

**GENDER ANALYSIS OF ACCESS TO FORMAL CREDIT BY SMALL-SCALE
FARMERS IN THE GREATER LETABA MUNICIPALITY**

by

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ABSTRACT

Agriculture has long been argued to be the dominant sector of the South African economy. Despite the huge agricultural potential of the country, the agricultural sector is underperforming in Less Developing Countries (LDCs) to some extent because female small-scale farmers, who play a vital role in agriculture, encounter credit constraints because of their gender and this in turn reduce their productivity. Therefore, the gender gap in terms of access to credit indicates that there is a need to reassess the problem of credit access by small-scale farmers on the basis of gender.

This study was carried out in the Greater Letaba Municipality (GLM) which is situated in the Mopani District of Limpopo Province, with the aim of analysing factors that influence formal credit access by both female and male small-scale farmers. Structured questionnaires were employed to collect the data for the analyses from 140 sampled small-scale farmers (70 males and 70 females) selected using stratified random sampling technique.

The findings of the probit regression model discovered that gender, extension services, land ownership, age, collateral and farm size had a significant positive influence on small-scale farmers' access to formal credit in the GLM. Additionally, the findings further revealed that household size, farming experience, farm-income, marital status had an insignificant negative influence on the small-scale farmers' access to formal credit whereas education level had an insignificant positive influence on the small-scale farmers' access to formal credit. On average, male and female small-scale farmers with access to formal credit were 71 % and 29 %, respectively whereas the male and female small-scale farmers without access to formal credit were 35% and 65%, respectively.

The female small-scale farmers' perceptions towards the credit system that were derived from the Principal Component Analysis (PCA) are as follows: (i) male small-scale farmers effortlessly get credit from banks contrasted with their female counterparts, (ii) small-scale farmers with more education and collateral tend to access formal credit than their counterparts and (iii) small-scale farmers who are nearest to

the banks are more likely to access credit than small-scale farmers who are far away. Based on the study findings, a set of recommendations for achieving equitable formal credit access by male and female small-scale farmers were put forward.

Keywords: Formal credit, Small-scale farmers, Gender analysis, Access to credit.

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DECLARATION

I, Mahasha Phetole Previous, declare that this mini-dissertation hereby submitted to the University of Limpopo for Master of Science in Agriculture (Agricultural Economics) has not been previously submitted by me for any degree at this university or any other university, this is my own work in design and execution and all material used has been acknowledged.

Signature: _____

Date: _____

DEDICATION

I (Mahasha Phetole Previous) dedicate this dissertation to my lovely mother (Mahasha Linah Moraka) and siblings (Kgadi Mahasha and Happy Mahasha).

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LIST OF ACRONYMS

CBCR	Cygnus Business Consulting Report
EDNs	Economically Developing Nations
FAO	Food and Agriculture Organization
Freq.	Frequency
GDP	Gross Domestic Product
GLM	Greater Letaba Municipality
GPFI	Global Partnership for Financial Inclusion
IMF	International Monetary Fund
KMO	Kaise-Meyer-Olkin of sampling adequacy
LDCs	Less Developing Countries
MFW4A	Making Finance Work for Africa
n.d.	no date
NGSA	National Government of South Africa
NLGA	North Local Government Area
NRF	National Research Fund
NSPFS	National Special Programme for Food Security
OECD	Organisation for Economic Co-operation and Development
PCA	Principal Component Analysis
ROSCAs	Rotating Savings and Credit Associations
SACCO	Saving and Credit Cooperative
SPSS	Statistical Package for the Social Sciences
SSA	Sub-Saharan Africa
SSF	Small-Scale Farmer
STATA	Statistics and Data
TREC	Turloop Research Ethics Committee
UNDP	United Nations Development Programme

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

Agriculture has long been the dominant sector of the South African economy because the country continues to depend on it to alleviate poverty, to improve food security and economic growth. The agricultural sector plays an influential role to the Gross Domestic Product (GDP) of the South African economy and remains the main economic activity that employs the vast majority of people. Furthermore, International Monetary Fund (2012) indicated that the agricultural sector hires more than half of the total labour force and provides a livelihood for masses of small-scale farmers within the rural population. Despite the huge agricultural potential of the country, the growth in agricultural production has failed to match the demand for agricultural products (Organisation for Economic Co-operation and Development, 2016; Vink and Van Rooyen, 2009).

The agricultural sector is underperforming in Less Developing Countries (LDCs) to some extent because female small-scale farmers, who are often a valuable resource in agriculture and the rural economy, encounter credit restraints because of their gender (Team and Doss, 2011; Food and Agriculture Organisation, 2011), and this in turn reduces their productivity. Despite the significant roles female small-scale farmers play in agriculture, they continue to have lesser productive resources and services at their disposal than male small-scale farmers (World Bank, 2009). Regardless of the contribution of female small-scale farmers to agricultural sector, it seems that they do not have the same control over and credit access as their male counterparts. Credit access amongst women is extremely low even if women constitute two fifths of the labour force (Ghosh and Vinod, 2017). Gender differences, which arise from the socially constructed relationship between women and men, influence how agricultural resources are being distributed and bring about various inequalities in development results (Oakley, 1978; Moser, 1989)

Ogunlela and Mukhtar (2009) also emphasised that gender differences reduced productivity in most of the farms and enterprises. The gender differences in access to credit, indicates that policy makers and analysts need to reassess the issue of credit

access by small-scale farmers based on gender. Gender differences in credit access must be examined seriously and giving loans to women will not merely fast-track their agricultural production but will decrease poverty and enhance their living standard (Ololade and Olagunju, 2013). Including women in agricultural agendas and improving their access to credit, markets and land would bring about instant change in reducing poverty, improving nutrition for families and food security (World Bank, 2005).

Credit has proven to be instrumental in alleviating poverty and developing rural areas if it is given equally amongst female and male small-scale farmers. The seasonality of small-scale farmers` activities and the uncertainty they are encountering makes them to be in need of credit. Credit plays an indispensable part in agricultural production activities because it helps the small-scale farmers to obtain necessary inputs that are required in increasing productivity (Feder *et al.* 1990). It is argued that the exact and appropriate input used is controlled by credit access (Bashir *et al.* 2010). Osuntogun (1980) is of the opinion that majority of small-scale farmers will remain constrained from adopting advanced technology if credit is not made available on suitable terms.

This implies that the capability of small-scale farmers to use advanced technology hinges on their access to credit. Kiplimo (2015) argued that one important way to enhance the agricultural productivity is by enhancing small-scale farmers` access to credit services so as to enable them to afford technologies and essential production inputs. Ojiako and Ogbukwa (2012) also viewed credit access as one of the crucial components in increasing productivity in agriculture. Zeller and Sharma (1998) further viewed credit provision to rural people especially small-scale farmers as an effective strategy for poverty reduction. In other words, formal credit access by small-scale farmers is one of the main driving forces behind economic development, which helps in alleviating poverty in most developing countries that invest their resources on agriculture.

As stated by Kebede (1995), credit is vital in ensuring that traditional agriculture is transformed into a modern agricultural sector by purchasing farm equipment, agricultural inputs and embracing modern technologies. Credit is considered as a crucial factor throughout the process of modernizing agriculture because it generates

and sustains satisfactory inputs flow, and therefore improving efficiency within the production of the farm. In brief, credit plays a fundamental role in expediting modernisation of agriculture and economic development, but this only take place if credit is easily available and employed efficiently.

1.2. Problem statement

Access to credit is considered as one of the main components in increasing agricultural productivity (Ojiako and Ogbukwa, 2012). Considering the nature of the environment as well as the cultural setting where agricultural endeavours are being practiced in South Africa, there is a compelling need to reassess the issue of access to credit by small-scale farmers based on gender. Worldwide, people are acknowledging the significance of gender equality on the issue of access to productive resources as well as the role that both women and men play in agricultural development. Credit provision is one of the crucial agrarian policies that policy makers need to reassess in the country especially looking at the gender disparities in agricultural resources distribution to the agricultural sector (Jeiyol, Akpan and Terver, 2013).

Furthermore, gender inequality in credit access is one of the few reasons which causes agriculture to fail to progress the way it ought to in South Africa. It is emphasized that gender inequalities caused a decline in the productivity of most farms and enterprises (Adesina and Djato, 1997; Ogunlela and Mukhtar, 2009). Johnson (2011) also showed the existence of gender differences in female small-scale farmers' ability to access credit as against their male counterparts. In other words, their access to credit continues to differ regardless of the equal roles they play in agriculture. It is therefore imperative for the study to explore the comparative gender analysis of access to formal credit by small-scale farmers in the Greater Letaba Municipality.

1.3. Rationale of the study

Several studies have been conducted in Economically Developing Nations (EDNs) on factors affecting credit access amongst small-scale farmers (Baiyegunhi and Fraser, 2014; Chauke *et al.* 2013; Dube *et al.* 2015), however most of these studies are not gender sensitive. In order to bridge this gap in the literature, this study examines

gender analysis of formal credit access in the Greater Letaba Municipality (GLM). A detailed understanding about factors affecting credit access amongst female and male small-scale farmers will be crucial to ensure that policy makers take proper steps to smoothen the creation of sustainable and suitable credit institutions, which will help in the development of agriculture in the rural areas. Previous studies have observed in agricultural production that female small-scale farmers are more constrained in terms of credit access than their male counterparts (Ogunlela and Mukhtar, 2009; Shultz, 2007).

Gender inequalities tend to decrease productivity particularly in agricultural production. Lack of credit access affects both female and male small-scale farmers in diverse ways and there are several constraints determining their lack of access to credit and capacity to increase their productivity and production (Jeiyol *et al.* 2013). In this regard, the study was carried out to examine comparative gender analysis of credit access by small-scale farmers in the Greater Letaba municipality.

1.4. Purpose of the study

1.4.1. Aim of the study

The aim of the study is to analyse factors that influence access to formal credit by both female and male small-scale farmers in the Greater Letaba Municipality.

1.4.2. Objectives of the study

The objectives of the study are to:

- a) Identify and describe the socio-economic characteristics of female and male small-scale farmers in the Greater Letaba Municipality.
- b) Determine the perceptions of female small-scale farmers towards the credit system in the Greater Letaba Municipality.
- c) Analyse and compare factors that influence access to formal credit by both female and male small-scale farmers in the Greater Letaba Municipality.

1.5. Research hypothesis

Socioeconomic characteristics of both female and male small-scale farmers in the Greater Letaba Municipality do not influence access to formal credit.

1.6. Limitations of the study

There were limitations to this study that should be considered when interpreting the study results. Firstly, the data accuracy relies on the information provided by the small-scale farmers. Most of the small-scale farmers were not keeping records of their information about farm operations and finances, hence the research depends on verbal information from small-scale farmers, who depend on memory recall. This means that any bias on their part would affect the results. Since most of small-scale farmers did not keep record of their information, it was difficult for them to answer some of the questions asked. Secondly, it was difficult to reach some of the small-scale farmers due to poor infrastructure and long distance to where the farmers were located. The extension officer summoned all the small-scale farmers to meetings and gatherings and the data was collected after the gatherings. This study is limited to gender analysis of access to formal credit and it concentrates more on formal financial markets not the informal financial market.

1.7. Organisation of the study

The remainder of the study progresses in this manner: In chapter 2, the relevant literature of the study is reviewed. In other words, it provides the review of the previous studies that have been carried out by other researchers in keeping with this study. Chapter 3 describes the study area and discusses methodology in detail which include the methods used in selecting and collecting the data as well as the analytical techniques employed in analysing the data collected in the study. Chapter 4 discusses the descriptive results and the empirical results from probit regression and Principal Component Analysis. The concluding chapter gives a summary of the results and draw pertinent conclusions and recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter provides an overview of the previous studies that have been carried out by other researchers in line with the gender analysis of small-scale farmers' credit access. It is divided into the following sections: definition of key concepts, credit role in rural development, types of credit, factors influencing small-scale farmers' formal credit access, empirical evidence on the determinants of credit access and summary of the literature reviewed.

2.2. Definition of key concepts

2.2.1. Credit

Credit has been defined by various authors in agricultural literature. Nwaru (2004) defined credit as the current and temporary way of transferring purchasing power from one individual who owns it to the other individual who needs it, and this gives the latter a chance of utilizing another individual's money for agricultural production purposes but believing in his readiness and ability to pay back at a stated future time. In other words, it is the process of monetising a promise and swapping the cash for a promise in the present-day with intentions of reimbursing in future with or without interest. The person who is borrowing the money should be willing and able to reimburse because promising to reimburse at a stated future day will be pointless.

Credit is referred as the method of gaining control over the use of money, goods and services in exchange for a promise to reimburse at a future day (Adegeye and Dittoh, 1985). Miller (1975) defines credit as a technique which is utilized to smooth the temporary purchasing power transfer from one person to another. As said by Phillip *et al.* (2009), credit includes all advances released for the use of small-scale farmers, to gratify farm needs at the right time with the aim of reimbursing it in future. Consequently, credit can be attained either from formal or informal financial institutions and can take the form of kind or cash.

2.2.2. Small-scale farmer

Kirsten and Van Zyl (1998) defined a small-scale farmer as a person whose operation scale is too tiny to entice service provision that he/she needs to be able to significantly improve his/her productivity.

2.2.3. Small-scale farmers access to formal credit

As said by Penchansky and Thomas (1981), to some authors "access" means entry into or use of the credit facilities whereas to others it symbolizes factors that influences entry or use. In this study, a small-scale farmer is considered to have access to credit if he/she can successfully borrow either the full amount, greater or less than the full amount of credit he/she applied for. On the contrary, a small-scale farmer is said to have no access to credit if his/her credit application is completely rejected.

2.2.4. Perception

According to Van den Ban *et al.* (1995), perception is the interpretation of information. The perception plays a key part in the decision-making process of people in general and small-scale farmers are not exempted from that. Small-scale farmers, for instance, must make decisions concerning seeds type, sowing and harvesting time, cropping patterns and to whom to sell the produce, etc. Small-scale farmers usually decide to adopt a management practice technology on the bases of their perceptions of benefit, cost and risk. Perceptions tend to be affected by the environments and they are relative instead of absolute. Diverse individuals can interpret the same object in different ways as a result of the past experiences, and this has an impact on how they behave.

2.2.5. Gender analysis

Gender analysis is an efficient way of gathering and examining information on social relations and gender differences in order to find, comprehend and redress inequities based on gender (Reeves and Baden, 2000). According to Lang (n.d.), gender analysis is a device used to examine the differences between the role played by both women and men, the various power levels they hold, their different needs, limitations and opportunities, and how these differences influence their everyday lives.

2.2.6. Gender

As stated by Moser and Planning (1993), gender is described as the responsibilities and roles of men and women that are socially constructed, and this also involves expectations held concerning features and expected behaviours of both women and men. Briefly, gender does not refer to men or women in isolation, but to the relationships among them. Sen (1999) defined gender as a collection of roles, behavioural patterns and traits which distinguishes men from women, which are created socially not biologically. Furthermore, these traits differ from culture to culture and changes over a specific time period. The gender notion does not only speak of men and women but significantly to the power relations among them.

2.2.7. Gender equality

Reeves and Baden (2000) indicated that gender equality means that women ought to have equal opportunities as men in life and this includes their capacity to be involved in the public domain. Additionally, gender equality is realized when men and women have equal opportunities and rights, and the power to give back to society.

2.3. Role of credit in rural development

Credit plays a crucial role in ensuring that any country all over the globe can realize agricultural development that is conducive and sustainable (Ololade and Olagunju, 2013). Credit aids the rural poor economy in numerous ways. Kitbur (1990) indicated that modernizing the agricultural sector need farmers to increase the current inputs they are using and this in turn lead to an increase in credit demand. This means that transforming agriculture needs more credit amount to purchase modern inputs that are going to be used in the production process. Kebede (1995) emphasises the importance of credit in ensuring that traditional agriculture is transformed into a modern agricultural sector by purchasing farm equipment, agricultural inputs and embracing modern technologies.

In EDNs wherein agriculture is still perceived as a risky venture, more credit might increase the willingness of small-scale farmers to embrace advanced technologies that are intended to increase their income levels and help also risk-averse small-scale farmers to take risks, for instance, making farming investments (Rosenzweig and

Binswanger, 1992). In other words, credit is considered as more than just another source of production factor because it influences farmer` access to various resources that are needed on the farm. Osuntogun (1980) is of the opinion that the majority of the small-scale farmers will remain constrained from adopting the advanced technology if not credit is made available on suitable terms.

This is to say that, a well-encouraged small-scale farmer without credit cannot purchase fertilizers, improved seeds and advanced technologies. Credit has proved to be instrumental in alleviating poverty and developing rural areas. Credit provision to people in rural areas especially small-scale farmers is also viewed as an effective strategy for poverty reduction (Zeller and Sharma, 1998). Credit boosts the agricultural productivity and increases the living standard of small-scale farmers by ensuring that vicious poverty cycles are broken among them (Etonihu *et al.* 2013; Adebayo and Adeola, 2008; Kosgey, 2013). Credit access has been recognized as one of the effectual devices that is helpful in reducing inequalities and bridging the poverty gap. Access to credit is seen as one of the significant components in enhancing agricultural productivity (Ojiako and Ogbukwa, 2012).

Moreover, credit access gives households the chance to smooth and to ensure that their consumption is stable especially when an adverse event occurs. Credit is an essential device which directly improves the household welfare through consumption smoothing that decreases their susceptibility to short-term income (Binswanger and Khandker, 1995). Harsch *et al.* (1994) noted that small-scale farmers have proven to be dynamic producers when they are given the chance to earn higher incomes. Credit further boosts small-scale farmer`s productive capability by allowing them to invest their finance in physical and human capital (Okurut *et al.* 2005). Credit is important in increasing the efficiency that the small-scale farmers need to perform agrarian activities (Mbata, 1991). Credit plays a significant part in developing agriculture and increasing job opportunities for people living in remote areas (Cygnus Business Consulting Report, 2004) and allows farmers to expand their operations.

2.4. Types of credit

The financial markets in EDNs, like South Africa, are dichotomous in nature and they are usually classified into two markets, namely, formal and informal financial institutions (Ghate, 1992). The financial sector, comprised of the formal and informal sectors, plays a key role in financial intermediation (Levacic and Rebmann, 1982) in developing countries. The financial markets of many EDNs are commonly described through the coexistence among the informal and formal credit markets (Mohieldin and Wright, 2000; Barslund and Tarp, 2008). The informal and formal financial institutions coexist, and their accessibility differs. The commercial banks are the main players in formal financial markets whereas informal institutions are active in informal financial markets (Aryeetey and Nissanke, 1998; Yadav *et al.* 1992; Soyibo, 1996; Aryeetey, 1994).

2.4.1. Formal financial institutions

Martokoesoemo (1994) defined formal financial institutions as the state-regulated, registered and owned organisations, such as agricultural development banks, state-owned banks, rural banks and commercial banks. Commercial banks have a tendency of demanding higher collateral requirements and deposit in the accounts before they can offer finance to small-scale farmers located in rural areas (Dzadze *et al.* 2012). However, Steel and Andah (2003) indicate that most small-scale farmers lacked deposit accounts with the formal banks, and their available collateral was insufficient to secure a loan from formal credit institutions. Currently, the reality is that informal financial services are of significant importance to women in Africa, greater than formal financial services (Making Finance Work for Africa and Voices, 2014). As reported by Boucher and Guirkingner (2007), the reason why small-scale farmers prefer the informal credit over the formal credit is owing to the lower collateral risk and transaction costs.

2.4.2. Informal financial institutions

Quite the reverse, informal financial institutions are said to be activities of different financial mediators which ranges from merchants, relatives, farmers, money-lenders, friends, shopkeepers, Rotating Savings and Credit Associations (ROSCAs) and traders. Additionally, informal financial institutions borrow its money from friends and

relatives, traders, landlords, private individuals, commission agents and professional moneylenders (Hoff and Stiglitz, 1993; Mohieldin and Wright, 2000). As stated by Birthal and Singh (1993), a simple difference between the informal and formal sectors is that the former does not function by the regulations and rules enforced in the formal financial institutions on the small-scale farmers. Several studies (Kiiza and Pederson, 2001; Braverman and Stiglitz, 1989; Eswaran and Kotwal, 1991; Campero and Kaiser, 2013) have discovered that restricted credit access from formal credit institutions may stimulate the informal banks` development that can serve as a substitute or complement of the formal banks.

2.5. Factors influencing small-scale farmers' access to formal credit

Small-scale farmers` credit access is one of the crucial factors which play a crucial role in affecting the production and income of the small-scale farmers in agricultural production. Furthermore, there are several factors which explain why small-scale farmers` access to credit is sometimes inadequate and constrained and these factors include collateral, distance to financial institutions, credit unworthiness etc. The relationship between each variable and the small-scale farmers` access to credit are discussed below.

2.5.1. Collateral

One technique which the financial institutions use to diminish the risk of losing their cash, because of uncertainty, is through demanding security (Basu, 2006; Hainz and Teksöz, 2006). Collateral decreases the issue of uncertainty because creditors may, in theory, recoup all or a small portion of their money when borrowers default. Furthermore, it helps in reducing the problem of information asymmetries because it is usually easy for moneylenders to value physical assets than to value character. It is difficult for borrowers to use their cherished collateral if they are planning to default on the loan because they will relinquish their collateral (Ibrahim and Aliero, 2012). Thus, the collateral requirement helps financial institutions to get rid of unreliable from reliable borrowers, allowing only genuine candidates who really plan to pay back the loan.

Similarly, the possibility of losing their collateral force borrowers to think carefully before investing in risky endeavours (Basu, 2006). Additionally, a majority of people living in rural areas especially female small-scale farmers are poverty-stricken and they lack possessions that can be properly utilized as the guarantee to secure their loans and this prevents them from accessing credit (Fleisig and De la Pena, 2003). Women rarely have rights to land or access to any other form of collateral, which is a requirement for a loan in many commercial banks.

2.5.2. Distance to financial institutions

Atieno (2001) points out that past credit involvement, income level, assets owned, and distance to credit sources are important factors that influence participation of households in formal credit markets. Additionally, the social and physical proximity between borrowers and lenders simplify the collection of information by the latter about the reputation, creditworthiness, the use of the loan, level of indebtedness and the repayment capacity of the former. This proximity reduces information costs, which are lower than those in formal finance (Lainez, 2014; Thillairajah, 1994).

On the other hand, if the physical distance between lenders and borrowers is lengthy then it becomes difficult for lenders to collect information about creditworthiness, reputation, etc. of the borrowers. There are several studies on access to credit which confirm that small-scale farmers are unlikely to borrow money from formal financial institutions that are far away from their homes (Husseini, 2007; Tang, Guan and Jin, 2010; Yehuala, 2008). Dallimore and Mgitmeti (2003) argued that the high transport costs and long distances prevent people residing in rural areas from accessing formal credit institutions that are situated in urban areas.

2.5.3. Credit unworthiness

One of the main reasons female small-scale farmers are side-lined from formal financial institutions relative to male small-scale farmers is that they are deemed to be credit unworthy (World Bank, 2008). Women, on the supply side, are considered to be credit unworthy because they do not have collaterals or land titles, and this may be as a result of biased inheritance law (Klapper and Parker, 2010; Finnegan, 2015). Normally, women typically experience some difficulties in providing collateral and

personal guarantees and may well have poorer histories of credit (Buvinic and Berger, 1990; Coleman, 2002). Due to asymmetric information, financial institutions typically need evidence of credibility before they can offer credit to borrowers.

Falkingham (2000) established that the credit credibility of women is considered low (World Bank 2008) regardless of international evidence which indicated that women are more reliable in repaying their loans. Generally, the ideal indication of being trustworthy can be a stable flow of cash. On the other hand, small-scale farmers may possibly require loan before getting cash particularly, in situations where planting and harvesting seasons are several months away from each other (Shahriari *et al.* 2009). Provision of collateral to lenders is an alternative way of building trust.

2.5.4. Gender discrimination and interest rate

Shreds of evidence on gender differences with regards to credit access argue that women are more credit constrained than their male counterparts (Narain, 2009b; Malapit, 2012; D'Espallier *et al.* 2009; Morsy and Youssef, 2017; Fletschner, 2009). A study in Nigeria, for example, Saito *et al.* (1994) show that 14 percent of men obtained formal credit as compared to 5 percent of women whereas, in Kenya, the numbers are 14 percent for men and 4 percent for women, respectively. These differences among men and women with regards to credit access prolong inequality and poverty (Staveren, 2001). There is a universal belief that female small-scale farmers are regularly discriminated against in the formal financial institutions especially in EDNs (Morris and Meyer, 1993; Buvinic and Berger, 1990; Mohamed, 2003; Buvinic *et al.* 1979; Brana, 2013; Falkingham, 2000).

Baydas *et al.* (1994b) state that female small-scale farmers are typically the discrimination subject in terms of credit access from the formal financial institutions. This occurs as a result of the weak bargaining power that women have in the households and this causes them to have restricted access to resources that are prerequisite for acquiring credit (Owusu-Danso, n.d.). This is to say that formal financial institutions do not usually take gender into consideration because they are likely to skew towards the male small-scale farmers. These institutions regularly approach and register the male small-scale farmers for the provision of formal credit

(Ellis, 1992). This makes most female small-scale farmers to rely on credit from informal financial institutions as they easily get credit without collateral or where land as a guarantee to access credit is not a critical prerequisite.

Becker (1971) stated that commercial banks primarily discriminate in three ways: through enforcing pre-contractual conditions that are heavy on female farm enterprise than male farm enterprise; through imposing exorbitant interest rates on the loan applications of women; through demanding higher creditworthiness from female farmers than from their male counterparts before giving them loans. Banks offer loan to women at higher interest rates as compared to men, which makes them less likely to use formal financial resources (Finnegan, 2015). Yet cross-country studies revealed that women are unlikely than men to acquire credit from formal credit institutions or are levied exorbitant interest rates contrasted with men (Demirgüç-Kunt *et al.* 2008; Asli and Klapper Leora, 2013; Finnegan, 2015; Johnson, 2004; Muravyev *et al.* 2009). The above-mentioned factors indicate that there is some administrative discrimination in the operations of formal financial institutions and illustrate the challenges that women may face in accessing credit.

Aterido *et al.* (2011) studied the gender gap in financial services using individual-level survey data acquired from FinMark Trust for nine countries in Sub-Saharan Africa (SSA). The findings highlight that a gender gap in employment status, level of income, being the household and education head explains poorer credit use among women farmers. On the contrary, another study found out that there is no evidence of gender discrimination in many Sub-Saharan countries (Aterido *et al.* 2013). However, evidence from developed nations, for example, the United States, the United Kingdom, New Zealand and Canada and from certain EDNs, for instance, Peru and Ecuador reveal that women who apply for credit do not encounter higher rejection rates than men. The findings reveal that differences in the demand for external funding explain the gender differences in the credit use (Baydas *et al.* 1994a; Buvinic and Berger, 1990; Klapper and Parker, 2010; Carter and Shaw, 2006; Coleman, 2000 and 2002).

Particularly, fewer women apply for funding as compared to their male counterparts (Buvinic and Berger, 1990) and they typically ask for a smaller amount of credit

(Baydas *et al.* 1994a; Coleman, 2000). Brana (2013) argues that women are discriminated against with regards to credit supply not due to their gender but less favourable features of their project. It is argued that projects managed by female small-scale farmers are less appealing to commercial lenders for the reason that they are deemed risky and small (Coleman, 2000). Therefore, lenders are more likely to fund bigger projects that are already established, and this tends to favour male small-scale farmers. In Ethiopia, Kedir (2003) discovered that female-headed households were offered more loans by formal financial institutions than their male-headed counterparts. As far as women`s credit access is concerned, Lycette and White (1989) discover little direct evidence indicating that women have restricted credit access.

They further argue that numerous formal banks do not keep records of financial transactions by gender because women are a tiny share of their customers and this makes it challenging for them to cautiously assess the issue. However, on the basis of the limited case studies, these authors stated that women farmers across rural and urban areas encounter difficulties regarding credit that most men farmers do not experience. Even though discrimination is not apparent in the legal framework of banks, evidence suggests that in determining loan approval, banks discriminate based on gender (Asli and Klapper Leora, 2013). Even though there is little explicit evidence of legal discrimination by commercial banks against female borrowers, there is evidence that they discriminate against women in their lending practices (Asli and Klapper Leora, 2013; Finnegan, 2015).

2.5.5. Customs and laws

Customs and traditions create major obstacles for women in drawing nearer, arranging, and tangibly exploring banks that are deemed the domain of men and where women feel they will be underestimated (Burjorjee and Jennings, 2008). Differential treatment under customs and laws might restrain women entering into legal contracts in their own name as well as controlling a property within marriage or opening a bank account (Global Partnership for Financial Inclusion, 2011; World Bank, 2011; Finnegan, 2015). For instance, almost 43% of women in 2014 owned a bank account from formal banks in India as compared to 63% of men (Van Oudheusden *et al.* 2015).

In some instances, banks require a signature of a male family member to open a bank account for women which would allow them to access any financial services or products (Narain, 2009a).

In Pakistan, for example, banks need two male guarantors who are not relatives and will not approve woman guarantors (Finnegan, 2015) and nearly, all women are needed to have their husband`s consent to obtain credit, even in group-lending systems and unmarried women are usually deemed credit unworthy (Safavian and Haq, 2013). Laws may need married women to acquire the endorsement and signature of their husband for all banking and financial transactions (Asli and Klapper Leora, 2013). This point to an ongoing discrimination and blockages faced by women on the continent in accessing credit and other financial services and this might hinder them to participate in the formal economy. Adverse credit histories of the husbands may also affect women as they could be denied future credit on the basis of the husband`s credit history (Naidoo and Hilton, 2006; Blanchard *et al.* 2005).

2.5.6. Perception

Women, on the demand side, restrict themselves from gaining access to credit. As a result of the above-mentioned factors, women often display, intentionally or unintentionally, a lesser credit demand than men (Johnson, 2004). Mostly, female farmers have a tendency to apply for less bank credit than their male partners, especially because of fear of denial and they also encounter a higher rejection rate as opposed to male small-scale farmers when applying. Sachs (2014) and Finnegan (2015) demonstrate that female farmers might be disheartened to apply for a loan as a result of the expectation of dismissal. Consequently, women might be reluctant to acquire credit from formal banks as a result of their own perceptions that women may experience some difficulties in accessing credit.

It is argued by several studies that, in many cases, the perception that women encounter many difficulties in accessing loan, may itself disclose their lower proclivity to utilise outside credit sources or their inclination to apply for smaller credit amounts (Cole and Mehran, 2011; Coleman, 2000). If women have access to and control over small credits than men, they might be vulnerable to abuse (World Bank, 2008).

Coleman and Robb (2009) demonstrated that females are probably turned down for credit contrasted with men. Confirmation from the United States demonstrates that females are probably disheartened from applying for credits inspired by fear of dismissal, albeit they are not any more prone to be denied when they do apply (Cole and Mehran, 2011).

2.5.7. Risk aversion

In Vietnam, Fletschner *et al.* (2010) conducted a study comparing the risk attitude and willingness to compete of wives and husbands in 500 couples using controlled experiments. The finding of the study revealed that women are inclined to be risk averse as contrasted with men and that, compared with men, women are more averse to contend regardless of the fact that they are so prone to succeed. In other words, the results indicate that women might be more hesitant to take credit loan, embrace modern technology, or take part in economic activities that offer higher anticipated revenues to avoid situations which need them to bear too much risk or be more aggressive (Browne, 2006; Croson and Gneezy, 2009; Fletschner *et al.* 2010).

Watson and Robinson (2003) express that their risk-averseness drives them to apply for littler credits for the reason that bigger credit may make them lose the guarantee they possess. In other words, women, especially in developing countries, tend to be more careful than men regarding credit amount and risk they are prepared to take. Similarly, producers who are reluctant to contend might end up in economic activities which consistently bring down revenues. Concerns are voiced that credit access will always be discriminating at the beginning, for instances, individuals who are daring utilize the services first and therefore can cause disparity in the short run (Giné and Townsend, 2004).

2.5.8. Personal funds

It is contended that women prefer using farm earning, personal funds, family loans and credit cards to fund their farms instead of running into debt (Coleman and Robb, 2009; Treichel and Scott, 2006). Additionally, gender differences in collateral needed, the interest rate charged, and risk-aversion is one of the reasons why women prefer financing themselves than borrowing. Van Auken (1999) confirms that women are less

inclined to apply for credit and will probably use private possessions as a guarantee or to fund their farms. In Kenya, women prefer using micro-financing and merry-go-round funding contrasted with obtaining credit from formal credit institutions because this is considered to be safe (Adede, 2007).

2.5.9. Extension services

Studies (Hussein, 2007; Yehuala, 2008; Adeola and Ayoade, 2009) indicate that extension contact significantly influence the capabilities of small-scale farmers to adopt technology and to make a decision. Worldwide (2010) indicated that even though most of the small-scale farmers in the developing countries are women, a large share of the extension agents who provide those services and training are men. In fact, the people who are doing most of the farming are often denied access to extension services. Staudt (1982) also revealed that extension agencies that have more men on staff, give preference to male small-scale farmers, at times even to women with wealth and large farms. Moreover, extension agents usually direct their extension services to small-scale farmers who are better off and more likely to adopt modern technologies.

For instance, extension agents may turn a blind eye to women since they are less inclined to access resources (Anaglo *et al.* 2014; Food and Agriculture Organization, 2010; Meinzen-Dick *et al.* 2011). There are quite a few reasons extension services are not reaching women. Firstly, in many communities and cultures, contact between men and women is limited and hence women are unable to attend trainings with men. In those cultural settings wherein, norms confine mobility of women and their communications with men then their ability to attend financial trainings and to access valuable information regarding credit is compromised (Gwivaha, 2015; Fletschner and Kenney, 2014; Worldwide, 2010). Subsequently, women`s limitations on societal interactions with the outside world, particularly over gender lines, might restrict their credit access.

Secondly, male extension officers have a tendency of approaching male small-scale farmers more than female small-scale farmers under the false impression that extension services will ultimately stream down from the male family heads to all family

members (Food and Agriculture Organization, 2010). Women's days are filled with time-consuming activities on top of their demanding farming duties and this makes attending trainings difficult (Worldwide, 2010). In supporting the same idea, women in LDCs are exploited and overburdened and they do not have enough time to search for information even if education programmes are within their reach (Park, 2007). There are small numbers of women involved in the formal agricultural education who can become researchers or extension workers themselves (Worldwide, 2010).

2.5.10. Education level and literacy

Owuor (2009) noticed that, in Kenya, education level and literacy significantly influence small-scale farmers' capacity to access information concerning credit. Karam (2014) cited illiteracy as an important barrier for underprivileged women because this makes them not to use limited rights they may have legally, such as the right to own land and so forth. It is contended that women possess lower financial incomes and literacy levels as compared to their male counterparts and they might be incapable of perusing pesticides information or buy pesticide (Naidoo *et al.* 2008). In fact, without basic education and literacy women may be unable to read simple instructions and this has an adverse impact on agricultural productivity and access to credit from financial institutions.

Across the developing countries, worldwide (2010) noticed that literacy rates among women seem to lag significantly behind men. In other words, when female small-scale farmers are unable to read and understand instructions on how to use fertilizers, technologies, apply for credit or even read a weather report, then their crops will suffer and cause their families to live in abject poverty. This hindrance basically makes any information transfer about credit from the extension agents to women difficult. For instance, female small-scale farmers face quite bigger glitches in filling out complex loan applications because they possess lower financial literacy rates, and this makes it difficult for them to explore the financial market (Buvinic and Berger, 1990; Lusardi and Tufano, 2015). Women are extremely affected by language barriers and illiteracy (Fletschner and Mesbah, 2011).

Ngimwa *et al.* (1997) shows that female farmers' low literacy levels and lack of exposure to other languages, particularly connected to male family members, hinders the capability of women to benefit from information that is presented in languages apart from those they speak at home. In supporting the view, Ochieng (1999) emphasizes that the low literacy rate amongst females, not to mention the linguistic obstacle, hampers them from procuring the information required to enhance their agrarian happenings. According to an experiment conducted in Indonesia and India by Cole, Sampson and Zia (2009), financial literacy is one of the factors which predict credit demand.

In other words, the problem of credit access is worsened by that most borrowers have had limited education. Borrowers need to be equipped with reasonable literacy level to comprehend loan conditions and to sign on loan documents. Hence, there is a need to promote primary education in order to increase access to credit by borrowers, especially women (Selvavinayagam, 1995). However, several studies in Kenya contend that if women received similar agricultural production inputs and had similar education level as men, their crops would increase by more than 20 percent (Saito *et al.* 1994; Demirgüç-Kunt *et al.* 2008). Furthermore, women usually have poorer education levels as opposed to men, which is likely to restrain them from actively partaking in extension training that make use of more printed materials (MacGregor, 2017).

2.5.11. Land ownership

Razavi (2012) observed a colossal gap that needs to be bridged between the female small-scale farmers and male counterparts with regards to access to land and credit. It is further stated that gender differences prolong whether land access is measured as ownership or as the capacity to use land. Fletschner and Kenney (2014) argue that customary rules and legal regulations continually restraint women's control over and access to possessions that can be used and acknowledged as security for acquiring credit, for example, property, land and so forth. Furthermore, women are frequently deprived of their land title and albeit when they legally own the land, they are unlikely to have control over land as opposed to men.

Steinzor (2003) highlights that, worldwide, women legally own roughly 2 per cent of land and are regularly deprived of the privilege to acquire possessions. Evidence from various nations indicates that females are discriminated with regards to land allocation by the state (Shahriari *et al.* 2009). Firstly, a land allocation is usually based on how much influence one has on the society and how well-connected one is to people in high places. Due to the fact that women are not socially associated with people in high places, clientelism is likely to favour men. Falkingham (2000) demonstrated that perceptions and traditional role models win because women are regarded as unequipped for taking care of property.

2.5.12. Biased inheritance rules

Agarwal (2003) shows that biased inheritance rules in traditional societies have a tendency of favouring sons as opposed to daughters and wives. Particularly, in patrilocal cultures parents tend to hand down their land to the son for the reason that after marriage the daughter leaves her family to live with the family of her husband (Grogan, 2007). Shahriari *et al.* (2009) illustrated that inherited land is given to women in less than one out of seven cases. This is one of the blockades which constrains the women from acquiring land which is usually utilized to secure their credit. If inheritance becomes the only mode of transferring the land from one individual to the other, then the biasedness in the allocation of land will remain unaltered.

The existing land reform in South Africa is incomplete and does not specifically address gender issues. Legally, men and women are dealt with in the same way, nevertheless, women's familiarity with their privileges is very low (United Nations Development Programme, 2005). Steinzor (2003) and Richardson (2004) argue that even in nations where the land rights of women are safeguarded by laws, these laws are regulated and implemented loosely.

2.6. Empirical evidence on the determinants of credit access

In Vietnam, Quoc Duy (2011) conducted a study which observed that credit access was positively linked to a bigger family with quite more dependents. The study further revealed that households which possess landholding had a higher chance of applying for credit. Likewise, large families which have more dependents and big landholding

have a higher likelihood of accessing credit as compared to those with small families. Additionally, the study points out that personal characteristics, for instance, marital status, education level and participation in community work were key factors. This means that household heads which are highly educated and engaged in community work tend to borrow greater amounts of money.

Binomial logit regression analysis was employed by Ololade and Olagunju (2013), in Oyo state Nigeria, to examine the determining factors of credit access by farmers. The findings discovered that factors that significantly affected access to credit were guarantor, marital status, high interest rate and gender. The findings revealed that being unmarried decreases the likelihood of acquiring credit by 86.3%. It is further revealed that being a female farmer decreases the likelihood of accessing credit by 71.3%. Increasing an interest rate by one unit reduces the likelihood of accessing credit and farmers` credit access is positively influenced by guarantor availability.

Sebopetji and Belete (2009) conducted a study which investigated the factors that affect the small-scale farmer`s decision to acquire credit in the Greater Letaba Local Municipality of Limpopo province of South Africa. The data was randomly collected from 73 small-scale farmers by means of a structured questionnaire. Using the binary probit model, the empirical results found out that the small-scale farmer`s decision to obtain credit is significantly and positively influenced by their marital status, farming experience and gender whereas negatively influenced by their formal education, age, membership and farm size of a farmer to an association.

Using both binary probit model and heckman selection, Tetteh Anang *et al.* (2015) investigated factors influencing smallholder farmers` access to agricultural microcredit in Northern Ghana. The data was collected from 300 smallholder rice farmers in Northern Ghana by means of a semi-structured questionnaire. The findings indicated that factors, such as gender, farm capital, household income, improved technology adoption, extension contact, awareness of lending institutions and the location of the farm influences access to agricultural microcredit. The study further found out that farm capital, household size, enhanced technology adoption, gender and cattle ownership were important factors determining a loan size.

Ibrahim and Aliero (2012) utilized a probit modelling approach to analyse factors that influence farmers' formal credit access in the rural area of Nigeria. The primary data used was collected from the rural areas of Katsina State. The findings revealed that the collateral, marital status, income level and educational attainment significantly and positively influence farmers' formal credit access. In contrast, transaction costs and interest rates significantly and negatively influence farmers' formal credit access. Dube *et al.* (2015), using both descriptive statistics and logistic regression model, investigated the determinants of formal credit access by smallholder tobacco farmers in Makoni District, Zimbabwe.

The findings revealed that extension contact, ownership of cultivated land and attitude of farmers towards risk of borrowing significantly and positively influence formal credit access in Makoni district of Zimbabwe. On the other hand, other socio-economic factors, such as area cultivated, gender, experience in credit use, sex of the smallholder tobacco farmer, livestock ownership, family labour and age do not significantly affect formal credit access by smallholder tobacco farmers in the study area.

Yehuala (2008) employed a logit model to examine the determinants of smallholder farmer's formal credit access in Ethiopia. The findings indicated that the likelihood of obtaining formal credit was positively and significantly influenced by cultivated land size, experience in credit usage from formal institutions, membership of households in multipurpose cooperatives and partaking in extension programs. Similarly, the findings further highlighted that women status and diverse wealth groups influence access to informal and formal credit institutions.

Mohamed (2003) carried out a study in Zanzibar which analysed smallholder farmers and artisanal fishermen's formal and quasi-formal credit access. T-test and logistic regression model were employed to compare non-borrowers and borrowers and to determine factors influencing the capacity of smallholder farmers and artisanal fisherman to acquire credit from formal and quasi-formal financial institutions. The findings of the study revealed that the degree of awareness on credit availability,

education, age, level of income and gender are factors which significantly influence artisanal fishermen and smallholder farmers` credit access.

Lensink *et al.* (2007) in determining the farming households` access to formal credit in Mekong Delta found out that land size was a significant variable. This variable plays a key role in accounting for formal credit access. As a result, farmers who have big land sizes tend to acquire a large amount of credit. On the contrary, Musahara (2006) shown that majority of farmers in Rwanda are in need of registered title deeds. Nearly 80 per cent of households that occupied Rwanda count on agriculture. The population density of more than 380 people that Rwanda have is evidence that land might not be the main factor in explaining credit access but there is a concern of insecure land rights.

Tang *et al.* (2010), in China, investigated formal and informal credit markets and rural credit demand using both binary choice probit model and multinomial probit model. The findings of the study revealed that education level, household size and land size increase the likelihood of acquiring credit from formal credit markets. However, the influence of these variables differs largely depending on the credit markets. The study further revealed that household with large land size and more non-farm income had higher chances of accessing credit from formal and informal finance institutions. The coexistence of formal and informal credit market in Rwanda and China is similar but they differ in their productive capabilities.

Samuel *et al.* (2015) investigated the determinants of agricultural credit access for small and marginal farmers` in Dharwad district, Karnataka, India. The family size, irrigation facilities, gender, income level, education level, age, occupation, landholdings and marital status are seen as factors that influence agricultural credit access by small and marginal farmers. Out of these factors gender, irrigation facilities, educational level, income level and landholdings were important variables which determine small and marginal farmers` agricultural credit access from the banks. The study recommended that the policy makers and the government should reform schemes in favour of small and marginal farmers.

Using descriptive statistics and logit model regression Jeiyol *et al.* (2013), conducted a study on gender analysis of credit access by rural small-scale farmers in Benue state Nigeria. The study used a structured questionnaire to collect data from 60 male and 60 female crop farmers who were randomly sampled. The findings of the study discovered that cost of fertilizer, household expenditure, farm size, farm income and cost of hired labour are important factors that influence credit access amongst female and male farmers. The study suggested policy makers should develop policies that are gender neutral in enhancing credit access among farmers in rural areas.

Odoh *et al.* (2009) assessed the gender access to credit by smallholder cassava farmers in Afikpo North Local Government Area (L.G.A.) of Ebonyi State, Nigeria. Questionnaires and interview schedules were used to collect data and the data was analysed using both descriptive statistics and ordinary least square regression analysis. The findings of the study revealed that age, marital status and gender were statistically significant at 10% and 5% as having a strong effect on smallholder cassava farmers` credit access. Additionally, it was observed that most of the farmers (male 35% and female 25%) accessed credit through informal financial institutions, such as cooperative societies. Yet again, male farmers have been known to receive more credit relative to female farmers because of their capability to provide collateral. Furthermore, the study indicated that a high-interest rate, delay in accessing credit, lack of collateral, and failure of the farmers to get guarantees for the loan are the most crucial factors which constrain smallholder cassava farmers from accessing credit.

Abdalla and Ebiadalla (2012) discovered that collateral ownership, experience in credit usage, family size, and involvement in extension happenings influence small-scale farmers` access to formal credit institutions. It is further indicated that distance travelled to banks by farmer, age and farm size influence credit access. Muhammad *et al.* (2013) employed a data collected from 80 farmers who got involved in formal agricultural credit to study the impact of socio-economic characteristics of farmers on access to agricultural credit in Pakistan. The data was collected by means of a structured questionnaire and analysed using ordered logit model. Findings of the study revealed that farm size, farm status, education level, and marital status mostly influenced credit amount that the farmer can borrow.

Hananu *et al.* (2015) investigated factors influencing the demand of households for agricultural credit in Northern Ghana. A total sample size of 2,330 farm household was selected and used in the study. The results of the study suggested that factors, such as education, age, the source of credit and group membership are positive and significant. Atieno (2001), in Kenya, conducted a study on the role of formal and informal institutions` lending policies in influencing small-scale enterprises` credit access. The findings revealed that distance to banks, assets owned, and past credit involvement are significant factors that accounted for enterprises` participation in formal financial markets.

Oyedele and Akintola (2012) investigated the determinants of access to credit in Nigerian agriculture. The data collected was analysed using both the descriptive statistics and probit regression model. A sample size of 600 farmers was selected using a multi-stage sampling technique. The findings of the study revealed that 53.3% of the farmers accessed National Special Programme for Food Security (NSPFS) whereas 46.7% of the farmers did not access NSPFS. The result further revealed that farmers` farm location, age, landholding size, access to extension services, access to other credit, membership of registered farming group and financial contribution to a group are the most crucial variables that significantly influenced access of households to NSPFS credit.

2.7. Summary of the literature

From the literature review, researchers assessed various determinants of credit access of small-scale farmers, they acknowledge that agricultural industry has been marginalized owing to numerous factors, such as collateral, land ownership and physical distance to financial institutions among others. Within the agrarian sector in South Africa, if access to formal credit is to be improved, formal financial institutions should take gender into consideration. These institutions should see to it that female and male small-scale farmers are treated equally, and no small-scale farmers should be denied access to credit or land based on their gender. Though several studies have been carried out across Africa continent on credit access, there is a shortage of literature on gender analysis of formal credit access specifically amongst small-scale

farmers. This severe gender gap ought to be closed if low credit problem amongst small-scale farmers is to be resolved.

CHAPTER THREE: METHODOLOGY AND ANALYTICAL PROCEDURES

3.1. Introduction

This chapter focuses on the description of the study area where the research was carried out, research design, methods employed to identify the respondents and to collect data, ethical obligations, analytical techniques that were used to analyse the data collected as well as the definition of the variables.

3.2. Study area

The study was conducted in the Greater Letaba Municipality (GLM) of the Limpopo province (see figure 3.1 map of Greater Letaba Municipality). The GLM is a Category B municipality located in the Mopani District of the Limpopo Province. It is the smallest of the five municipalities in the district (National Government of South Africa, 2012). The gates to the municipal area are Modjadjiskloof which is previously known as the Duiwelskloof in the south, Mamaila Kolobetona in the north, Sekgopo in the west and Makgakgapatse in the east.



Figure 3. 1: Map of Greater Letaba Municipality.

(Source: <https://nationalgovernment.co.za>; 2012)

The municipality consists of approximately 130 rural villages and diverse topography, population densities, sparse vegetation in the north as well as the prolific vegetation in the south characterize the area. The GLM is situated in the town of Modjadjiskloof. The main economic activities in the area revolve around these sectors namely: wholesale and retail trade, general government services, transport and communication, forestry and fishing, finance and business services, catering and accommodation, agriculture, manufacturing, community, electricity and water, social and personal services. The GLM was selected as the study area because it is the leading area in terms of agriculture, forestry, tourism and small-scale mining in the province. It is the largest tomatoes producer in the southern hemisphere through the ZZ2 tomato estate (Mopani, 2006)

3.3. Research design

As stated by Mouton and Babbie (2001), a research design is a plan or blueprint for conducting the research. The research design is a detailed plan according to which research is undertaken. It can also be referred as the framework adopted to collect and analyse data so that useful information can be withdrawn from it. The research used the exploratory design. This study made use of exploratory design because it is often useful in establishing an understanding of how best to proceed in studying an issue or what methodology would effectively apply to gathering information about the issue. One of its goals is to ensure the generation of new ideas and assumptions.

3.4. Sampling method

A stratified random sampling was used for selecting a representative sample of small-scale farmers from the GLM. Stratified random sampling is a probability sampling technique whereby the entire population is firstly divided into strata (subgroups) (Acharya *et al.* 2013; Ackoff, 1953). Subgroups are a natural set of items. Subgroups, in this case, are based on the gender (female or male) of small-scale farmers. Secondly, a simple random sample is taken from each subgroup and the collective results from each stratum (subgroup) constituted the representative sample of size of small-scale farmers.

The total sample frame of 1400 small-scale farmer was obtained from the database of the GLM and the one-tenth rule of thumb was used in determining the sample size. The first step involves dividing total population of 1400 small-scale farmers into two subgroups which is 700 female farmers and 700 male farmers. In the second step, 70 male farmers and 70 female farmers were randomly selected from each abovementioned subgroup. In all, 70 females and 70 male small-scale farmers who were taken from each stratum gave a total sample size of 140 small-scale farmers. A stratified random sampling was used for selecting a sample size of 140 (composed of 70 females and 70 males) small-scale farmers from a sample frame of 1400 small-scale farmer in the GLM. The study used the stratified random sampling technique because the population is heterogeneous and there is a great deal of variation within a population (Alvi, 2016).

The advantage of the stratified random sampling is that it ensures that every stratum in the population is accurately and adequately represented (Ackoff, 1953; Acharya *et al.* 2013). The main purpose of this sampling technique is to select a representative sample and to allow subgroup analyses. According to Malhotra and Birks (2007), a stratified random sampling ensures that the researcher have a higher statistical precision compared to both cluster and simple random sampling without increasing the cost. Because of its high statistical precision, it also implies that it requires a small sample size which can save a lot of time, money and effort of the researchers. Stratified random sampling is useful in helping the researcher to highlight a specific subgroup within the population. Because of this technique the researcher can observe the existing relationships between two or more subgroups (Acharya *et al.* 2013; Alvi, 2016).

3.5. Data collection

The primary data was collected from small-scale farmers in the GLM through a field survey. The instrument employed to collect information was face-to-face interviews using structured questionnaires. The data collection process was carried out during the month of August. A questionnaire is a form containing a set of predetermined questions (Cooper *et al.* 2006). The structured questionnaire was designed to elicit data on demographic data and socio-economic characteristics of the small-scale

farmer that were assumed to influence the access to formal credit by both male and female small-scale farmers. Questionnaires were administered to both male and female small-scale farmers at meetings or gatherings. Gender, formal education, age in years, marital status, farm size in hectares, farm income in Rands per annum, farming experience in years and extension services were the characteristics included on the questionnaire.

3.6. Data analysis

The primary data collected was captured and coded on Statistical Package for the Social Sciences (SPSS) version 25 and Statistics and Data (STATA) version 12.1 and analysed using descriptive statistics, Principal Component Analysis and probit model. Descriptive statistics was used to identify and describe the socio-economic characteristics of female and male small-scale farmers. The Principal Component Analysis (PCA) on the SPSS was performed to determine the perceptions of female small-scale farmers towards the credit system. Furthermore, probit regression analysis was performed on the STATA to determine factors that influence access to formal credit by both male and female small-scale farmers.

3.7. Ethical consideration

The study involved human subjects (small-scale farmers) which required ethical clearance. The study adhered to the ethical guidelines and regulations of the University of Limpopo.

3.7.1. Permission

The ethical clearance certificate or permission to carry out the study was obtained from Turloop Research Ethics Committee (TREC) before commencing with the study.

3.7.2. Informed consent

The small-scale farmers were required to sign a consent form to show that they agreed to participate in the study. The researcher informed the small-scale farmers that their participation is voluntary and that they are free to withdraw from participating at any point without penalty or the need to justify their decision.

3.7.3. Confidentiality and anonymity

In this study confidentiality and anonymity of the small-scale farmers was taken into consideration. In other words, the information and answers they provided was treated with the utmost confidentiality. The small-scale farmers' real names were not mentioned in the study and the provided information was used only for research purposes. The researcher fully informed the small-scale farmers about the topic, aim and objectives of the study before they agreed to participate in the study.

3.7.4. Protection from harm

The researcher protected the identities of the small-scale farmers and their privacy was also protected through anonymity. The study was not harmful to the well-being of the people.

3.8. Analytical techniques

3.8.1. Description of the models

The study used three analytical techniques namely; descriptive statistics, probit model and Principal Component Analysis (PCA) to analyse the data. Descriptive statistics was employed in identifying and describing the socio-economic characteristics of female and male small-scale farmers. Furthermore, probit model was employed to analyse and compare factors influencing access to formal credit by both female and male small-scale farmers because it is efficient in estimating dichotomous variables. The PCA was employed to determine the perceptions of female small-scale farmers towards the credit system. A set of questions were used and transferred to a likert scale. After all, the likert scaled questions were transferred to the PCA to determine the perceptions of female small-scale farmers towards the credit system.

The PCA is a variable reduction technique which is utilized when you have acquired measures for a set of observed variables and seek to arrive at few variables that will capture most of the variation in the observed variables (O'Rourke *et al.* 2013). Furthermore, the PCA is useful especially when obtained data for many variables that have some correlation or redundancy. Due to the redundancy, this technique reduces the observed variables into a lesser amount of variables known as principal components which capture most of the variance in the observed variables. The PCA

was used to determine the perceptions of female small-scale farmers towards the credit system because Asli and Klapper Leora (2013) and many others claim that more than one billion female small-scale farmers continue to be outside the formal credit institutions. They further claim that these institutions do not usually take gender into account because they are likely to skew towards male small-scale farmers. This study employed the PCA to determine how the female small-scale farmers view or perceive these institutions.

The binary probit model was used because access of formal credit by small-scale farmers is a dichotomous variable, which takes the value of 1 if a small-scale farmer accessed formal credit or takes the value of 0 if a small-scale farmer did not access formal credit. As stated by 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 variables is constant across different predicted values of the dependent variable. The model assumes we observe the values of 1 and 0 for variable Y . However, there is an unobserved latent continuous variable Y^* that determines the value of Y . The probit model also includes realistic probabilities and believable error term distribution (Nagler, 1994).

This model was selected because it is efficient in analysing the relationship between categorical variable and set of both categorical and continuous independent variables (Uchezuba *et al.* 2009). The study included all the small-scale farmers who accessed credit and those who did not access credit because selecting small-scale farmers who have access to credit while neglecting those who do not have access to credit could result in the problem of selectivity bias and this may also result in the loss of valued information and omission of other important variables. Therefore, the probit model is an excellent choice for this study because it is best suited to overcome the problem of selectivity biased.

The assumption is that Y^* can be specified as follows:

$$Y_i^* = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_n x_{ni} + \mu_i \dots \dots \dots (1)$$

And that:

$$Y_i = 1 \text{ if } Y^* > 0$$

$$Y_i = 0 \text{ Otherwise}$$

Where: Y_i represents a dependent variable, β_0 represents a constant, $\beta_1, \beta_2, \dots, \beta_n$ represents the regression coefficients, x_1, x_2, \dots, x_n represents the independent variables that are considered in this study, and μ_i represents a random disturbance term.

Model specification

The specified probit model that was used to analyse small-scale farmers' access to formal credit can be as follows:

$$Y_i(ACRDT) = \beta_0 + \beta_1 EXP + \beta_2 EDUL + \beta_3 MS + \beta_4 EXTS + \beta_5 COL + \beta_6 AG + \beta_7 FI + \beta_8 FS + \beta_9 DIS + \beta_{10} GEN + \beta_{11} LO + \beta_{12} HS + \mu_i \dots \dots \dots (2)$$

N.B.: equation 1 is estimated for both female and male small-scale farmers. All the independent variables that are found on table 3.1 were finally incorporated in the probit model.

3.9. Definition of variables

3.9.1. Access to formal credit

As shown in table 3.1, access to formal credit is the dependent variable for the binary probit model and it is dichotomous in nature. This is to distinguish between small-scale farmers who have access to formal credit and those who do not have access to formal credit. This dependent variable is a dummy variable which assumes the value of one if a small-scale farmer has access to formal credit or the value of zero if a small-scale farmer does not have access to credit.

3.9.2. Farm experience

As indicated in table 3.1, experience is a continuous variable and it is referred as the number of years a small-scale farmer has in farming. It is expected that an increase in the small-scale farmers' experience in farming could likely increase their probability of acquiring formal credit from formal financial institutions. This implies that a small-scale farmer with many years of experience in farming usually understand more about credit and have adequate information about credit. Small-scale farmer's experience played a key role in assessing credit (Yehuala, 2008). Therefore, a small-scale farmer who has more farm experience would have a higher likelihood of accessing formal credit in the GLM.

3.9.3. Education level

As shown in table 3.1, education level of small-scale farmer is a dummy variable and it was categorized into formal education and informal education. It is hypothesized that the probability of the small-scale farmers to access formal credit from formal financial institutions would likely to increase if they had formal education. The implication is that small-scale farmers with formal education are likely to acquire credit because they know the ins and outs of the formal credit markets. Owuor (2009) noticed that, in Kenya, education level and literacy significantly influence small-scale farmers' capacity to access information concerning credit.

3.9.4. Marital status

Marital status is a dummy variable which takes the value of one if a small-scale farmer is married and the value of zero otherwise. Based on the predicted expectation on table 3.1, the likelihood of the small-scale farmers' access to formal credit from formal financial institutions would likely increase if the farmer is married. Some of the financial institutions requires an individual to acquire the endorsement and signature of their spouse for all banking and financial transactions. Muhammad *et al.* (2013) investigated the impact of socio-economic characteristics of farmers on access to agricultural credit in Pakistan and found out that marital status mostly influenced credit amount that the farmer can borrow.

3.9.5. Extension services

As displayed on table 3.1, extension service is a dummy variable which takes the value of one if a small-scale farmer receives extension services and the value of zero if a small-scale farmer does not receive extension services for extension officer. It is assumed that the small-scale farmer is likely to increase his or her probability of accessing formal credit from formal financial institutions if the farmer receives extension services from extension officers. This implies that farmers who receives extension services have high chances of getting credit due to the pool of knowledge they receive, and this makes them to make informed decision when access credit from financial institutions. Hussein (2007) and Yehuala (2008) indicate that extension contact significantly influence the capabilities of small-scale farmers to adopt technology and to decide.

3.9.6. Collateral

Collateral is a dummy variable and it takes the value of one if the small-scale farmer has collateral and zero otherwise. On the basis of the predicted expectation on table 3.1, the small-scale farmer is likely to increase or decrease his or her likelihood of acquiring formal credit from formal financial institutions depending on the possession of collateral. Ibrahim and Aliero (2012) utilized a probit modelling approach to analyse factors that influence farmers` formal credit access in the rural area of Nigeria and found out that collateral significantly and positively influence farmers` formal credit access. This means that if a farmer possess collateral have a higher chance of accessing formal credit from formal financial institutions.

3.9.7. Age

Table 3.1 indicates that age is a continuous variable which is defined as the age of the small-scale famer at the time of interview measured in years. It is expected that an increase in the age of the small-scale farmers is likely to increase the probability of the farmer to access formal credit from formal financial institutions. This means that older small-scale farmers have a propensity to access more formal credit because age is usually associated with experience. This means that they have lived long enough to accumulate more knowledge, understanding and experience with the financial institutions. Dube *et al.* (2015), in Zimbabwe, investigated the determinants that affects

smallholder tobacco farmers` formal credit access and found out that older farmers accessed more formal credit contrasted with the younger ones.

3.9.8. Farm-income

As shown on table 3.1, farm-income is a continuous variable and it is referred as the annual amount of farm-income of the small-scale farmers measured in Rands. It hypothesized that an increase in the farm-income of the small-scale farmers would likely to increase their probability to access formal credit from formal financial institutions. Most financial institutions require a small-scale farmer to provide a proof which indicates that he or she has a stable farm income. Having a farm-income as a source of income gives the small-scale farmer an added advantage in acquiring formal credit because formal financial institutions are assured that they have a stable client who is less likely to default.

3.9.9. Farm size

As displayed on table 3.1, farm size is a continuous variable which is usually defined as the size of the arable land of the small-scale farmer measured in hectares. It expected that an increase in the farm size of the small-scale farmer could likely to increase the small-scale farmers` probability of accessing formal credit from formal financial institutions. This means that larger farm size affects the amount of credit required by small-scale farmers to purchase production inputs, hence small-scale farmers are compelled to increase their demand for credit (Sial and Carter, 1996). In other words, the amount of credit small-scale farmers uses per hectare increases as the size of arable land increases (Amjad and Hasnu, 2007). Large farm size causes the small-scale farmers to demand more credit as compared to small farm size.

3.9.10. Distance to the financial institutions

Table 3.1 shows that distance to the financial institutions is a continuous variable which is referred as the distance travelled by small-scale farmer travel to the banks and it is measured in kilometres. It is assumed that an increase in the distance to the financial institutions by small-scale farmers would likely to decrease the probability of the farmer to obtain formal credit from formal financial institutions. Several studies on access to credit confirm that small-scale farmers are unlikely to borrow money from

formal financial institutions that are far away from their homes (Hussein, 2007; Tang *et al.* 2010; Yehuala, 2008). Dallimore and Mgimeti (2003) argued that the high transport cost and long distances prevent people residing in rural areas from accessing formal credit institutions that are situated in urban areas. The small-scale farmers who are closer to financial institutions are inclined to have a higher chance of acquiring formal credit.

3.9.11. Gender

Gender is a dummy variable that assumes the value of one if the small-scale farmer is male and zero otherwise. Based on the predicted expectation on table 3.1, the small-scale farmers' probability to access formal credit from formal financial institutions would likely to increase if the farmer is a male. This is to say that formal financial institutions do not usually take gender into consideration because they are likely to skew towards the male small-scale farmers. These institutions regularly approach and register the male small-scale farmers for the provision of formal credit (Ellis, 1992). The finding from the study indicates that most of the recipients of credit are male. There is a belief that female small-scale farmers are regularly discriminated against in the formal financial institutions especially in EDNs (Mohamed, 2003; Brana, 2013; Falkingham, 2000).

3.9.12. Land ownership

According to table 3.1, land ownership is a dummy variable which assumes the value of one if a small-scale farmer own land or the value of zero if a small-scale farmer does not own land. It is expected that the probability of small-scale farmers to access formal credit from formal financial institutions would likely to increase if the farmer owns land. This implies that owning land afford the farmer an opportunity to obtain credit because, in most cases, land is usually used as collateral.

3.9.13. Household size

As displayed on table 3.1, the household size of the farmer is a continuous variable and it is defined as the number of people who live under the same roof. It expected that an increase in the household size of the small-scale farmer would likely to increase their probability to access formal credit form formal financial institutions.

This implies that an increase in household size will increase the chances of accessing formal credit because some of the family members might engage some income generating activities. Tang *et al.* (2010) investigated the formal and informal credit markets and rural credit demand using both binary choice probit model and multinomial probit model. The findings of the study revealed that household size increase the likelihood of acquiring credit from formal credit markets.

Table 3. 1: Definition of variables.

List of variables	Description of variables	Units of measurement	A priori expectation
Dependent variable			
Access to formal credit (ACRDT) (Y _i)	1 if a farmer (male or female) accessed credit, 0 otherwise	Dummy	
Independent variables			
Experience (EXP)	Experience of farmers in farming	Number of years	+
Education level (EDUL)	1 if is formal, 0 otherwise.	Dummy	+
Marital status (MS)	1 if married, 0 otherwise.	Dummy	+
Extension services (EXTS)	1 if farmer receives extension services, 0 otherwise	Dummy	+
Collateral (COL)	1 if a farmer has a collateral, 0 otherwise	Dummy	-or+
Age (AG)	Age of the farmer	Years	+
Farm-income (FINC)	Farm-income per annum	Rands	+
Farm size (FS)	Size of arable land	Hectares	+
Distance (DIS)	Distance to the financial institutions	Kilometres	-
Gender (GEN)	1 if is male, 0 otherwise	Dummy	+
Land ownership (LO)	1 if a farmer own land, 0 otherwise	Dummy	+
Household size (HS)	Household size of the farmer	Numbers	+

(Source: Field survey; 2018)

3.10. Summary

The sampling technique used to select respondents in this chapter ensured that there is higher precision while reducing the costs and yielded satisfactory results on time. The methods that were used in the data collection process ensured that the researcher get the information required from the respondents.

CHAPTER FOUR: RESULTS

4.1. Introduction

The main focus of this chapter was to presents the descriptive analysis results and the empirical results from the two analytical tools, namely, Principal Component Analysis (PCA) and probit analysis. The chapter precisely describes the data type employed in the study as well as providing a summary of variables that were observed and their measures. The results were tabulated and interpreted individually. The results of the probit analysis, Principal Component Analysis and their interpretation were discussed. The results of the PCA would consist of Kaise-Meyer-Olkin measure (KMO) test and Bartlett`s test, communalities, total variance explained and rotation component matrix. Additionally, the results of the probit analysis would include the probit regression coefficients of factors that influence access to formal credit by both female and male small-scale farmers in the Greater Letaba Municipality (GLM).

4.2. Results from descriptive statistics

As shown in table 4.1, a total of 140 small-scale farmers (70 males and 70 females) were sampled in the study and out of 140 small-scale farmers, 59 (42.1%) accessed formal credit and 81 (57.6%) did not access formal credit.

Table 4. 1: Proportion of small-scale farmers who accessed and did not access credit.

Access to credit	Have access to credit	Do not have access to credit	Total
Frequency	59	81	140
Percentage (%)	42.1	57.9	100

(Source: Field survey, 2018)

4.2.1. Small-scale farmers` access to formal credit by farm experience

As indicated in table 4.2, the minimum farm experience of the small-scale farmers was 2 years while the maximum farm experience was 29 years. The average farm experience of the total sampled small-scale farmers is 10 years compared to 9 years` farm experience of small-scale farmers who accessed formal credit and 8 years farm experience of the small-scale farmers who did not access formal credit. This suggests

that small-scale farmers who accessed formal credit were relatively more experienced than small-scale farmers who did not access formal credit.

4.2.2. Small-scale farmers` access to formal credit by farm size

On the basis of the results in table 4.2, the minimum farm size of the small-scale farmers was 1 hectare, whereas the maximum was 8 hectares. The results indicate that average farm size of the total sampled small-scale farmers was found to be 3 hectares, with small-scale farmers who accessed formal credit and those that did not access formal credit being 3 hectares.

4.2.3. Small-scale farmers` access to formal credit by farm income

Averagely, the annual farm income of the total sampled small-scale farmers was R 45 324.64, with small-scale farmers who accessed formal credit and those that did not access formal credit being R40 000. The minimum farm income of the small-scale farmers was R 9333 whereas the maximum farm income was R 88 000.

4.2.4. Small-scale farmers` access to formal credit by household size

As displayed in table 4.2, the average household size of the total sampled small-scale farmers was 5 persons. The minimum household size was 1 whereas the maximum household size was 13. It is further indicated that the average household size of small-scale farmers who accessed formal credit and those who did not access formal credit was 9 and 6 members, respectively.

4.2.5. Small-scale farmers` access to formal credit by age

As indicated in table 4.2, the average age of the small-scale farmer was 54 years, with the maximum of 79 years and the minimum of 31 years, respectively. The average age of the small-scale farmers who accessed formal credit and those that did not access formal credit was 69 and 49 years, respectively. The result indicates that small-scale farmers who accessed formal credit were comparatively older than those who lacked formal credit access. This finding agrees with the work of Dube *et al.* (2015) which concluded that older tobacco farmers in Zimbabwe accessed more formal credit than younger ones. Quite the contrary, this finding contradicts the work of Sebopetji

and Belete (2009) which concluded that credit access is negatively correlated with age.

4.2.6. Small-scale farmers` access to formal credit by distance

Long distances travelled by small-scale farmers to the financial institutions lead to high transportation cost owing to that formal financial institutions are mainly situated in urban areas. The small-scale farmers were questioned about the kilometres they travelled from their farm to nearby financial institutions to determine the distance variable. On average, the distance that the total sampled small-scale farmers travelled was 12.65km, with those that accessed formal credit being 6 km and those that did not access formal credit being 9 km. Additionally, the minimum distance travelled was 2 km while the maximum distance travelled was 32 km. The small-scale farmers who are closer to financial institutions are inclined to have a higher chance of acquiring formal credit.

Table 4. 2: Small-scale farmers` access to credit by farm experience, farm size, farm income, household size, age and distance.

Variable	Farmers with access to credit N=59	Farmers with no access to credit N=81	Total N=140	Minimum	Maximum	Standard Deviation
	Mean	Mean	Mean			
Farm experience (Years)	9	8	10.61	2	29	6.747
Farm size (Hectares)	3	3	3	1	8	1.652
Farm income (Rands)	40000	40000	45324	9333	88000	22033
Household size (Numbers)	9	6	5.78	1	13	2.647
Age (Years)	69	49	54	31	79	13.971
Distance to the banks (Kilometres)	6	9	12	2	32	7.485

(Source: Field survey; 2018)

4.2.7. Small-scale farmers` access to formal credit by gender

As displayed in table 4.3, of the total sampled small-scale farmers, the female and male small-scale farmers were 50% and 50%, respectively. All the female and male small-scale farmers who had formal credit access were 28.8% and 71.2%, respectively whereas the male and female small-scale farmers who lacked formal credit access were 34.6% and 65.4%, respectively. It is apparent that the male small-scale farmers accessed more formal credit as compared to the female small-scale farmers.

4.2.8. Small-scale farmers` access to formal credit by collateral

Based on the results in table 4.3, of the sampled small-scale farmers, 50% had collateral whereas 50% of sample size did not possess collateral to secure their loan. Small-scale farmers who had formal credit access and collateral were 94.9% whereas those who had access to formal credit and did not have collateral were 5.1%. The small-scale farmers who lacked formal credit access but had collateral were 17.3% while those who lacked formal credit access and collateral were 82.7%. The results indicate that the small-scale farmers who accessed formal credit possessed more collateral (94.9%) than those who did not access formal credit (17.3%).

4.2.9. Small-scale farmers` access to formal credit by marital status

According to table 4.3, 50.7% of the sampled small-scale farmers were married while 49.3% of the small-scale farmers were unmarried. About 64.4% of the small-scale farmers who accessed formal credit were married while 35.6% of those who had access to formal credit were unmarried. About 59.3% of the small-scale farmers who did not access formal credit were unmarried while 40.7% of the small-scale farmers who did not access formal credit were married. It is indicated that most of the small-scale farmers were married.

4.2.10. Small-scale farmers` access to formal credit by education level

On the basis of the results in table 4.3, of sampled small-scale farmers, 51.4% had formal education whereas 48.6% had an informal education. The small-scale farmers who accessed formal credit and formal education were 66.1% while those who accessed formal credit and informal education were 33.9%.

In contrast, the small-scale farmers who did not access formal credit but had formal education were 49.4% while those who did not have access to formal credit but had informal education were 50.6%. The study indicates that the majority of small-scale farmers had a formal education.

4.2.11. Small-scale farmers` access to formal credit by extension services

As indicated by the results in table 4.3, 53.6% of the small-scale farmers received extension services while 46.4% of the small-scale farmers did not receive extension services in this study. The small-scale farmers who accessed formal credit and received extension services were 84.7% while those who accessed formal credit but did not receive extension services were 15.3%. Furthermore, the small-scale farmers who did not access formal credit but received extension services were 30.9% while small-scale farmers who did not access formal credit and extension services were 69.1%. The study points out that small-scale farmers who accessed formal credit received more extension services than small-scale farmers who did not access credit.

4.2.12. Small-scale farmers` access to formal credit by land ownership

As shown by the results in table 4.3, 55% of the entire sampled small-scale farmers owned land while 45% did not own land. The small-scale farmers who accessed formal credit and owned land were 91.5% while those who accessed formal credit but did not own land were 8.5%. The small-scale farmers who lacked credit access and did not own land were 71.6% while small-scale farmers who lacked credit access, but owned land were 28.4%. The small-scale farmers who accessed formal credit owned more land (91.5%) as compared to those who did not access formal credit (28.4%). This denotes that most small-scale farmers who are involved in this study own land.

Table 4. 3: Small-scale farmer`s access to formal credit by gender, marital status, collateral, extension services, education level and land ownership.

Variable	Small-scale farmers without access to credit N=81		Small-scale farmers with access to credit N=59		Total (N =140)	
	%	Freq	%	Freq	%	Freq
Gender	Female: 65.4	53	Female: 28.8	17	Female: 50	70
	Male: 34.6	28	Male: 71.2	42	Male: 50	70
Marital status	Married: 40.7	33	Married: 64.4	38	Married: 50.7	71
	Unmarried: 59.3	48	Unmarried: 35.6	21	Unmarried: 49.3	69
Collateral	Have collateral: 17.3	14	Have collateral: 94.9	56	Have collateral: 50	70
	Does not have collateral: 82.7	67	Does not have collateral: 5.1	3	Does not have collateral: 50	70
Extension Services	Receives extension services: 30.9	25	Receives extension services: 84.7	50	Receives extension services: 53.6	75
	Does not receive extension: 69.1	56	Does not receive extension: 15.3	9	Does not receive extension: 46.4	65
Land Ownership	Own land: 28.4	23	Own land: 91.5	54	Own land: 55	77
	Does not own land: 71.6	58	Does not own land: 8.5	5	Does not own land: 45	63
Education Level	Formal education: 49.4	40	Formal education: 66.1	39	Formal education: 51.4	72
	Otherwise: 50.6	41	Otherwise: 33.9	20	Otherwise: 48.6	68

(Source: Field survey; 2018)

4.2.13. Socio-economic characteristics of female and male small-scale farmers
 Table 4.4 summarise the results on the socioeconomic characteristics of female and male small-scale farmers. The table 4.4 indicate that only 57.1% of the male small-scale farmers were married while 42.9% of the sampled male small-scale farmers were unmarried.

On the other hand, 44.3% of the female small-scale farmers were married while 55.7% of the female small-scale farmers were unmarried. This implies that the GLM had more male small-scale farmers who are married as compared to their female counterparts.

Based on the results in table 4.4, of total sampled female and male small-scale farmers, 56.4% had a formal education whereas 43.6 % had an informal education. About 77.1% of the male small-scale farmers had formal education while 22.9% of male small-scale farmers had an informal education. The percentage of the female small-scale farmers who received formal education and those who received an informal education were 35.7% and 64.3%, respectively. The study indicates that most male small-scale farmers had more formal education as compared to the female small-scale farmers. This means that the female small-scale farmers had more informal education than their male counterparts and this makes them vulnerable to rejection from formal financial institutions because they might face some difficulties in the completion of loan applications (Lusardi and Tufano, 2015).

As shown in table 4.4, of the total sampled female and male small-scale farmers, 50% had collateral whereas 50% did not have collateral. The male small-scale farmers who possessed collateral were 64.3% while those who did not possess collateral were 35.7%. Furthermore, about 35.7% of the female small-scale farmers had collateral while 64.3% of the female small-scale farmers did not have collateral. According to the results in table 4.4, 53.6% of the sampled female and male farmers received extension services from extension officers while 46.4% of the sampled female and male farmers did not obtain extension services. The male small-scale farmers who received extension services and those who did not receive the extension services from extension officers were 58.6% and 41.4%, respectively.

However, the female small-scale farmers who received extension services and those who did not receive the extension services from extension officers were 48.6% and 51.4%, respectively. This is an indication that the male small-scale farmers received more extension services from extension officers as compared to female small-scale farmers.

This may be explained by the fact that male extension officers have a tendency of approaching the male small-scale farmers more than the female small-scale farmers assuming that extension advice will ultimately drip down from the male small-scale farmers to all female small-scale farmers (Food and Agriculture Organization, 2010).

According to the results in table 4.4, of sampled female and male small-scale farmers, 55% of the female and male small-scale farmers owned land while 45% of the female and male small-scale farmers did not own land. About 71.4% of the male small-scale farmers owned land while 28.6% of the male small-scale farmers did not own land. On the other hand, female small-scale farmers who owned land and those who did not own land were 38.6% and 61.4%, respectively. The study indicates that male small-scale farmers owned more land than female small-scale farmers in the study area and this may be explained by biased inheritance laws which tend to favour the sons over the daughters (Agarwal, 2003).

Table 4. 4: Socio-economic characteristics of female and male small-scale farmers.

Variable	Male small-scale farmers (N=70)		Female small-scale farmers (N=70)		Total (N =140)	
	Freq.	%	Freq.	%	Freq.	%
Marital status	Married: 40	57.1	Married: 31	44.3	71	50.7
	Otherwise: 30	42.9	Otherwise: 39	55.7	69	49.3
Education Level	Formal: 54	77.1	Formal: 25	35.7	79	56.4
	Informal: 16	22.9	Informal: 45	64.3	61	43.6
Collateral	Have collateral: 45	64.3	Have collateral: 25	35.7	70	50
	Does not have collateral: 25	35.7	Does not have collateral: 45	64.3	70	50
Extension Services	Receive extension services: 41	58.6	Receive extension services: 34	48.6	75	53.6
	Does not receive extension services: 29	41.4	Does not receive extension services: 36	51.4	65	46.4
Land Ownership	Own land: 50	71.4	Own land: 27	38.6	77	55
	Does not own land: 20	28.6	Does not own land: 43	61.4	63	45

(Source: Field survey; 2018)

4.2.14. Socio-economic characteristics of male and female small-scale farmers
Table 4.5 recap the results on the socioeconomic characteristics of female and male small-scale farmers. It is indicated that most (21.4%) of the male small-scale farmers belong to an age group of 40 – 49 and 60 – 69 years while most of the female small-scale farmers (25.7%) are in the age of 40 – 49 years. This indicates that most of the male small-scale farmers are both young and old whereas most of the female small-scale farmer were young and active. In other words, female small-scale farmers are more inexperienced relative to their male counterparts because maturity is usually associated with an experience. As shown in table 4.5, about 74.3% of the male small-scale farmers operated on a farm size range of 1 - 3 ha compared to about 60% of their female counterparts.

Furthermore, as indicated in table 4.5, about 35.7% of the male small-scale farmers earned an annual farm income of R20 000 – R40 000 while 30% of the female small-scale farmers earned an annual farm income ranging from R 40 000 – R60 000. This is an indication that the male small-scale farmers earned less farm income relative to the female small-scale farmers. The results showed most of the male small-scale farmers (64.3%) belong to a household size of 5 – 9 members whereas most of the female small-scale farmers (45.7%) belong to a household size of fewer than 5 members. This implies that the male small-scale farmers had more household members as compared to their female counterparts. Table 4.5 indicated that about 55.7% of the male small-scale farmers had a farm experience of less than 10 years as compared to 51.4 % of their female counterparts. The results showed that most (50%) male small-scale farmers travelled fewer than 10 km to the financial institutions as compared to female small-scale farmers (40%).

Table 4. 5: Socio-economic characteristics of female and male small-scale farmers.

Variable	Male small-scale farmers (N=70)		Female small-scale farmers (N=70)		Total (N =140)	
	Freq.	%	Freq.	%	Freq.	%
Distance (Kilometres)						
< 10	35	50	28	40	63	45
10 – 19	22	31.4	26	37.1	48	34.3
20 – 29	11	15.7	15	21.4	26	18.6
> 29	2	2.9	1	1.4	3	2.1
Total	70	100	70	100	140	100
Experience (Years)						
< 10	39	55.7	36	51.4	75	53.6
10 – 19	27	38.6	23	32.9	50	35.7
> 19	4	5.7	11	15.7	15	10.7
Total	70	100	70	100	140	100
Household size (Numbers)						
< 5	19	27.1	32	45.7	51	36.4
5 – 9	45	64.3	30	42.9	75	53.6
> 9	6	8.6	8	11.4	14	10
Total	70	100	70	100	140	100
Farm size (Hectares)						
< 1	1	1.4	2	2.9	3	2.1
1 – 3	52	74.3	42	60	94	67.1
4 – 6	14	20	22	31.4	36	25.7
> 6	3	4.3	4	5.7	7	5
Total	70	100	70	100	140	100
Age (Years)						
< 40	14	20	14	20	28	20
40 – 49	15	21.4	18	25.7	33	23.6
50 – 59	14	20	7	10	21	15
60 – 69	15	21.4	17	24.3	32	22.9
> 69	12	17.1	14	20	26	18.6
Total	70	100	70	100	140	100
Farm-income (Rands)						
< 20000	12	17.1	11	15.7	23	16.4
20000 – 40000	25	35.7	16	22.9	41	29.3
40000 – 60000	17	24.3	21	30	38	27.1

60000 – 80000	8	11.4	19	27.1	27	19.3
> 80000	8	11.4	3	4.3	11	7.9
Total	70	100	70	100	140	100

(Source: Field survey; 2018)

4.3. Empirical results from principal component analysis

This portion of the chapter is aimed at presenting the empirical results derived from the Principal Component Analysis (PCA). All the variables that were considered in this study were most influential in determining the perceptions of the female small-scale farmers towards the credit institutions in the Greater Letaba Municipality (GLM). The main aim of the PCA is to express the information as a set of new uncorrelated variables known as principal components. The PCA was carried out to get the principal components that determine the female small-scale farmers' perceptions toward the credit system.

Three components were extracted from the original variables of small-scale farmers' formal credit access in the GLM. The three extracted components explained 65.62% (Table 4.8) of the variations in the original variables of the female small-scale farmers that determine their perceptions towards the credit institutions. The three-retained components are as follows: (i) Small-scale farmers who receive credit based on their gender, (ii) Educated small-scale farmers with collateral and (iii) Small-scale farmers with their distance to the nearest banks.

4.3.1. Interpretation of results from principal component analysis

The Kaiser-Meyer-Olkin (KMO) test is used to measure the adequacy of the sample and also play a crucial role in testing whether the partial correlations amongst items are small or not. The values of KMO ranges between 0 and 1 and the values closer to 1 are suitable. According to Andy (2000) and Kaiser (1974), if the value of KMO > 0.5, then the sample is satisfactory. The value of KMO is 0.541 (see table 4.6) which indicates that the sample is satisfactory, and we may proceed with the PCA.

Furthermore, Bartlett's test of sphericity can be employed in testing the null hypothesis that the correlation matrix has an identity matrix (Norusis, 1988). The significant value

of < than 0.05 shows that the original data does not produce an identity matrix and are therefore suitable for further analysis (Andy, 2000). As indicated in table 4.6, Bartlett's test of sphericity was significant at 0.046 and this indicates that the correlation matrix has no identity matrix. The Bartlett's sphericity and KMO index were employed to check the suitability of the PCA for further analysis of the data.

Table 4. 6: KMO and Bartlett's test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.541
Bartlett's Test of Approx. Chi-Square	25.315
Sphericity Df	15
Sig.	0.046

The communality is known as the proportion of variance within each variable which can be explained by the principal component. The PCA is based on the assumption that all variances associated with variables are common, hence before extraction all the commonalities are 1. All the values found in the extraction column show the proportion of variance within each variable which can be explained by the principal components. As shown in table 4.7, collateral has the lowest communality of 0.508. In other words, this variable is less well explained by the analysis than any other variable.

Table 4. 7: Communalities.

	Initial	Extraction
Gender	1.000	0.679
Bank Preference	1.000	0.682
Collateral	1.000	0.508
Education Level	1.000	0.703
Distance to the nearest bank	1.000	0.581
Geographical Location	1.000	0.783

Extraction Method: Principal Component Analysis

The total variance of 65.620% (see Table 4.8) is attained for three components. The first component Eigenvalue is 1.575 and explains 26.246% of the variance, the second component Eigenvalue is 1.350 and explains 22.495% of the variance whereas the third component Eigenvalue is 1.013 and explains 16.878% of the variance in the original data.

Table 4. 8: Total variance explained.

Component	Initial Eigenvalues			Rotation Sums of Squared loading		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	1.575	26.246	26.246	1.465	24.412	24.412
2	1.350	22.495	48.741	1.289	21.487	45.899
3	1.013	16.878	65.620	1.183	19.721	65.620
4	0.767	12.781	78.401			
5	0.730	12.159	90.560			
6	0.566	9.440	100.000			

Extraction Method: Principal Component Analysis

Table 4.9 indicates all the components that were extracted from the analysis. The rotated component matrix, also known as the loadings, is the main output of the PCA. The rotated component matrix comprises estimates of the correlation between each of the variables as well as the estimated components. The variables, such as gender and bank preferences were loaded on component 1 (Small-scale farmers who receive credit based on their gender) whereas variables, such as education level and collateral were loaded on component 2 (Educated small-scale farmers with collateral) and ultimately the variables labelled geographical location and distance to the nearest banks were loaded on component 3 (Small-scale farmers with their distance to the nearest banks).

Table 4. 9: Rotated component matrix.

	Component		
	1	2	3
Banks preferences	0.795		
Gender	0.791		
Education Level		0.834	
Collateral		0.511	
Geographical Location			0.874
Distance to the nearest bank		0.464	0.593
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A. Rotation converged in 4 iterations.			

4.3.1.1. Small-scale farmers who receive credit based on gender

The first component, namely, small-scale farmers who receive credit based on gender explained 26.246% of the total variance in the original variables. The gender and bank preferences loaded heavily (>0.4) in this component. The loadings for gender and bank preferences had a positive sign and this signifies that these variables are positively correlated. This shows that the credit and gender variables are positively correlated. This implies that the small-scale farmers who belong to a certain sex category tend to access credit from formal banks than others. In this case, the perception of the female small-scale farmers towards the banks is that male small-scale farmers easily acquire credit from banks as compared to their female counterparts.

4.3.1.2. Educated small scale farmers with collateral

The second component, specifically, educated small-scale farmers with collateral explained 22.495% of the total variance in the original variables. The education level and collateral were heavily loaded (>0.4) in component 1. The loadings for education level and collateral had a positive sign and this indicates that there is a positive relationship between education level and collateral. This indicates that small-scale farmers who are educated and have collateral tend to access formal credit from formal banks because they have enough collateral to secure the credit. Small-scale farmers who are educated are more informed about financial institutions and ways of acquiring more collateral to secure their loan. Therefore, female small-scale farmers' perception, in this case, is that small-scale farmers with more education and collateral tend to access formal credit than small-scale farmers who are uneducated and has no collateral.

4.3.1.3. Small-scale farmers with distance to the nearest banks.

The third component, namely, small-scale farmers with distance to the nearest bank explained 16.878% of the total variance in the original variables. The geographical location and distance to the nearest banks variables were heavily loaded (>0.4) in component 3. The loadings for geographical location and distance to the nearest banks had a positive sign and this implies that the relationship between distance to the nearest banks and credit access is positive. This means that small-scale farmers

who are closer to the nearest banks would have a better knowledge, information and chance on accessing formal credit. The perception of the female small-scale farmers is that small-scale farmers who are near to the banks tend to access credit than those who are far away. In this case, urban small-scale farmers access formal credit easily than rural small-scale farmers because more financial institutions are in urban areas.

4.4. Empirical results from the probit regression model

This section contains the empirical results derived from the probit regression analysis. It further cast some light on the factors that influence formal credit access by both female and male small-scale farmers in the Greater Letaba Municipality (GLM). The probit model was used in analysing the data collected from a sample of 140 small-scale farmers (70 males and 70 females) interviewed using a structured questionnaire. Of the 140 small-scale farmers, 42.1% accessed formal credit whereas 57.9% did not access formal credit. Table 4.10 below summarizes the probit regression coefficients results of factors influencing access to formal credit by both female and male small-scale farmers.

Table 4. 10: Probit regression coefficients of factors influencing access to formal credit by both male and female small-scale farmers.

Independent Variables	Coefficient	Std. Err.	t-ratios	Significant
Experience	-0.001022	0.033243	-0.03	0.975
Education level	0.297161	0.453405	0.66	0.512
Marital status	-0.238819	0.215271	-1.11	0.267
Extension services	1.068274	0.553636	1.93	0.054*
Collateral	2.562894	0.623485	4.11	0.000***
Age	0.037638	0.021944	1.72	0.086*
Farm-income	-2.23e-06	9.25e-06	-0.24	0.810
Distance	0.010979	0.029024	0.38	0.705
Household Size	-0.025974	0.091234	-0.28	0.776
Gender	1.024591	0.463919	2.21	0.027**
Farm size	0.248553	0.146075	1.70	0.089**
Land ownership	2.388825	0.615776	3.88	0.000***
Constant	-7.289902	2.165985	-3.37	0.001
Number of observations		140		
-2 Log Likelihood		27.061		
McFadden Pseudo R ²		0.716		
Note: *, ** and***represents 10%, 5% and 1% level of significance, respectively.				

(Source: Field Survey; 2018)

The McFadden Pseudo R² is 0.716 and this indicates that 71.6% of the changes in the dependent variable, which is the small-scale farmers` formal credit access, is explained by the changes in the independent variables. Moreover, the variable coefficient with a positive sign implied that a variable with a higher value increases the likelihood of acquiring formal credit by small-scale farmers and vice versa, ceteris paribus. The findings from the study indicated that extension services, land ownership, gender, age, farm size and collateral had a positive significant influence on the access to formal credit by small-scale farmers.

This signifies that the small-scale farmers who own land, possess collateral, receive extension services and with larger farm size tend to obtain formal credit from formal banks. The probit results further indicated that farming experience, marital status, farm-income, household size had a negative insignificant influence on the small-scale farmers` formal credit access whereas education level had a positive insignificant influence on the small-scale farmers` formal credit access.

4.4.1. Age

The age variable was statistically significant at 10% and positively influenced small-scale farmers' formal credit access. This implies that the small-scale farmer's likelihood to access formal credit increases as they grow older because of the experience they have with the formal financial institutions. In other words, as the age of small-scale farmers increases their capacity to acquire formal credit will also increase. This finding is consistent with that of Oyedele and Akintola (2012) and Odoh *et al.* (2009).

4.4.2. Collateral

The coefficient of collateral is 2.562894; the positive coefficient is statistically significant at 1%. The implication is that the small-scale farmer is likely to increase or decrease his or her likelihood of accessing formal credit from formal financial institutions depending on the possession of collateral, *ceteris paribus*. This finding of the study is in line with the work of Ibrahim and Aliero (2012) and that of Abdalla and Ebiadalla (2012) which indicated that ownership of collateral had positively influenced small-scale farmer's credit access. This finding further agrees with the work of Hainz and Teksöz (2006) as well as Atieno (2001).

4.4.3. Gender

The coefficient of the gender variable is 1.024591; the positive coefficient is statistically significant at 5% and this variable is a dummy variable wherein female fall under the value of 0 whereas male fall under the value of 1. The implication is that a small-scale farmer is more inclined to acquire credit from formal banks if the small-scale farmer is male, *ceteris paribus*. The finding from the study indicates that most of the recipients of credit are male and concurs with that of Hussein, 2007; Sebopetji and Belete, 2009; Ololade and Olagunju, 2013 and Samuel *et al.* (2015).

4.4.4. Farm size

The coefficient of farm size was found to be statistically significant at 5% and positively influenced small-scale farmers' formal credit access. This implies that an increase in the farm size of the small-scale farmer would likely to increase the farmers' probability of accessing formal credit from formal financial institutions. In other words, the amount

of credit the small-scale farmer uses per hectare increases as the size of arable land increases (Amjad and Hasnu, 2007). Small-scale farmers who own large farm size would need credit to purchase many production inputs required to run a farm. The sign is as expected, and this finding corresponds with the findings of Muhammad *et al.* (2013) and Jeiyol *et al.* (2013).

4.4.5. Extension services

Extension service variable was statistically significant at 10% and positively influenced small-scale farmers' formal credit access in the GLM. The small-scale farmer is likely to increase his or her probability of accessing formal credit from formal financial institutions if the farmer receives extension services from extension officers. In other words, small-scale farmers who receive extension services are likely to have better knowledge about financial institutions and application procedures than non-recipients of extension services. The sign is as expected, and this work corresponds with the work of Dube *et al.* (2015) and Tetteh Anang *et al.* (2015).

4.4.6. Land ownership

The coefficient of land ownership is 2.388825; the positive coefficient is statistically significant at 1%. The implication is that the probability of small-scale farmers to access formal credit from formal financial institutions would likely to increase if the farmer owns land. In other words, owning land afford the farmer an opportunity to obtain credit because, in most cases, land is usually used as collateral to secure the loan. The sign is as expected, and the finding agrees with the work of Dube *et al.* (2015).

4.5. Discussion of hypothesis

Hypothesis: Socio-economic characteristics of both female and male small-scale farmers in the Greater Letaba Municipality do not influence access to formal credit.

The study findings do not agree with the hypothesis that the socio-economic characteristics of both female and male small-scale farmers in the Greater Letaba Municipality do not influence access to formal credit. However, extension services,

land ownership, gender, age, farm size and collateral have a positive significant influence on formal credit access by small-scale farmers, *ceteris paribus*.

Another factor with a positive sign was the education level, however, it was not statistically significant. The coefficient of the age variable ($AGE = 0.037638$) is statistically significant at 10% and this is an indication that small-scale farmer's likelihood to access formal credit increases as they grow older. This may be because maturity is usually associated with experience and as the age of small-scale farmers increase their capacity to acquire formal credit will also increase. The coefficient of the collateral variable ($COL = 2.562894$) is statistically significant at 1%. The implication is that, small-scale farmers who possess collateral tend to acquire more credit from formal finance.

As a result, the positive influence of collateral indicates farmers with more collateral have a higher chance of gaining access to formal credit. The gender variable ($GEN = 1.024591$) was statistically significant at 5% level and this signifies that male small-scale farmer easily obtained credit from formal banks than their female counterparts, *ceteris paribus*. On the farm size variable ($FS = 0.248553$), a positive coefficient was statistically significant at 5% and this is to say that an increase in the farm size of the small-scale farmer would likely to increase the farmers' probability of accessing formal credit from formal financial institutions.

The coefficient of extension services variable ($EXTS = 1.068274$) was statistically significant at 10% and this means the small-scale farmer is likely to increase his or her probability of accessing formal credit from formal financial institutions if the farmer receives extension services from extension officers. In other words, small-scale farmers who receive extension services are likely to better knowledge about financial institutions and application procedures than non-recipients of extension services. On the land ownership variable ($LO = 2.388825$), a positive coefficient is statistically significant at 1% with the implication that the probability of small-scale farmers to access formal credit from formal financial institutions would likely to increase if the farmer owns land because, in most cases, land is usually used as collateral to secure the loan.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This is the last chapter which contains the major findings of the study and outlines the conclusion drawn from the empirical results. The study has analysed and compared the factors influencing access to formal credit by both female and male small-scale farmers. The study was carried out in the Greater Letaba Municipality (GLM) which is in Mopani District of Limpopo Province. Furthermore, this chapter suggests hands-on recommendations to the policy makers and analysts to develop the credit policy that will consider the problems and challenges that small-scale farmers encounter in the study area as well as the area for future research.

5.2. Summary and conclusion

All the male and female small-scale farmers who accessed formal credit were 71 % and 29 %, respectively whereas the female and male small-scale farmers who lacked formal credit access were 65% and 35%, respectively. Actually, the male small-scale farmers accessed more formal credit than their female counterparts. About 50.7% of the entire sampled small-scale farmers were married while 64.4% of the small-scale farmers who accessed formal credit were married compared to 40.7% of the small-scale farmers who did not access formal credit. The sampled small-scale farmers' average age was 54 years, with an average of 69 years for small-scale farmers who had access to formal credit and 49 years for small-scale farmers who could not gain formal credit access. The indication is that the small-scale farmers who accessed formal credit were older as compared to the young ones who did not access formal credit.

On average, the distance that the total sampled small-scale farmers travelled was 12km, with those that accessed formal credit being 6 km and those that did not access formal credit being 9 km. The small-scale farmers who are closer to financial institutions are inclined to have a higher chance of acquiring formal credit. On average, 53.6% of the entire sampled small-scale farmers received extension services while 84.7% of the small-scale farmers who accessed formal credit and received extension services compared to 30.9% of those who did not access formal credit but received

extension services. The study indicates that most farmers who accessed formal credit received more extension services than the small-scale farmers who lacked credit access.

About 21.4% of the male small-scale farmers belong to an age group of 40 to 49 and 60 to 69 years while 25.7% of the female small-scale farmers are in the age bracket of 40 to 49 years. In other words, the female small-scales are more inexperienced relative to their male counterparts because maturity is usually associated with an experience. On average, about 57.1% of the sampled male small-scale farmers were married while 42.9% of the male small-scale farmers were unmarried. On the contrary, 44.3% of the female small-scale farmers were married while 55.7% of the female small-scale farmers were unmarried. This implies that the farming population had more male small-scale farmers who were married as compared to their female counterparts.

The male and female small-scale farmers who received extension services were 58.6% and 48.6% respectively whereas female and male small-scale farmers who did not obtain extension services were 51.4% and 41.1% respectively. This is an indication that the male small-scale farmers received more extension services from extension officers as compared to the female small-scale farmers. The Principal Component Analysis (PCA) extracted the important variables needed to determine the perceptions of female small-scale farmers towards the credit system in the GLM. The variables extracted in this study were loaded into 3 components with a Kaiser-Meyer-Olkin (KMO) of 0.046. The extracted components were used to determine female small-scale farmers` perceptions towards the credit system in the GLM. The extracted components comprise:

- Component 1, that is small-scale farmers who receive credit based on their gender which contains gender and bank preference.
- Component 2, that is educated small-scale farmers with collateral which include education level and collateral.
- Component 3, that is small-scale farmers with their distance to the nearest banks which contains geographical location and distance to the nearest banks.

The PCA results indicate that variables that are in the above-mentioned components have an influence on the perceptions of the female small-scale farmers in the GLM. The female small-scale farmers' perceptions towards the credit system that were derived from the PCA are as follows: (i) male small-scale farmers easily acquire credit from formal banks as compared to their female counterparts, (ii) small-scale farmers with more education and collateral tend to access formal credit than their counterparts who are uneducated and has no collateral as well as (iii) small-scale farmers who are near to the banks tend to access credit than those who are far away.

The probit model was employed in analysing the data collected from 140 small-scale farmers who were interviewed face-to-face with a structured questionnaire. Of the 140 small-scale farmers who were sampled, 42.1% accessed formal credit and 57.9% did not access formal credit. The study found out that factors, such as extension services, land ownership, gender, age, collateral and farm size are factors that had a positive effect on the small-scale farmers' formal credit access. In contrast, farming experience, marital status, farm-income and household size had an insignificant negative effect on the small-scale farmers' formal credit access whereas education level had an insignificant positive effect on the small-scale farmers' formal credit access.

The McFadden Pseudo R² is 0.716 and this indicates that 71.6% of the changes in the dependent variable (Y), which is the small-scale farmers' formal credit access, is explained by the changes in the independent variables. Based on the results of the probit regression analysis, factors that positively and significantly influenced small-scale farmers' formal credit access are extension services, land ownership, gender, age, collateral and farm size and this indicates that if a small-scale farmer increase in any of the aforesaid variables then their chance of gaining access to formal credit would increase.

5.3. Recommendations

Based on the study findings, a set of recommendations for achieving unbiased formal credit access by female and male small-scale farmers were put forward. These recommendations could be useful to policy makers in the GLM to improve existing

credit policy. Small-scale farmers` formal credit access is positively influenced by collateral possession, among other things. Since collateral possession is one of the most crucial factors which constrains small-scale farmers from accessing formal credit, hence, it is recommended that another way of securing formal credit should be introduced in the GLM.

The small-scale farmers are encouraged to form a group lending, and this is anticipated to open more doors for them when obtaining formal credit from financial institutions. Additionally, the findings of the study showed that the male small-scale farmers received more extension services from extension agents as compared to the female small-scale farmers and this may occur due to a large segment of the extension agents who provide that training are men and male extension agents rarely understand the rights, roles and responsibilities women face while performing agricultural activities. Hence, there is a need for the government to ensure that women are involved in formal agricultural education so that more female researchers or extension agents can be trained.

The dissemination of credit information by the extension agents must be increased to reach vulnerable and less privileged groups, such as female small-scale farmers and youth as a way of increasing their likelihood of accessing formal credit in the GLM. It is advisable that policy analysts and makers should formulate gender-sensitive policies which ensure all the small-scale farmers have unbiased credit access and other financial services. These policies should guide the formal financial institutions to take the issue of gender in consideration when providing credit to small-scale farmers and to be gender neutral. The government should ensure that vulnerable groups like youth and female small-scale farmers are given land rights to improve their likelihood of gaining credit access.

5.4. Future research

This study examined gender analysis of access to formal credit by small-scale farmers on a relatively smaller study area. It could be interesting if a similar study can be done on a large-scale study area with more focus on informal credit. Furthermore, studies should consider investigating the gender analysis of access to credit on both formal

and informal markets especially in LDCs. In this study cross-sectional data was used, however it could be interesting if panel data can be used in examining the gender analysis of access to formal credit.

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APPENDIX I

STRUCTURED QUESTIONNAIRE

UNIVERSITY OF LIMPOPO, TURFLOOP CAMPUS

DISCIPLINE: AGRICULTURAL ECONOMICS

**QUESTIONNAIRE ON GENDER ANALYSIS OF ACCESS TO FORMAL CREDIT BY
SMALL-SCALE FARMERS IN THE GREATER LETABA MUNICIPALITY**

Name of the interviewer:

Date of interview (dd/mm/yyyy):/...../.....

Questionnaire number:

A. DEMOGRAPHIC INFORMATION OF THE SMALL-SCALE FARMER

1. Age of the small-scale farmer in years.....

2. Education level of the small-scale farmer: Complete with a cross [X]

1	Formal education	
2	Informal education	

2.1. If formal education, indicate the level of education.

1	Primary level	
2	Secondary level	
3	Tertiary level	

3. Gender of the small-scale farmer:

1	Male	
2	Female	

4. Marital status of small-scale farmers:

1	Married	
2	Single	
3	Divorced	
4	Widowed	

5. Household size of the small-scale farmer in numbers?.....

6. Race of the small-scale farmer:

1	Black	
2	Indian	
3	White	
4	Coloured	

B. ACCESS TO SUPPORT SERVICES AND HOUSEHOLD INCOME

7. Did you applied for credit or borrowed money recently?

1	Yes	
2	No	

7.1. If yes, from which credit institutions (sources of credit)?

1	Commercial banks	
2	Money lenders	
3	Friends and relatives	
4	Stockvel	
5	Land bank	
6	Others (specify)	

7.1.1. What was the outcome of that credit application?

1	Application was approved	
2	Application still in process	
3	Application was rejected	

7.1.1.1. If the application was rejected, what was the reason given by the lender for rejecting the loan application?

1	Unacceptable collateral	
2	Incomplete loan application	
3	Problems with credit history	
4	Other (specify).....	

7.2. If no, what was the main reason why you did not apply for credit?

1	Did not think it would be approved	
2	High collateral requirements	
3	Complex application procedures	
4	No need for a loan	
5	Others (Specify).....	

8. Do you have collateral to secure your loan?

1	Yes	
2	No	

8.1. If yes, what type of collateral do you have?

1	Land	
2	Tractors	
3	Breeding livestock	
4	Other (specify).....	

9. How far is your home from the nearest lending institution in kilometres?.....

10. Do you get extension services?

1	Yes	
2	No	

10.1. If yes, for how long have you been receiving the services in years?.....

10.2. Who is providing these extension services?

1	Extensionist	
2	NGOs	
3	Others (specify).....	

11. What is the employment status of the small-scale farmers?

1	Part time	
2	Full time	
3	Unemployed	

12. What is your average farm income per year in Rands?.....

13. Now, does the small-scale farmer have a savings account?

1	Yes	
2	No	

13.1. If no, what is the main reason for a small-scale farmer not having a savings account?

1	No need for savings account	
2	Did not think it would be approved	
3	Little or no access to bank branches	
4	Complex application procedures	
5	Fees are too expensive	
6	Distrust of banks	
7	Other (specify).....	

C. AGRICULTURAL PRODUCTION INFORMATION

14. Do you own land?

1	Yes	
2	No	

14.1. If yes, how many hectares do you own?

14.2. Is there land enough for your needs or production?

1	Yes	
2	No	

15. How far is your farm from your home in kilometres?.....

16. How much farming experience do you have in years?

17. Do you have livestock?

1	Yes	
2	No	

APPENDIX II

D. FEMALE SMALL-SCALE FARMERS`S PERCEPTION ON CREDIT SYSTEM

18.How much do you agree or disagree with the following statements?

Statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	5	4	3	2	1
Male small-scale farmers receive credit easily than female small-scale farmers.					
Banks prefer giving credit to male small-scale farmers.					
Lack of collateral constrains credit access of female small-scale farmers.					
Educated female small-scale farmers access credit easily.					
Small-scale farmers who reside far away from the banks are less likely access to credit.					
Banks tend to offer credit to urban small-scale farmers than rural small-scale farmers.					

19.What challenges and issues do you come across as a small-scale farmer in this area?.....

Thanks for your valuable time