

## **CHAPTER 1: INTRODUCTION**

### **1.1 Background**

Small-scale farmers in communal areas of South Africa have limited access to factors of production including credit and information. Markets are often constrained by inadequate property rights and high transaction costs. Despite these problems, some small-scale farmers have managed to produce food for own consumption and for the market (Ortmann & King, 2006).

Credit is an important instrument for improving the welfare of the poor directly through consumption smoothing that reduces their vulnerability to short-term income. It also enhances productive capacity of the poor through financing investment in their human and physical capital (Okurut *et al*, 2004).

The demand for credit for productive investments usually comes from those poor who are less risk-averse and enables them to overcome liquidity constraints, making it possible to undertake investment that can boost production, employment and income. A study in Uganda has shown that the failure of formal banks to serve the poor is due to a combination of high risk, high costs and consequently low returns associated with such business (Okurut *et al.*, 2004).

In South Africa, Spio (2002) points out that, financial intermediaries have not been able to accommodate small-scale rural farmers because it is risky, costly and a difficult task associated with high transaction costs. Lack of information prevented large formal lenders who had capacity to serve the small farmers and the poor from doing so. The methods and practice of most banks in Limpopo Province did not meet the needs of their clients (Spio, 2002).

In the study on the accessibility to and impact of credit on small-scale farmers in Limpopo, Spio (2002) found that the difference in productivity between borrowers and non-borrowers is due to both the use of credit and to the preexisting inherent characteristics of farmers. The difference measures up to 40%, of which 21% is due to credit. Thus, credit can increase the output of a randomly selected farmer by 21%. In the same study, a socio-economic comparison based on the credit status of small-scale farmers indicates that borrowers have significantly higher values than non-borrowers, especially in area cultivated, input usage and productivity. The results further point out that borrowers do have an advantage in performance over non-borrowers as a result of inherent characteristics even when operating without credit (Spio, 2002). The inherent characteristics may include amongst others the farmers' experience in farming etc.

It is undisputable that small-scale farmers have always had a problem of access to credit. To improve the access improvement need to be made in the provision of financial services. Kgowedi *et al.*, (2002) point out that in order to improve

financial services, lenders need to consider the preferences and socio-economic condition of clients. This contributes to both regulatory process as well as product development. Thus, an understanding of characteristics influencing farmers' decision to use agricultural credit could assist policy formulation that could enhance welfare of the poor or those excluded from access to credit.

Furthermore, Ellinge & Ferley (2004) states that “evolutionary changes in the agricultural and financial sectors continue to impact the delivery of financial services to customers. As credit suppliers, agricultural lenders must adapt to these changes and identify the opportunities that exist in this rapidly changing environment. Successful institutions may need to become more customer-driven by identifying segments and niches that result in increased customer and lender value”

## **1.2 Problem statement**

South Africa has a dual agricultural economy, with both well-developed commercial farming and more subsistence-based production in the deep rural areas. Majority of the disadvantaged farmers are not part of the mainstream agriculture and practice subsistence agriculture in overcrowded, semi-arid areas in the former homelands. This kind of subsistence farming is characterized by low production, poor access to land and poor access to inputs and most importantly to poor access to credit.

Access to affordable credit is one of the most important factors affecting production and therefore income of the poor. The poor access to agrarian and support services are attributed to socio-economic factors of the farmers as well as constraints encountered by these farmers in institutions. Constraints encountered by the financial institutions in serving the small-scale farmers and the poor involve high risk and high transaction costs (Okurut *et al*, 2004 & Spio, 2002).

Although government has made some advances in broadening the access to credit, most small-scale and emerging farmers still do not have access to affordable credit for investment in the technology imperative for expanding and intensifying agricultural production or diversification of production into high value crops (Vink, 2003). The 2005 Development Report also states that black farmers have no access to credit, no access to financial services, and no access to grants other than those available for land reform beneficiaries and the Land Bank which was supposed to be charged with the responsibility of supplying the financial services required to develop the smallholder agriculture, will now concentrate on lending to established commercial farmers (DBSA, 2005).

Small-scale farmers are potentially competitive in certain activities and with proactive policy support, these opportunities could be developed into viable niches for a future smallholder sector. The challenge in South Africa is to remove

structural constraints that inhibit growth of a vibrant commercial smallholder sector (Kirsten & Van Zyl, 1998).

Thus, the problem of access to credit by small-scale farmers remains the major problem affecting their production capacity and level. Although servicing this category of farmers has been difficult and costly, credit extension to these farmers should be prioritized. Opportunities exist for lending institutions to serve this category of farmers. It is important to note that, despite the lack of access to credit and support services, some small-scale farmers, are still able to produce for own consumption and the market.

### **1.3 Significance of the study**

Most research studies on agricultural credit in South Africa are related to: accessibility to and impact of agricultural credit; credit saving patterns of resource-poor farmers and functioning of the rural financial markets. There are few studies on the subject of small-scale farm credit and how their socio-economic characteristics influence their decision about whether or not to take credit. This study aims to provide insight into this less studied dimension in agriculture by eliciting and analyzing small-scale farmers' socio-economic factors that affect their decision about credit.

Conventional methods of estimating the demand for credit used information from only those farmers who have actually used credit and neglected those who have not borrowed. Such studies could not account for farmers' initial decision about whether or not to borrow, consequently valuable information is wasted (Bagi, 1983). This study includes both information from the borrowers and non-borrowers to avoid this problem.

The study was undertaken in the Greater Letaba Local Municipality (GLLM) of Limpopo Province in South Africa. The area is one of the areas in which agriculture, forestry, tourism and small-scale farming predominates. Although the study area is small, the framework of the analysis could be used as a tool or instrument for behavior analysis in larger areas and could be applicable for areas with similar settings (Bekele, 2004).

#### **1.4 Objectives of the study**

- i. To analyze socio-economic characteristics that may influence farmers' decision about whether or not to use credit.
- ii. To quantify the probability that non-borrowers can borrow given that certain socio-economic characteristics are increased.

## **1.5 Research hypotheses**

The hypotheses of this study are as follows:

- i. Farmers' socio-economic characteristics affect farmers' decision to use credit.
- ii. Non-borrowers can borrow with increased level of their certain farmers' socio-economic characteristics.

## **1.6 Organization of the Dissertation**

The remainder of the study advances as follows: Chapter 2 discusses the literature review of the study, the methodology of the study is outlined in chapter 3, chapter 4 presents the empirical results of the study while chapter 5 presents the summary of the results and draw relevant conclusions and recommendations as well as providing a discussion for future research.

## CHAPTER 2: LITERATURE REVIEW

### 2.1 Introduction

Credit is one of the most significant bases of capital accumulation and may be viewed as a device for facilitating the temporary transfer of purchasing power from one individual or organization to another. It provides the basis for increased production efficiency through a specialization function (Kimemia, 2004). Access to credit is regarded as one of the key elements in raising agricultural productivity (DBSA, 2005).

This study adopts the definition of agricultural credit as defined by Ozowa (2007): *“agricultural credit encompasses all loans and advances granted to borrowers to finance and service production activities relating to agriculture, fisheries and forestry and also for processing, marketing, storage and distribution of products resulting from these activities”*.

The definition of a small-scale farmer as defined by Kirsten & Van Zyl (1998) was adopted by this study: *“a small-scale farmer is one whose scale of operation is too small to attract the provision of the services he/she needs to be able to significantly increase his/her productivity”*.



## **2.2 Agricultural credit in South Africa**

The South Africa's racial past continues to be reflected in its present agrarian structure. During apartheid era, white farmers enjoyed preferential access to agricultural credit. They were major beneficiaries of state irrigation schemes, and also benefited from price controls, protectionism, and subsidization (Fig, 2005). In contrast, few black farmers in the homelands received weak support services at a high fiscal cost and with narrow coverage. This category of farmers has not access to grants except that of Land Redistribution for Agricultural Development (LRAD), which is linked to land acquisition (DBSA, 2005).

The establishment of parastatal institutions with a mandate to channel credit to smallholder farmers is one of the approaches used by governments in developing countries to promote smallholder agricultural development (Machethe, 2004). In South Africa, the Land Bank and the Agricultural Credit Board were established to serve commercial farmers, while parastatals were established in the former homelands to serve smallholder farmers. The collapse of such parastatals left smallholder farmers without access to credit services. At the same time, the land Bank's mandate was broadened to accommodate those previously excluded from its service (DBSA, 2005).

The Land Bank in its annual report in 2004 reported that the loan amount granted for development farmers grew by 5.3% from R1 041 billion to 1 096 billion,

confirming the great progress made by the bank in carrying out its mandate of improving access to finance by resource-poor farmers, and on the other hand continuing to serve the commercial farmers. It is also important to note that during the year 2004 the bank has provided financial services to 36 751 and 27 028, commercial and development farmers, respectively. The Bank's micro-finance product, step up, disbursed a total of R169 million over the same period (Land Bank, 2004).

The realization of insufficient progress made to improving access to credit for smallholder farmers prompted the government to establish the Micro-Agricultural Finance Institutions of South Africa (MAFISA) (DBSA, 2005). The Scheme is supposed to address credit needs of smallholder farmers while the Land Bank concentrate on lending to established commercial farmers (AGRITV, 2006).

Bekele (2004) points out that in most developing countries, the impact of rural development programs and agricultural technology adoption by farmers are based on *ex-post* analysis of the intervention programs. The farmers are rarely consulted, *a priori*, about their specific circumstances, priority problems and their preference for type of intervention. Therefore the adoption behavior study comes after costs are incurred and the programs have been defused. Prior identification of farmers' preferences can help design more acceptable and cost effective development intervention programmes.

In South Africa, the launch of MAFISA pilot project is a great initiative as its objectives are (NDA, 2006):

- a. To test delivery systems and channels,
- b. To identify problem areas for solution prior to full roll-out,
- c. To determine the acceptability of terms in the market and
- d. To obtain information on performance for future business case projections.

The MAFISA pilot project is currently underway in three provinces, namely, Limpopo in Ga-Sekhukhune District Municipality, KwaZulu-Natal in Umkhanyagude District Municipality and the Eastern Cape in O.R Tambo District Municipality. A number of loans have already been processed, particularly through the Land Bank and Uvimba.

While MAFISA was still expected to be fully fledged in terms of implementation, the Ministry for Agriculture and Land Affairs has announced an establishment of the so-called Special Purpose Vehicle (SPV). This is expected to be a “one-stop-shop” for land and agricultural support services for land reform beneficiaries and all users and social partners. One of the key features of the SPV is that emerging black farmers and farm workers would be prioritized.

### **2.3 Review of previous studies**

Agriculture contributes to poverty alleviation in rural and urban areas and nationally, by reducing food prices, creating employment, increasing real wages and improving farm income. However, unless small holder agriculture reaches some degree of commercialization, the impact of agricultural growth on food insecurity and poverty alleviation is limited (SASIX, 2007). Kirsten & Van Zyl (1998) also argues that small-scale agriculture has the potential to generate employment and income opportunities in rural areas.

Pederson (2003) points out that even though agriculture is relatively a declining sector over the course of economic development, it is still the dominant sector in most developing countries. This dominance is due to the significance of the sector as a source of exports and as a major employer of the rural poor and women. Improvements in the financial markets can be a key stimulus for accelerating agricultural productivity.

Ortmann *et al* (2006) points out that the small-scale farmers in communal areas of South Africa have limited access to factors of production, credit and information, and markets are often constrained by inadequate property rights and high transaction costs. Despite these problems, some small-scale farmers have managed to produce food for own consumption and for the market.

Coetzee (2007) points out that the specialized farm credit institutions and the mechanisms of the conventional supply-led approach to rural credit, are poorly adopted to address the difficulties associated with rural finance. They typically do not diversify their client base and portfolio inside the rural areas. They usually are not integrated into larger institutions with urban operations and have limited urban diversification and risk pooling opportunities. With time however, more diverse approach to rural financial intermediation in rural areas became apparent and acknowledges the context and range of institutional options in different contexts. In some, setting a co-operatives or member-based institutions seem to be more appropriate, in others, setting credit programmes combining individuals and group technology seems appropriate (Coetzee, 2007).

It is undisputable that small-scale agricultural growth cannot be achieved without access to farmer support services. International experience has shown that with adequate access to farmer support services, smallholder farmers can significantly increase agricultural productivity and production. Small-scale farmers in Zimbabwe doubled maize and cotton in the 1980s when finance, extension and marketing services were provided (Rukuni & Eicher, 1994). Furthermore, the provision of training and financial services through credit is important to increase efficiency of resource-poor farmers (Mushunje & Belete, 2001).

Access to agricultural support services therefore remains the major factor constraining the growth of small-scale agriculture in South Africa, most especially the former homelands. Experience from other countries indicates that a comprehensive approach to the provision of support services is required to achieve growth in the small-scale agriculture sector (SASIX, 2007).

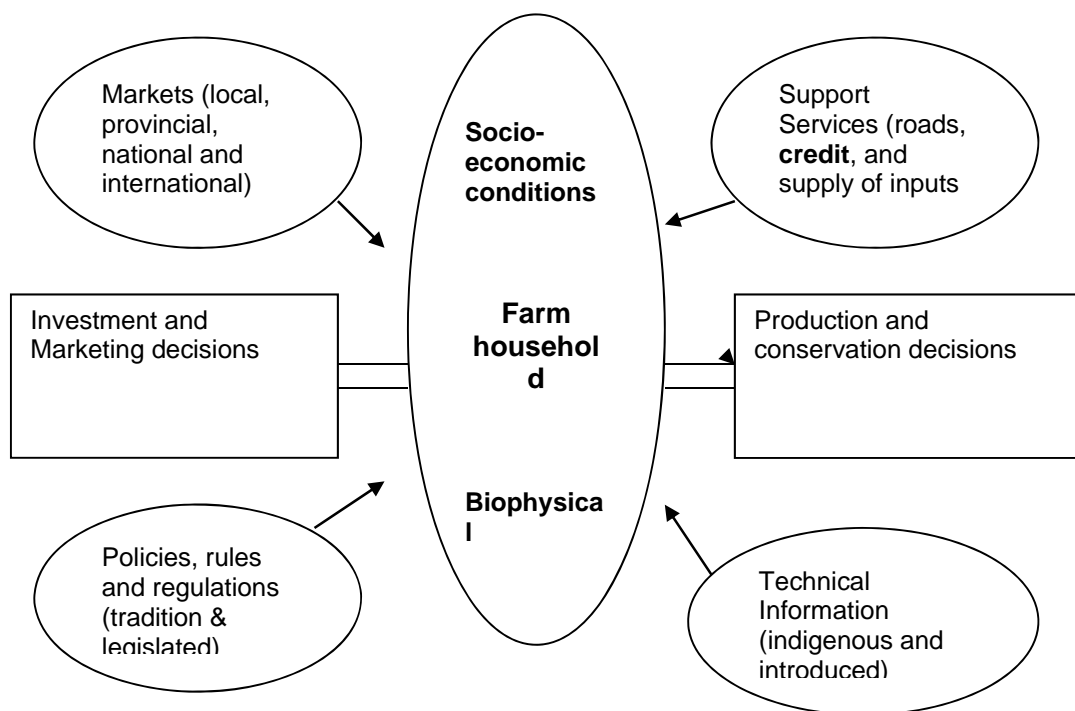
In South Africa, comprehensive support programmes are available (e.g. Comprehensive Agricultural Support Programme). However, the lion's share of the budget is channeled to beneficiaries of Land Redistribution beneficiaries. This leaves farmers in the former homeland and those farming in communal with little or no support except approaching financial institution for credit.

The problems associated with small-scale farmers accessing credit are not exhaustive. Perhaps it is important to focus on some of the factors that affect farmers' decision in deciding whether or not to take credit. Müller (1974) as quoted by Bagi (1983) referred the farming experience, education and frequency of contact with extension service as the indicators of managerial ability of a farmer. Farmers with better contacts, better education, hence better information, are likely to participate in the markets. All these managerial traits are likely to be positively related to the farmers' decision to use credit.

Furthermore, Bagi (1983) found out that the probability of using short-term credit as well as long term credit is directly related to the length of farming experience,

level of formal education, frequency of contact with the extension agent, and size of the farm. This implies that increasing all of the above factors would increase the probability the farmers take credit and vice versa, *ceteris paribus*.

**Figure 2.1: The interaction between factors influencing farm households decision**



Source: French (2007)

According to French (2007) farm household is the level at which most resources allocation decisions are made. A central factor affecting investment, production and conservation decisions is the farmers' level of control over his land. A farmer with secure tenure is more likely to think of long-term production and

conservation activities. The interaction between factors influencing farm household's decision is summarized in figure 2.1. The decision is not linear as farmers consider the factor listed simultaneously. Of interest is the inclusion of credit among the factors.

Literature shows that farmers with lack of collateral in terms of land and other assets normally access credit through informal lender who normally charges higher interest rates. Larson *et al.* (1994) argues that borrowers choose informal financial services because of easy access, variable loan size, flexible repayment schedule, personal guarantees, convenience and very short period needed to obtain loan approval.

Kgowedi *et al.* (2002) studied the factors distinguishing the choice of moneylenders and non-money lender and found that age, level of occupation, and marital status are important determinants for the choice between the financial services of moneylenders and non-moneylenders. The study also found that income influences the choice of a moneylender.

Coetzee (2007) points out that a preferable approach in ensuring the availability of efficient rural finance services (including saving) rather than extending credit to finance exclusively agricultural production is a preferred approach when rural development is pursued. Kimemia (2004) argues that the establishment of efficient forms of rural financing is a vital aspect of rural development.



Commercial banks tend to largely steer clear from micro financing- especially in rural areas –as a way of hedging against the risk.

Based on the literature provided, it is evident that access to agricultural support services including credit remains the major factor constraining the growth of small-scale agriculture in South Africa, most especially in the former homelands. Furthermore, access to credit coupled with preexisting inherent characteristics of some credit users increases the productivity of small-scale farmers. Managerial traits such as, better contacts, better education, hence better information, are likely to influence farmers to participate in the markets and also their decision to use credit. It is also evident that financial institutions distance themselves with serving small-scale farmers due to risk and costs implications associated with serving this category of farmers.

## **CHAPTER 3:                    METHODOLOGY**

### **3.1    Introduction**

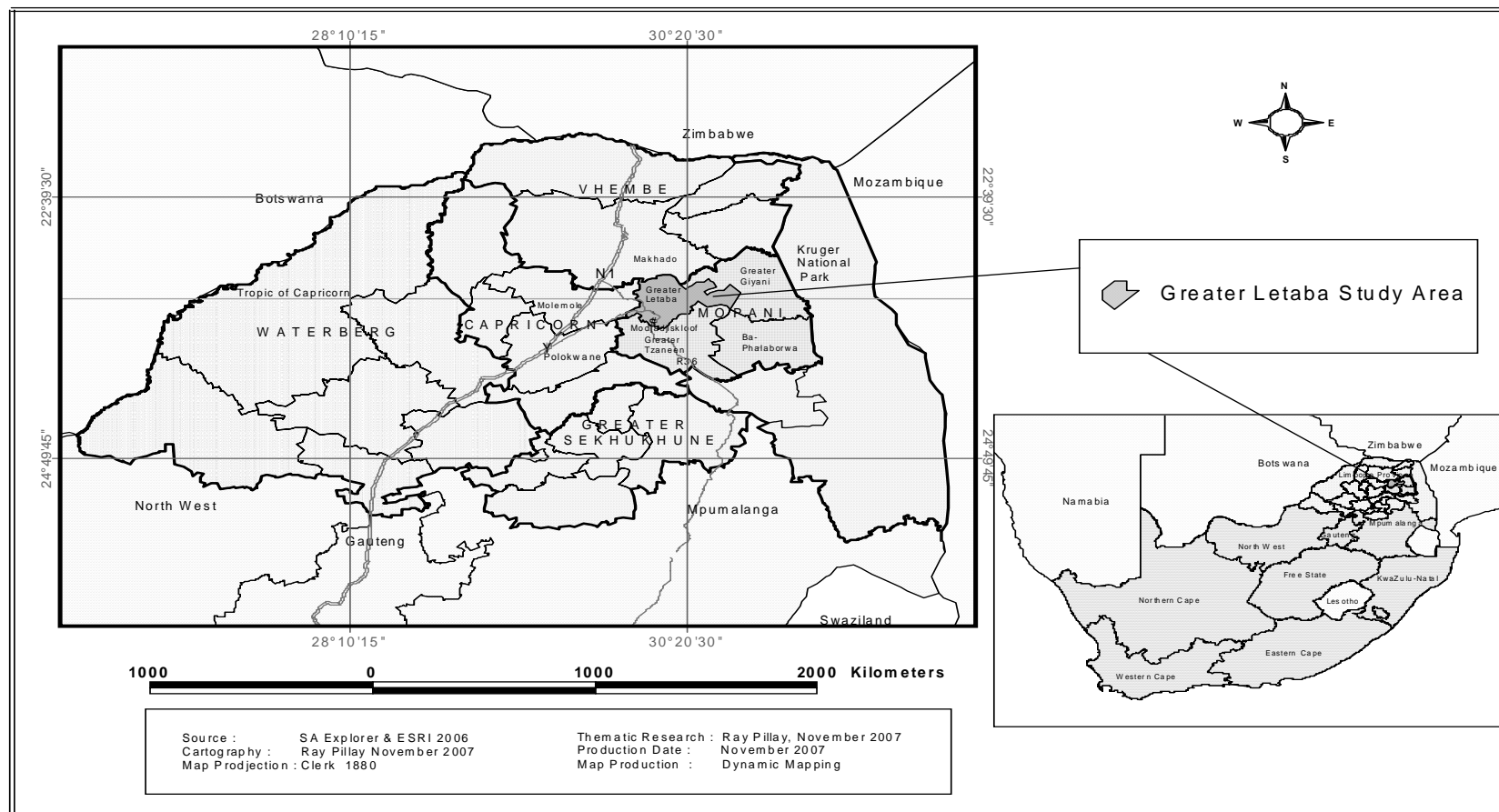
Taking into consideration cost implications, cross-sectional data on 73 farmers in the study area was used. Of the 73 households sampled, 57 were non-borrowers and 16 were borrowers. The data was collected by means of personal interview using structured questionnaires in a sample survey done in the July 2006 season.

The next section of this chapter discusses the location and description of study area, questionnaire design, sampling procedure. Section 3 discusses the econometric model, being the binary probit model and specification of the model used in the study.

### **3.2    The study area**

#### **3.2.1   Location**

This study was undertaken in the Greater Letaba Local Municipality (GLLM) falling under Mopani District Municipality in the Limpopo Province (See figure 3.1 for a location map of the study area). Limpopo Province is divided into six districts, namely: Mopani, Vhembe, Sekhukhune, Waterberg, Bohlabela and Capricorn districts (TIL, 2005).



**Figure 3.1: Location map of the Greater Letaba Study area in the Mopani District Municipality, Limpopo Province.**

Limpopo Province is located in the northern part of South Africa's nine provinces. It covers 124 000km<sup>2</sup>, about 10% of South Africa's surface area. It is bounded to the south by Gauteng Province and to the west, north and east by Botswana, Zimbabwe and Mozambique, respectively. Limpopo's capital Polokwane lies just 300 kilometers (km) north of South Africa's main markets in the Johannesburg-Pretoria industrial complex, and 200km south of the province's border with Zimbabwe. Limpopo province is close enough to serve South Africa's main markets, and well positioned for exports (TIL, 2005).

Limpopo Province contributes about 6.5% to the national economy. Mining, manufacturing, general government services and finance, real estate and business services are the dominant economic sectors in the province, accounting for 60% of the province's gross domestic product (GDP) (TIL, 2005).

Limpopo Province is divided into six district municipalities, namely, Bohlabela, Mopani, Vhembe, Capricorn, Waterberg, and Sekhukhune (SALGA, 2007). The study was conducted in the Greater Letaba Local Municipality, which falls under the Mopani District Municipality.

Mopani District Municipality is one of the forty-two district municipalities in South Africa. It is a category "C" municipality based in the Northern-Eastern part of Limpopo Province. It is made up of four category "B" local municipalities, namely: Ba-Phalaborwa (which is predominantly a mining and tourism area), Greater

Giyani (it prides itself with agriculture), Greater Letaba (a leading area of agriculture, forestry, tourism and a small scale of mining), and the Greater Tzaneen (which is also a leading area of agriculture, forestry, tourism and a small scale of mining). A category “B” municipality is the one (LIMPOPO-DLGH, 2006).

In terms of the Chapter 7 of the South African constitution, municipalities are divided into three, that is, category “A”, “B” and “C”. A category “A” municipality has exclusive municipal executive and legislative authority in its area. A category “B” municipality is a municipality that shares municipal executive and legislative authority in its area with a category “C” municipality within whose area it falls. Lastly, A category “C” municipality has municipal executive and legislative authority in an area that includes more than one municipality (Constitution of the Republic of South Africa, 1996).

### **3.2.2 Description of the study area**

The study area, the Greater Letaba Local Municipality (GLLM), is a leading area in terms of agriculture, forestry, tourism and small scale mining in Limpopo Province. The GLLM incorporates townships of Kgapane and Ga-Modjadji. It is the largest producer of tomatoes in the southern hemisphere and thus hosts the ZZ2 tomato estate. The economic centre of the GLLM is the town of Modjadjiskloof, named after Queen Modjadji, formerly known as Duiwelskloof (MOPANI, 2006).

The GLLM is a category “B” municipality divided in to 23 wards. It is situated in the northern-eastern quadrant of the Limpopo Province within the Mopani District Municipality area of jurisdiction. There are ±79 rural villages within the municipal area and 94% of the people live on state land under custodianship of Traditional Authorities in rural villages (IDP, 2006).

### **3.2.3 Design of the questionnaire**

The questionnaire was designed to collect information on farmer-household socio-economic characteristics that were considered to be affecting the small-scale farmers’ decision on whether or not to take credit (see Appendix A). The characteristics include amongst others the following: Size of arable land in hectares, farmers’ age in years, number of years of formal education, gender, marital status, membership of farmers’ associations; interest paid on credit, farming experience in years, off-farm income, family size (number of people in the household) at the time of interview, farm-income in Rand per annum and number of visits by agricultural extension officers of the previous year.

### **3.2.3 Sampling procedure**

Simple Random Sampling was used taking into consideration cost implications and other relevant factors such as the extent of the study area. The study concentrated on short-term credit, thus cross-sectional data was used. The advantage of simple random sampling is that it is simple and easy to apply when small populations are involved. However, because every person or item in a

population has to be listed before the corresponding random numbers can be read, this method is very cumbersome to use for large populations (ABS, 2005).

### **3.3 Econometric Model**

#### **3.3.1 General consideration**

Response choices in an opinion survey often appear as a discrete choice rather than a continuous one. Discrete choice variables fall in two categories: the first is an ordered variable; the second is an unordered variable. Such choices can however be categorized into two groups so that they are seemingly treated as a binary choice set. It enables to apply a conventional binary logit or probit model (Yoshida, 1998).

#### **3.3.2 Binary probit Model**

The difference between the logit and the probit models lies in the distribution of errors. In logit models, errors are assumed to follow standard logistic distribution while the errors of the probit models are assumed to follow the standard normal distribution (Indiana, 2006).

According to Nagler (2002), probit model constrains the estimated probabilities to be between 0 and 1 and relaxes the constraint that the effect of the independent variable is constant across different predicted values of the dependent variable. This is normally experienced with the Linear Probability Model (LPM). The probit model assumes that while we only observe the values of 0 and 1 for the variable

Y, there is a latent, unobserved continuous variable  $Y^*$  that determines the value of Y. The other advantages of the probit model include believable error term distribution as well as realistic probabilities (Nagler, 1994). Thus, for this study the probit model is preferred and used.

We assume that  $Y^*$  can be specified as follows:

$$Y_i^* = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} + \nu_i \dots \dots \dots (1)$$

And that:

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

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

Where  $x_1, x_2, \dots, x_k$  represent vector of random variables,  $\beta$  represent a vector of unknown parameters and  $\nu$  represent a random disturbance term (Nagler, 2002).

### 3.2.2 Model specification

The probit model specified in this study to analyse farmers' decision about whether or not to use credit can be expressed as follows:

$$Y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9 + \beta_{10} x_{10} + \beta_{11} x_{11} + \nu \dots \dots \dots (2)$$



The definition of variables is shown in table 3.1 below.

**Table 3.1: Farmer-household characteristics affecting farmers' decision about whether or not to use credit**

$Y_i$	Small-scale farmers' decision to use credit (dependent variable) which takes the value of 1 if the farmer used credit, 0 otherwise
$x_1$	Size of arable land in hectares
$x_2$	Farmers' age in years
$x_3$	Number of years of formal education
$x_4$	Gender; 1 if a farmer is a male, 0 otherwise
$x_5$	Marital status; 1 if married, 0 otherwise
$x_6$	Membership of farmers' associations; 1 if a farmer is member, 0 otherwise
$x_7$	Farming experience in years
$x_8$	1 if a farmer has off-farm income, 0 otherwise
$x_9$	Family size (number of people in the household) at the time of interview
$x_{10}$	Farm-income in Rand per annum
$x_{11}$	Number of visits by agricultural extension Officer of the previous year

## **CHAPTER 4:                   EMPIRICAL RESULTS AND THEIR DISCUSSION**

### **4.1    Introduction**

The empirical results of this study are presented in this chapter. The socio-economic characteristics of the farmers as well as the hypotheses are discussed in this chapter.

### **4.2    Socio-economic characteristics of households**

A total of 73 farmers were involved in the study, 57 were non-borrowers and 16 were borrowers. Table 4.1 summarizes socio-economic characteristics of the households. The average age of the household head in the sample is 53 years, with that of borrowers being 47 years compared to 55 years for the non-borrowers. All the farmers in the sample cultivated on communal land (have no title deeds to the land), thus land cannot be used as collateral for loans. This may be attributed to the fact that the area is mostly rural and under the custodianship of Traditional Authorities and probably most of the little private agricultural land in the area is in the hands of white commercial farmers.

Overall, non-borrowers' education level is 50% higher than that of borrowers. This implies the borrowers may be having enough off-farm income and thus no need for them to borrow. Of the sampled farmers, all the borrowers were males

and 24% of the sampled non-borrowers were female. It is evident that the households sampled were mostly male headed. Overall, 81% of the sampled households were married while 93% of borrowers were married compared to 77% of the non-borrowers. The overall farming experience is 14 years compared to 18 years for borrowers and 12 years for non-borrowers.

**Table 4.1: Averages for some of the demographic, social and income levels of the sampled households/farmers**

Variable	Total (73)	Borrowers (16)	Non-borrowers (57)
Farmers' age (years)	53	47	55
Number of years of formal education	6	3	6
Gender	80% male 20% female	100% male 0% female	77% female 23% male
Farming experience in years	14	18	12
Size of arable land (ha)	6	6	6
Off-farm employment	16%	13%	17%
Marital status	81% married	93%	77%
Average farm income (R)	R50,320.00	R26,688.00	R23,632.00
Membership of farmers' association	82%	68%	84%

Source: survey 2006

From pooled data, as summarized in table 4.1, the overall average size of arable land is 6 hectares and is equal to the averages for both borrowers and non-borrowers at 6 hectares. It should be noted that although the farmers farmed on communal land, each farmer had Permission to occupy a given size of land. The average farm income for borrowers is higher compared to that of non-borrowers. This is in consistency with other findings (e.g. Spio, 2002).

Overall, 17% of non-borrowers had off-farm income compared to 13% of borrowers. This makes sense as non-borrowers had higher education level compared to borrowers and which may imply that non-borrowers have better jobs and thus higher off-farm income than borrowers. Thus, households with more off-farm income are less likely to borrow. This does not imply that access to credit is not a problem to non-borrowers. Overall, 82% of the sampled households were member of certain farmers' association, with an average of 68% for borrowers and 84% for non-borrowers.

### **4.3 Empirical Results**

Binary probit model was used to analyse the data obtained from 73 farmers who were interviewed by means of a structured questionnaire (See Appendix A). Of the 73 farmers sampled, 16 were borrowers and 57 were non-borrowers. The results of this study were estimated by Maximum Likelihood-Binary Probit model based on the data collected from 73 small-scale farmers in the Greater Letaba Municipality (GLLM).

Table 4.2 summarizes the results of the binary probit regression coefficients of factors affecting farmers' decision about credit. Overall, the model predicts 84.93% (94.74 of the Dep=0 and 50.00% of Dep=1) of the sample. It is evident that factors such as gender, marital status, farming experience, off-farm income and number of contact of Extension Officers with farmers, are some of the factors which have a positive effect on the farmers' decision to use credit.

Positive (negative) sign on an explanatory variable's coefficient indicates that the higher the values of the variable increase (decrease), the likelihood that a small scale farmer may use credit and vice versa. For instance, on the variable  $x_2 = -0.04.8838$ , statistically significant at 10% level, indicates that, the likelihood that a farmer uses credit decreases with age, *ceteris paribus*. This is true for this study as the average age for the borrowers (47 years) is lower than that of non-borrowers (55 years) (see table 4.1).

On the variable  $x_7 = +0.073303$ , the positive co-efficient is statistically significant at 5% level and suggests that increases in the farmers' experiences on farming would result to an increase in the likelihood that farmers use credit and vice versa, *ceteris paribus*. The sign is as expected and in consistency with other findings.

**Table 4.2: Binary Probit regression coefficients of factors affecting small scale farmers' decision whether or not to use credit**

Variable (1)	Estimated coefficients (2)	Standard errors (3)	t-ratios (4)	Probability (5)
$x_1$	-0.028067	0.033208	-0.845193	0.3980
$x_2$	-0.048838**	0.020951	-2.330998	0.0198
$x_3$	-0.138966**	0.068007	-2.043413	0.0410
$x_4$	1.210824**	1.059342	1.142997	0.2530
$x_5$	1.090860**	1.037531	1.051399	0.2931
$x_6$	-0.835758**	0.594190	-1.406549	0.1596
$x_7$	0.073303*	0.040179	1.824444	0.0681
$x_8$	0.312150	0.742965	0.420141	0.6744
$x_9$	-0.000643	0.077597	-0.233918	0.9934
$x_{10}$	-2.40E-06	1.02E-05	-0.233918	0.8150
$x_{11}$	0.009457	0.021584	0.438155	0.6613
Number of observations at one:		16		
Number of observations at zero:		57		
Log likelihood:		-24.09014		
Cases predicted correctly (%):		84.93		
** Significant at 10% level				
* Significant at 5% level				

Source: Survey 2006

The coefficient of  $x_4 = +1.210824$  is statistically significant at 10% level and implies that targeting male headed households would result into a positive response towards credit use compared to females. All sampled borrowers in the study were male, implying that targeting male headed households may have positive outcome in terms of response in taking credit. It may also be argued the same for the female headed households who borrowed and if they do exist in the area.

The coefficient of  $x_5 = +1.090860$  is also statistically significant at 10% level, and implies that married household heads are likely to take credit compared to others who were included in the sample. The probabilities for each variable are summarized in column 5 of Table 4.2 and they represent the level at which each variable is significant. For instance, on the variable marital status ( $x_5$ ), the probability that married households can take credit compared to other respondents in the sample is predicted at 29.31%.

On the contrary, size of arable land, family size and farm income have been found to have non-significant negative effect on the decision to use credit. FAO (1996) as quoted by Spio (2002) indicates that ownership as opposed to rental or a use of communal land increases the size of the loan because it may increase long run investment of incentives and the collateral value of the land to the lender. The reason for this is that farmers have no title to the land and there is no incentive for financial institution to extend more credit.

#### 4.4 Discussion of the hypotheses

Hypothesis 1: Farmers' socio-economic characteristics affect farmers' decision about credit.

The findings of the study strengthen the hypothesis that some farmer-household characteristics affect farmers' decision on whether or not to use credit. Other things being constant, gender, marital status and farming experience have a significant positive influence on the farmers' decision about credit use. Other factors with a positive sign, but not statistically significant include, off-farm income and frequency of contact with Extension Officers.

The coefficient of the variable gender ( $x_4 = +1.210824$ ) is statistically significant at 10% level and implies that targeting male headed households would result into a positive response towards credit use, *ceteris paribus*. However, it may also be argued that targeting female headed households may also yield good response towards use of credit as they were not part of this analysis. The exclusion was due to the sampling method used, that is, simple random sampling.

The coefficient of  $x_5 = +1.090860$  was found to be statistically significant at 10% level with the implication that married household heads are likely to take credit compared to others (divorced, widower and single) who were included in the sample. On the variable  $x_7 = +0.073303$ , the positive co-efficient is statistically



significant at 5% level and suggests that increases in the farmers' farming experiences would result to an increase in the likelihood that farmers use credit and vice versa, *ceteris paribus*.

Hypothesis 2: Non-borrowers can borrow with increased level of their certain farmers' socio-economic characteristics

The findings of the study provide support for this hypothesis. Thus, increasing some of the respondents' characteristics would increase the likelihood that the farmers may borrow.

For instance, The variable  $x_4 = +1.210824$  is statistically significant at 10% level and likelihood that targeting male headed households would yield a positive response in terms of the use of credit is estimated at 25.30%. For the variable  $x_5 = +1.090860$  which is also significant at 10% level, the probability that married households can take credit compared to other respondents in the sample is predicted at 29.31%. Lastly, for the variable  $x_7 = +0.073303$  significant at 5% level, increasing the farming experience of the farmer by 0.073373 would increase the likelihood that the farmer would borrow by 6.81%, *ceteris paribus*.

## **CHAPTER 5: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS**

### **5.1 Introduction**

This chapter discusses the summary, conclusion and policy implications derived from the study. Possible future research is also discussed in this chapter.

The study has analyzed the factors considered to be affecting small-scale farmers' decision about whether or not to use agricultural credit. The study was conducted in the Greater Letaba Local Municipality, situated within the jurisdiction of Mopani District Municipality in the Limpopo Province, Republic of South Africa.

### **5.2 Summary and conclusion**

Binary probit model was used to analyse the data obtained from 73 small-scale farmers who were interviewed by means of a structured questionnaire. Of the 73 farmers sampled, 16 were borrowers and 57 were non-borrowers. Overall, the model predicts 84.93% (94.74 of the Dep=0 and 50.00% of Dep=1) of the sample. The study found out that factors such as gender, marital status, farming experience, off-farm income and number of contact of Extension Officers with

farmers, are some of the factors which have a positive effect on the farmers' decision to use credit.

The average age of a randomly selected farmer was found to be 53 years, with an average of 47 years for borrower and 55 years for the non-borrowers. All the farmers in the sample cultivated on communal land (have no title deeds to the land), thus land cannot be used as collateral for loans. Overall, non-borrowers' education level is 50% higher than that of borrowers. Of the sampled farmers, All of the borrowers were males and 24% of the sampled non-borrowers were female (76% male). It is evident that the households sampled were mostly male headed. Overall, 81% of the sampled households were married while 93% of borrowers were married compared to 77% of the non-borrowers. The overall farming experience for the entire sample is 14 years compared to 18 years of borrowers and 12 years of non-borrowers.

The average farm income for borrowers is higher compared to that of non-borrowers. Overall, 17% of non-borrowers had off-farm income compared to 13% of borrowers. This makes sense as non-borrowers had higher education level compared to borrowers and which may imply that non-borrowers have better jobs and thus higher off-farm income than borrowers. Thus, households with more off-farm income are less likely to borrow.

The following variables: gender, marital status and farming experience in years are statistically significant. Thus increase in farmers' experience in years would result in an increase in the likelihood that farmers use credit and vice versa, *ceteris paribus*. The same goes for gender, targeting male headed households would result into a positive likelihood that they take credit. It was also revealed that targeting female headed household may also result into increase in the use of credit. And finally, targeting farming households with married couples increase the likelihood that they take credit compared to others included in the sample.

On the other hand, farmers' age in years, numbers of years of formal education and membership to farmers' association have significant negative impact on the likelihood that the farmer may use credit. The significant negative impact by the number of years of formal education in this study makes sense as most borrowers had little or no formal education. In fact the education level of the non-borrowers is 50% higher than that of the borrowers. For the membership of farmers' association, the insignificance influence also makes sense as in total, 82% of the sampled households indicated they are members of the certain farmers' association. As for age in years, the fact that borrowers are on average younger than the non-borrowers.

Furthermore, size of arable land, family size and farm income have been found to have non-significant negative effect on the decision to use credit. The insignificance of arable land is as expected and is similar to the findings by Spio

(2002). This may be due to the fact that the farmers have not title deeds to the land and there is actually no incentive for lenders to offer more credit to farmers in this area.

### **5.3 Policy implications**

Emphasis was made that small-scale farmers have limited access to factors of production, credit and information, and markets are often constrained by inadequate property rights and high transaction costs. Despite these problems, some small-scale farmers have managed to produce food for own consumption and some surplus for the market.

This study therefore advocates and emphasizes access of agricultural credit by small-scale farmers as a major factor in their production processes and efficiency. It was conspicuously expressed that the introduction of Microfinance Agricultural Institutions by the South African government is welcomed as it is seen as policy to enable the access of credit to farmers.

This study recommends that there be training among farmers, both borrowers and non-borrowers in the identification of profitable projects and the use of production credit. Production credit is recommended for the area as there are no possibilities of long term financing as most of the land in the area is communal and without title deeds. The same training may stimulate the demand for credit

among those farmers who are currently not credit adopters. These training programmes targeting vulnerable groups like: female headed-households, youth, the disabled and people living with HIV/AIDS may yield good results.

Kimemia (2004) recommends that skilled farm managers with small financial resources may be brought together with those with substantial financial resources but who lack farm managerial ability. Such a merger may be more productive than if the two groups were working individually. This study supports this recommendation in a way of formulating an Agricultural Co-operatives among these farmers, especially after the inception of the Co-operative Incentive Scheme (CIS) by the Department of Trade and Industry. The scheme CIS is designed to address the following market failures encountered by cooperative enterprises (DTI, 2007):

- a. High cost of working capital to allow effective market entry;
- b. Lack of access to finance;
- c. Lack of participation in the formal economy by co-operatives, in particular those owned by black persons (especially those in rural area), women, persons with disability and youth;
- d. Low or non-participation on current incentive programmes.

However, cooperatives are not immune to problems like any other entities. Problems such as that of free-rider, horizon and portfolio problems as articulated

by Ortmann & King (2007) would also be applicable to smallholder members in an emerging cooperative. Therefore, small-scale farmers wishing to engage in cooperatives need to be aware of these problems and proactively address them. Government support has been mostly supported by most researchers.

#### **5.4 Future research**

This study used cross-sectional data from a relatively smaller study area. It could be interesting if a similar study in a broader area can be done using panel data. Using panel data could provide an insight into the different levels of output in relation to credit use over a period of time. In addition, a profit or income maximizing loan amount at different levels of farm land under utilization in a specific area could easily be determined.

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## APPENDICES

### APPENDIX A: STRUCTURED QUESTIONNAIRE

UNIVERSITY OF LIMPOPO, TURFLOOP CAMPUS

DISCIPLINE: AGRICULTURAL ECONOMICS

QUESTIONNAIRE ON USE OF AGRICULTURAL CREDIT

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Name of the Interviewer: \_\_\_\_\_

Questionnaire number: \_\_\_\_\_

Survey date: \_\_\_\_\_

#### **A. INFORMATION OF THE HEAD OF HOUSEHOLD OR FARMER**

1. Farmers' age in years .....
2. Gender/Sex: male.....or female.....
3. Size of household at time of interview(excluding visitors).....
4. Adult size: Men.....; women.....; boys .....; girls.....
5. Highest level of education completed at school (indicate no. of years attended).....
6. Marital status:  
Single.....Married.....Divorced.....Widowed.....

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

**B. AGRICULTURAL PRODUCTION METHODS**

8. Size of farm land.....ha

9. Is the land sufficient for your needs?.....

10. How many people did you hire the previous year?

Fulltime.....Parttime.....

11. What were their salaries in Rands?.....

12. What irrigation method do you use?

- a. Flood
- b. Drip
- c. Spray
- d. Other (specify).....

13. How do you plough your fields?

- a. tractor
- b. oxen
- c. donkey

14. How many of the following livestock does the household have?

Type of livestock	Number/head
Cattle	
Goats	
Horses/mule	
Donkeys	



Pigs	
Poultry	
Other(specify)	

15. what is the common form of tenure system in your area

- a. certificate of occupation
- b. own land lease
- c. share cropped
- d. freehold
- e. no land rights
- f. Other (specify).....

**C. HOUSEHOLD INCOME AND ACCESS TO SUPPORT SERVICES**

16. Average farm income per year R.....

17. What additional income have you received from non-farm activities?

Source	Amount
Wages/salaries	
Remittances	
Rental payments	
Income in kind	
Pensions	
Compensation payment	
Lobola payment	

18. Have you ever borrowed money? Yes.....Or No.....

19. If yes, where did you borrow?

- a. bank
- b. money lender
- c. friends and relatives
- d. stockvel
- e. shoppers
- f. Other (specify).....

20. At what interest rate did you borrow? .....%

21. Member of farmers' association: Yes..... Or No.....

22. If yes, what is the name of the association.....

23. Have you ever been visited by an extension agent? Yes.....Or No.....

24. If yes, how many times for the whole year? (Indicate number of visits).....

25. What problems do you encounter as a farmer in this area.....  
.....

**Thanks for your valuable time!**