenvalues			Rotation sums of squared loadings		
	Total	% of Variance	Cummulative %	Total	% of Variance	Cummulative %
1	4.667	23.336	23.336	4.426	22.128	22.128
2	2.979	14.897	38.233	2.459	12.297	34.424
3	1.993	9.965	48.198	2.095	10.473	44.897
4	1.771	8.854	57.052	1.977	9.884	54.781
5	1.360	6.801	63.853	1.549	7.743	62.525
6	1.128	5.638	69.491	1.393	6.966	69.491
7	.941	4.706	74.197			
8	.841	4.206	78.402			
9	.796	3.979	82.381			
10	.658	3.292	85.673			
11	.636	3.180	88.853			
12	.541	2.706	91.558			
13	.360	1.802	93.360			
14	.321	1.603	94.963			
15	.269	1.345	96.307			
16	.220	1.099	97.406			
17	.182	.910	98.317			
18	.153	.763	99.080			
19	.123	.613	99.693			
20	.061	.307	100.000			

Extraction Method: Principal Component Analysis.

Table 5.3 reports the variance explained by each component as well as the cumulative variance explained by each component as well as the cumulative variance explained by all the components. Table 5.3 shows the amount of variance in the total collection of variables which is explained by the component. Component 1 explains 22.128% of the variance in the item, component 2 to component 6 explains 12.297%, 10.473%, 9.884%, 7.743% and 6.966% of the variance in the items in the component respectively. The cumulative percentage column contains the cumulative percentage of the variance accounted for by the current and all preceding components. According to table 5.3, the

6^{th} row shows a value of 69.491. This means that the first six (6) components altogether account for 69.491% of the total variance.

Table 5.4: Rotated component matrix

	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6
Age	.907					
Pension	.857					
Farm experience	.855					
Education	-.821					
Household size	.724					
Marital status	-.490					
Farm income		.769				
Farm records		.700				
Farmers association		.588				
Registered business		.575				
Land size		.556				
Off-farm income			.869			
Employment			.796			
Gender				.889		
Grants				-.856		
Farm commodity					-.774	
Fixed assets					.670	
Distance to the nearest town					.431	
Cooperative						.876
Loose assets						.415

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Table 5.4, shows all the components that were extracted from the analysis. The rotated component matrix, sometimes referred to as the loadings, is the key output of the Principal Component Analysis. It contains estimates of the correlations between each of the variables and the estimated components. Looking at table 5.4, it is clear that there are 6 components. The variables labelled, age, pension, farming experience, education, household size and marital status were substantially loaded on component 1 (Old and experienced smallholder farmers), while variables labelled farm income, farm records, farmers association, registered business and land size were loaded in component 2 (business-oriented smallholder farmers), the variables labelled off-farm income and employment were loaded in component 3 (Part-time smallholder farmers), the variables labelled gender and grants were loaded in component 4 (Smallholder farmers who receive grants based on gender), the variables labelled farm commodity, fixed assets and distance to the nearest town were labelled were loaded on component 5 (Smallholder farmers with fixed assets and their distance to the nearest town) and finally the variables labelled cooperative and loose assets were loaded on component 6 (Smallholder farmers who belong to cooperatives).

Table 5.5: Profiling loan acquisition of smallholder farmers based on socio-economics characteristics using the extracted components.

Rank	Components
1	Business-oriented smallholder farmers
2	Smallholder farmers who belong to cooperatives
3	Part-time smallholder farmers
4	Smallholder farmers with fixed assets and their distance to the nearest town
5	Smallholder farmers who receive grants based on gender
6	Old and experienced smallholder farmers

From table 5.5, the extracted components were ranked according to the level of accessibility of agricultural credit from the Land Bank. The smallholder farmers that will fall into the first component are favourites to access agricultural credit from the Land Bank and the lower the farmer is ranked in table 5.5 the less likely they are to access agricultural credit from the Land Bank.

5.2.2 Classification of smallholder farmers based on socio-economic characteristics

5.2.2.1 Old and experienced smallholder farmers

The first component, i.e., old and experienced smallholder farmers explained 22.1% of the total variance in the original variables. Age, pension, farm experience, education, household size and marital status loaded heavily (>0.4) in this component. The loadings for smallholder farmers' age, pension, farm experience, household size had positive signs, implying that these variables are positively correlated. That is, relatively older farmers are likely to have more years of experience, receive pension and have a large household size. At the same time, this component is negatively associated with level of education and marital status. The smallholder farmers that would be categorized in this component based on the sample size will find it difficult to access agricultural credit from the Land Bank because of their old age, despite the farmers having the advantage of farming experience; they would still be classified as a risk. From the loadings on

component 1, it shows that the smallholder farmers in this category are old enough to receive pension and majority of them would likely have a maximum of high school education that's if majority of them are uneducated based on the past irregularities of the country. Therefore accessing agricultural credit from the land Bank of South Africa would difficult for this group of smallholder farmers.

5.2.2.2 Business-oriented smallholder farmers

The second component, i.e., business-oriented smallholder farmers explained 12.3% of the total variance in the original variables. Farm income, farm records, farmer's association, registered business and land size loaded heavily (>0.4) in this components. The loadings for all the variables had a positive sign, suggesting that smallholder farmers with high farm income may access agricultural credit from the Land Bank. Farmers that keep farm records, farmers that belong to farmers' association, have registered business and have a large size would likely access agricultural credit from the Land Bank. The signs on the loadings in this component are in line with the expected signs from table 3.2. This group of smallholder farmers are what the financial institutions would want to do business with especially the Land Bank of South Africa. Therefore, smallholder farmers that would be classified into this group would more likely access agricultural credit from the Land Bank.

5.2.2.3 Part-time smallholder farmers

The third component, i.e., part-time smallholder farmers explained 10.5% of the total variance in the original variable. Off-farm income and employment loaded heavily (>0.4) in this component. The loadings for the variable in this component had positive signs. The loadings indicate there is a positive correlation between off-farm income and employment. The signs of the loadings on component 3 are in line with the a priori expectations in table 3.2. This group of smallholder farmers would likely be beneficiaries of the Land Bank because they would be said to be financially able to repay the loan. The difference between the part-time smallholder farmers and the business-oriented smallholder farmers is that the business-oriented smallholder farmers take agriculture as a full-time job while the part-time farmers need to hire and supervise on few occasions.

5.2.2.4 Smallholder farmers who receive grants based on gender

The fourth component, i.e., smallholder farmers who receive grants based on gender explained 9.9% of the total variance in the original variables. The gender and grants variables loaded heavily (>0.4) in this component. The loadings for smallholder farmers' gender had a positive sign whereas the loading for whether a smallholder farmer receives grants had a negative sign. This indicates that the gender and grant variables are negatively correlated. This shows that not all the smallholder farmers receive grants, majority of the grant beneficiaries are females. In a research by Ferreira (2015) on social grants in South Africa, there are several forms of social grants; grants for older persons (> 60 years), disability grants, war veteran's grants, foster child grant, care dependency grant, child support grants (11.5 million recipients), grant-in-aid and social relief of distress. The majority of child grants beneficiaries (96%) are women and the grant has had an impact on women's empowerment in their poor communities (Pater et al., 2012). The CDSA report (2015) shows that grants monies are mainly used for food and some basic non-food items such as school fees and uniforms, health and transport.Therefore, since the loadings in this component are gender and grant, the male smallholder farmers in this group stand a better chance in accessing agricultural credit from the Land Bank than their female counterparts and the smallholders who receive grants would likely not be beneficiaries as they would be viewed by the Land Bank as being financially unable to repay the loan.

5.2.2.5 Smallholder farmers with fixed assets and their distance to the nearest town.

The fifth component, i.e., smallholder farmers with fixed assets and their distance to the nearest town explained 7.7% of the total variance in the original variables. The farm commodity (crop, livestock and otherwise), fixed assets and distance to the nearest town variables loaded heavily (>0.4) in this component. The loading for farm commodity had a negative sign while the loading for fixed assets and distance to the nearest town. This shows that there is a positive relationship between the distance to the nearest town and fixed assets. This result also conforms to the a priori expectation. The smallholder farmers in this group would likely be beneficiaries of the Land Bank because they have

fixed assets that could stand as collateral. The smallholder farmers that are closer to the nearest town or financial institutions would have better information and would be able to attend the functions on agricultural credit by financial institutions with the help of the department of agriculture, forestry and fisheries. This means that they would be better informed than the smallholders with farms located far from the nearest towns. Therefore smallholder farmers in this group would likely access agricultural credit because they are informed and have fixed assets for collateral.

5.2.2.6 Smallholder farmers who belong to cooperatives

The sixth component, i.e., smallholder farmers who belong to cooperatives explained 7% of the total variance in the original variables. The cooperative and loose assets loaded heavily (>0.4) in this component. The loadings for the variables in this component had positive signs. The loadings on component 6 are criteria that have to be met in order for farmers to access agricultural credit from the Land Bank. This result indicates that farmers that belong to cooperatives and farmers that have loose assets would access agricultural credit from the Land Bank of South Africa. This signs of the loadings in this component also conforms to the a priori expectation.

5.3 Probit regression results

This section presents the empirical results from probit regression analysis. The section focuses on discussing the factors that determine the smallholder farmers' access to agricultural credit from the Land Bank. The probit model was used to analyse data obtained from 62 smallholder farmers who were interviewed by means of a structured questionnaire. Of the 62 farmers sample, 23 had credit access in the last three (3) years and 39 had no credit access in the last three (years).

The table 5.6 summarizes the results of the probit regression coefficients of factors that determine the smallholder farmers' access to agricultural credit from the Land Bank.

Table 5.6: Probit regression coefficients of factors determining smallholder farmers' access to agricultural credit from the Land Bank

Variables	Estimates	Std. Error	Wald
Y_1	22.557	185.141	.015
AGE	-.038**	0.89	.186
GENDER	4.926**	2.651	3.451
MRTSTS	5.612	184.846	.001
HHS	-.462	.286	2.598
EDU	.843*	.387	4.635
FARMEXP	.085	.160	.285
FARMINC	5.240*	6.184	3.992
OFFINC	9.856	1.914	.265
PENS	.729	1.185	.379
GRNTS	3.879	2.218	3.058
EMP	-3.016	1.848	2.663
LANDSIZE	.420**	.218	3.732
DIST	-.050	.051	.965
FARMASS	-.094	1.233	.006
COOP	6.412*	3.081	4.329
LASSETS	.641	.413	2.409
FASSETS	2.588**	1.352	3.369
REGBUS	3.484*	1.098	10.073
FARMCOMM	.262	.491	.286
FARMREC	.436	.302	2.078
McFadden R^2: 0.741			
** Significant at 10%			
* Significant at 5%			

The McFadden R^2 is 0.741; this shows that 74.1% of the changes in the dependent variable (Y) which is the smallholder farmers' access to credit in the last three (3) years

are explained by the changes in the independent variable. A positive sign of the variable coefficient indicated that a higher value of the variable increases the likelihood of smallholder farmers' to access formal agricultural credit from the Land Bank and vice versa.

The result shows that gender, education, farm income, grants, land size, cooperative, fixed assets and registered business had significant positive influence on the smallholder farmers' access to formal agricultural credit from the Land Bank. This implies that smallholder farmers' with high farm income, high level of education, registered business, large farm size and belong to cooperatives would likely access credit from the Land bank.

Conversely, the age variable had a significant negative influence on the smallholder farmers' access to agricultural credit from the land bank in the last three (3) years. The implication of this is that chances of smallholder farmers' accessing agricultural credit from the land bank decreases with age.

5.3.1 Age

The coefficient of age is -0.038; the negative coefficient is statistically significant at 10%. The negative sign of the coefficient implies that when the smallholder farmers' age increases, the probability of accessing agricultural credit from the Land Bank decreases all other factors held constant. The implication of the negative influence of the age of the smallholder farmer on the probability agricultural credit access is that the aging farmers' may be unwilling to undergo lengthy credit application process which also indicates risk aversion of older farmers.

5.3.2 Gender

The coefficient of gender is 4.926; the positive coefficient is statistically significant at 10%. This variable is a dummy variable with male taking the value of 1 and female taking the value of 0. This implies that, a smallholder farmer is more likely to access agricultural credit from the land bank if the farmer is male all other factors held constant. The result of this study shows that majority of the beneficiaries are male that maybe

because majority of the sampled size are male but the result of this study is in line with that of Sebopetji and Belete (2009), who carried out a study on the factors affecting small-scale farmers decision to use credit. Also, according to the results of a study carried out by Hussein (2007) men tend to borrow more from the formal and semi-formal sources than women do. Therefore, being a female smallholder farmer reduces the likelihood of borrowing from the formal and semi-formal credit sectors where it increases the probability of borrowing from the informal credit sources.

5.3.3 Level of education

The level of formal education was statistically significant at 5% and has a positive influence on the smallholder farmers' access to agricultural credit from the Land Bank. The result implies that access to agricultural credit increases with increase in the level of formal education of the smallholder farmer, all other factors held constant. The implication of the positive influence on the probability of agricultural credit access is that farmers who have higher level of education have better knowledge and understanding of credit and therefore are more likely to access credit than their uneducated counterparts. This result is supported by Lefophane *et al*. (2013); they found out that as the farmers gets more formal education, the probability of obtaining credit increases.

5.3.4 Farm income

The farm income variable was statistically significant at 5% and had a positive influence on the smallholder farmers' access to agricultural credit. The result implies that agricultural credit access increases with an increase in the farm income of the smallholder farmer all other factors held constant. The implication of this is that the more the smallholder farmer earns the probability of accessing agricultural credit will increase because the Land Bank is sure the smallholder farmer will pay back the loan.

5.3.5 Grants

The grants variable was statistically significant at 10% and had a positive influence on the smallholder farmers' access to agricultural credit from the Land Bank. The result implies that smallholder farmers who receive grant are likely to receive agricultural

credit. Based on a research by Patel *et al.* (2015), majority of the child grant beneficiaries are women and the grant has had an impact on women's empowerment in their poor communities. This result is not in line with the a priori expectation as a negative sign was expected. The justification for this is that the Land Bank would like to help empower the smallholder farmers that receive grants but would likely give them less than they applied for.

5.3.6 Land size

The land size was statistically significant at 10% and had a positive influence on the smallholder farmers' access to agricultural credit. It implies that if the size of the farm increases by 1 hectare, smallholder farmers' access to agricultural credit will increase all other factors held constant. The implication of this is that the chances of smallholder farmers accessing agricultural credit increases with the size of the farm. The larger the farm size, the larger amount of inputs needed to operate the farm and therefore, a farmer of a large farm may use credit in order to purchase an adequate amount of input. The farmers with larger farms will be able to produce at the highest level if given credit and also help tackle food security around the study area.

5.3.7 Cooperative

The variable cooperative was statistically significant at 5% and had a positive influence on the smallholder farmers' access to agricultural credit. The result shows that agricultural credit access increases with the farmers' belong to a cooperative all other factors held constant. The implication of the result is that smallholder farmers who belong to a cooperative are better informed than farmers who are not. It also helps the productivity of the farmers as a group of farmers would use their cooperative to apply for agricultural credit.

5.3.8 Fixed assets

The coefficient of the fixed assets is 6.412; the variable was statistically significant positive at 10%. The results show that agricultural credit access increases with the farmer having fixed assets such as buildings, fences and source of irrigation all other

variables held constant. The implication of the result is that smallholder farmers who have fixed assets have better chances of accessing agricultural credit because majority of the farmers in the study area use permission to occupy (PTO) which cannot be used as a form of collateral, the fixed assets can stand as collateral.

5.3.9 Registered business

The registered business was statistically significant at 5% and had a positive influence on the smallholder farmers' access to agricultural credit. The result implies that agricultural credit access increases with the smallholder farmer registering his farm as a business venture. If the smallholder farmer registers his/her farm as a business which is one of the criteria for accessing agricultural credit from the Land Bank, the farmer has increased the probability of accessing loan.

CHAPTER 6 SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The chapter entails the main findings of the study and discusses the conclusion derived from the empirical results. The study has analysed the determinants of loan acquisition from the Land Bank of South Africa by smallholder farmers. The study was conducted in the peri-urban areas of Tzaneen and Giyani, located in the Mopani District Municipality in the Limpopo Province, South Africa. This chapter further suggest practical recommendations for policy makers to develop appropriate agricultural credit policy that will take into consideration the challenges faced by smallholder farmers in the study area.

6.2 Summary and Conclusion

Credit can be a crucial determining factor for smallholder farmer's success in South Africa. Agricultural credit is offered specifically for the purchase of agricultural inputs and equipment like seeds, fertilizers, poultry and animal feeds, tractors, ploughs etc. In South Africa, the Land Bank is the main source of agricultural credit for farmers. The challenge facing most formal credit institutions including the Land Bank is whether or not smallholder farmers will be able to repay the loan and this makes credit access a problem for both the formal financial institutions including the Land bank and smallholder farmer. According to this study, some of the constraints smallholder farmers' faces in accessing agricultural credit are lack of access to land, physical and institutional infrastructure. The lack of assets, information and access to services hinders smallholder farmers' participation in potentially lucrative markets. The result of the study also shows that majority of the smallholder farmers lack human capital. Majority of the smallholder farmers in this study had secondary education (62.9%) with only a few having tertiary education (9.68%). Therefore, they are not capacitated with marketing skills and are unable to meet the quality standard set by the market and food processors.

The result of the study shows that the average age of the smallholder farmer sampled was 51 years, with an average of 49 years for the smallholder farmers with agricultural

credit access and 53 years for the smallholder farmers who could not access agricultural credit from the Land Bank. This result shows that the smallholder farmers that were beneficiaries were relatively younger than their counterparts who were not beneficiaries. All the smallholder farmers in the sample cultivated on communal land (have no title deed to the land), thus land cannot be used as collateral for loans. Of the sampled smallholder farmers, the male and female farmers were 68% and 32% respectively. All of the male and female smallholder farmers that had access to agricultural credit were 78% and 22% respectively, while the male and female smallholder farmers who did not have access to agricultural credit were 62% and 38% respectively. It is evident that the sampled smallholder farmers were mostly male and majority of the smallholder farmers that accessed agricultural credit were also male. Overall, 81% of the sampled household were married while 96% of the smallholder farmers who had access to agricultural credit were married compared to 82% of those that could not access agricultural credit. The average farm income and off-farm income of the smallholder farmers who had agricultural credit access was higher compared to that of the smallholder farmers that did not have access to agricultural credit.

The average land size of the smallholder farmers who had agricultural credit access was higher compared to those smallholder farmers who could not access agricultural credit in the last three years. The average distance to the nearest town for the entire sample size of smallholder farmers in the study area was 19km while the average distance to the nearest town for the farmers who had access to agricultural credit was 17km compared to the 21km average distance to the nearest town by the smallholder farmers who did not access agricultural credit. The closer the farmer is to the urban area the higher the probability of access to agricultural credit from the Land Bank.

The Principal Component Analysis (PCA) extracted the important variables needed for smallholder farmers to be able to access credit from the Land Bank. In this study, the extracted variables were loaded into 6 components with a Kaiser-Meyer-Olkin (KMO) of 0.635. The extracted components were used to profile the smallholder farmers. The extracted components include;

- Component 1, i.e. old experienced and educated smallholder farmers which include age, pension, farm experience, education, household size and marital size.
- Component 2, i.e. business oriented smallholder farmers which include farm income, farm records, farmers' association, registered business and land size.
- Component3, i.e. part-time smallholder farmers which include off-farm income and employment.
- Component 4, i.e. smallholder farmers who receive grants based on gender which includes gender and grants
- Component 5, i.e. smallholder farmers with fixed assets and their distance to the nearest town which includes farm commodity, fixed assets and distance to the nearest town
- Component 6, i.e. smallholder farmers who belong to cooperatives and have loose assets which includes cooperative and loose assets.

The Principal Component Analysis (PCA) result shows that the entire variable in the components listed above have a bearing on the smallholder farmers' access to agricultural credit from the Land Bank. The result of the PCA on table 5.5 shows that the higher the smallholder farmer is ranked the more likely he or she would access agricultural credit from the Land Bank. From table 5.5, the highest ranked was the second component (business-oriented smallholder farmers) and the lowest ranked was the first component (old and experienced smallholder farmers). From the result, for a smallholder farmer to stand a chance to accessing agricultural credit the farmers should fall into component 2 (the business-oriented smallholder farmers).

The Probit analysis result shows that gender, education, farm income, grants, land size, cooperative, fixed assets and registered business had significant positive influence on the smallholder farmers' access to formal agricultural credit from the Land Bank. Conversely, the age variable had a significant negative influence on the smallholder farmers' access to agricultural credit from the land bank in the last three years. Whereas, marital status, farm experience, off-farm income, pension, loose assets, farm commodity and farm record had an insignificant positive influence while the household

size, employment, distance and farmers association variables had an insignificant negative influence on the smallholder farmers' accessing agricultural credit from the land bank. The McFadden R^2 is 0.741; this shows that 74.1% of the changes in the dependent variable (Y) which is the smallholder farmers' access to credit in the last three (3) years are explained by the changes in the independent variable. Based on the result of the probit analysis from this study, the variables that had the significant positive influences on determining the smallholder farmers' access to agricultural credit from the Land Bank of South Africa such as gender, education, farm income, grants, land size, cooperative, fixed assets and registered business shows that if the smallholder farmers increase in any of this positively significant variables, they would increase their chances of accessing agricultural credit from the Land Bank. While, the age variable that had a significant negative influence shows that if the smallholder farmer can increase in age the probability if the farmer accessing agricultural credit from the Land Bank will decrease.

6.3 Recommendation

Based on the results of the study, policy recommendations regarding improvement of smallholder farmers' access to agricultural credit from the Land are made.

The results of the study showed that the smallholder farmers that accessed agricultural credit in the last three (3) years were relatively younger than the farmers who did not have access to agricultural credit from the Land Bank. Many older people live in rural areas, where there are fewer services. They experience social and economic exclusion due to age discrimination and are often denied access to credit schemes.Department of information and communication in conjunction with credit and extension officers should contact frequent civic education on credit access, management and enterprise selection. The officers are to use face to face, electronic and print means of communication so as to reach less educated farmers. Agricultural extension officers should intensify dissemination of credit information to all farmers irrespective of the location. This can be done by regularly holding seminars and public functions (*imbizo*) with farmers on the benefits of applying credit, proper use and prompt repayment.

The result of the also study shows that smallholder farmers with more farm income and education level are more likely to access agricultural credit from the Land bank than their counterparts who have low farm income and lower level of education. The policies that foster education as a free basic education can significantly continue to contribute to rural poverty alleviation through improved access to financial skills and off-farm employment opportunities. Also an enabling environment should be created to improve farmers' accessibility to educational facilities. This can be achieved through mass education for rural dwellers and functional extension activities.

The South African policy makers have to make a major assessment or critical review of the Land Bank and other agricultural credit programmes in order to improve the smallholder farmers' access to agricultural credit. The results of the study revealed that most of the smallholder farmers sampled in the study area did not have access to agricultural credit from the Land Bank. The situation is likely to remain unchanged unless a decision is made to improve the availability of agricultural credit to the smallholder farmers. This could be made possible by determining credit needs of smallholder farmers. By determining this information, the government and other institutions could design agricultural credit programmes that are promptly responsive to the needs of the smallholder farmers.

The study suggests that the Land Bank of South Africa has to be reviewed to accommodate the needs of smallholder farmers and should be refocused and be friendly to the youth. Such policies should enhance education through sustained capacity building for farmers to improve their ability to read, analyse and interpret information. It is also recommended that the Land Bank to offer special monitoring programme for smallholder farmers and the interest rates charged should be lowered.

Evidence from the study showed that farmers that belong to cooperative had access to agricultural credit compared to their counterparts who did not belong to cooperatives. Collective marketing could play a very important role in establishing a link between the smallholder farmers. Acting collectively , smallholder farmers would be better positioned to reduce transaction costs for their marketing exchanges, obtain necessary market and

credit information, secure access to new technologies and tap into higher level markets allowing them to compete more effectively with large farmers and agribusinesses.

The study shows that the closer the smallholder farmers are to the town the more likely they are to access agricultural credit. The Land Bank and other agricultural institutions are located in the urban areas making it difficult for their target population to reach them because of the transaction cost. Most of the formal sources of credit for example, Land Bank and other agricultural financial institutions should be encouraged to open branches in rural areas and to promote rural micro finances to make credit easy for farmers to access.

Poor road infrastructure may raise transportation cost. Therefore, there is a need to upgrade and improve the roads in the study area. The projects should involve paving roads to and from different farms to assist farmers or buyers to access to the farms and markets.

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APPENDIX: QUESTIONNAIRE

DETERMINANTS OF AGRICULTURAL CREDIT ACQUISITION FROM THE LAND BANK OF SOUTH AFRICA: A CASE STUDY OF SMALLHOLDER FARMERS IN PERI-URBAN AREAS OF MOPANI DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA

NAME OF INTERVIEWER:

NAME OF RESPONDENT:

PLACE OF INTERVIEW:

CONTACT DETAILS:

DATE OF INTERVIEW:

A. INFORMATION OF THE HOUSEHOLD/FARMER

1. Name of the household head _____

2. Age of the household head _____

3. Gender of the household head. 1. Male ( ) 2. Female ( ). **(Tick the applicable answer)**

4. Marital status of the household head. **(Tick the applicable answer)**

Single	Married	Divorced	Widowed	Separated

5. Size of farmers' household _____

6. Highest level of education completed at school (indicate number of years attended) _____

7. How many years of farming experience do you have? _____

8. Main occupation of the household head.**(Tick the applicable answer)**

Fulltime farmer	Part-time farmer	Government Employee	Private company employee	Pensioner	Unemployed	Self-employed

9. Do you have off-farm income? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer)**. **If YES answer question 10 & 11 and if NO, please skip to question 12.**

10. What is the source of the off-farm income? **(Tick the applicable answer)**

Salary	Pension	Grants	Other

If other, specify_____

11. If the household head has an off-farm income, how much is the off-farm income per annum? _____

12. What is the farm income of the household per annum? _____

B. LAND HOLDING INFORMATION

13. Do you own land? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer)**

14. What kind of title deed or ownership do you have for the land?

Privately owned	Permission to occupy	Leased	Other

If other, specify _____

15. If it is Permission to Occupy (PTO), where did you get the (PTO) permit? **(Tick the applicable answer)**

Headmen	Tribal Office	Municipality	Local Government	Other

If other, specify _____

16. What is the size of your farm in hectares? _____

17. What is the distance from the farm to the nearest town? (In kilometres) _____

C. ACCESS TO SUPPORT SERVICES

18. Have you received extension services in the last three years? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer).If YES, please answer question 19 and if NO, please skip to question 20.**

19. Who provides the extension services?**(Tick the applicable answer)**

Government Department	Non- governmental organisation	Development agent	Other

If other, specify _____

20. Have you had access to agricultural credit information by agricultural credit officers in the last three (3) years? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer). If YES, please answer question 21 and if NO, please skip to question 22.**

21. Who provides the agricultural credit information services?**(Tick the applicable answer)**

Government Department	Non-Governmental Organisations	Land Bank	Development Agents	Other

If other, specify _____

22. How do you normally finance your agricultural activities? **(Tick the applicable answer)**

Land Bank	Government assistance	Social grants	Off-farm income	Farm income	Other

If other, specify _____

23. Have you ever received an agricultural loan? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer) If YES, answer question 24, 25 & 26 and if NO, please skip to question 27.**

24. When did you receive the agricultural loan? _____

25. Where did you borrow from?**(Tick the applicable answer)**

Commercial Bank	Land Bank	Money Lenders	Friends and relatives	Stockvel	Others

If other, specify _____

26. If the answer to the above question is the Land Bank, what was used as collateral? _____

27. Have you ever applied for a Land Bank loan? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer). If NO, answer question 28 but if YES, skip to question 29.**

28. Why was the loan request denied?

_____

_____

_____

29. What are the constraints you face specific to the accessing of loan from the Land Bank?

_____

_____

_____

_____

30. Who in the household received the loan? _____

If the answer to question 25 is the Land Bank and the recipient of the loan is different from the household head, please answer questions 31-36.

31. What is the gender of the recipient of the loan? 1. Male ( ) 2.Female ( ). **(Tick the applicable answer)**

32. What was the age of the recipient of the loan? _____

33. What is the marital status of the recipient? **(Tick the applicable answer)**

Single	Married	Divorced	Widowed	Separated

34. What is the size of the recipients' household? _____

35. What is the highest level of education completed at school by the recipient of the loan? (Indicate number of years attended)

_____

36. How many years of farming experience did the recipient of the loan have?

_____

37. Do you have a bank account? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer)**

38. Do you belong to a farmer association/group? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer)**

39. Do you belong to a cooperative? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer)**

40. Do you own any of the following below? **(Tick the applicable answer)**

Cattle	Vehicles	Tractors

If any other, please state them below

_____

41. Do you have fixed assets on the farm: Buildings ( ). **(Tick the applicable answer)**, if any other, please state below_____

42. Is your enterprise a registered business: 1. Yes ( ) 2. No ( ). **(Tick the applicable answer)**.

D. AGRICULTURAL PRODUCTION METHOD

43. What type of farming do you do? 1. Crop ( ) 2. Livestock ( ) 3. Both ( ). **(Tick the applicable answer)**

44. What is your main reason for production? 1. Sales in the market ( ) 2. Home consumption ( ) 3. Other ( ). **(Tick the applicable answer)**

If other, specify _____

45. Do you keep farm records? 1. Yes ( ) 2. No ( ). **(Tick the applicable answer)**

46. If the answer to the above question is yes, what type? **(Tick the applicable answer).**

Daily farm records	
Financial and expenditure records	
Crop and livestock records	
Labor records	
Miscellaneous records (Equipment repair and inventory)	
Agricultural inputs records	
Farm use record (Land use, farming method, planting and harvesting records)	
Other	

If other, specify, _____

47. Do you hire labour? 1. Yes ( ) 2.No ( ). **(Tick the applicable answer). If YES, please answer 48 and 49 and if NO, please answer 50.**

48. Do you hire: 1.Fulltime ( ) 2. Part-time ( ) 3. Both ( ) **(Tick the applicable answer)**

49. How many people did you hire in the last year? Fulltime _____, Part-time_____

50. If you do not hire labour what is your source of labour? 1. Family labour ( ) 2. Friend and relatives ( ) 3. Other ( ). **(Tick the applicable answer)** If other, specify _____

E. CONSTRAINTS SMALLHOLDER FARMERS FACE IN ACCESSING AGRICULTURAL CREDIT

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