

**MAINSTREAMING SMALL-SCALE FARMERS IN QWAQWA, FREE STATE
PROVINCE, SOUTH AFRICA**

By

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requirements for the degree:**

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In the

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DECLARATION

I, **Thabiso Andries Benedict Koatla**, declare that the dissertation hereby submitted for the qualification of Magister Scientiae Agriculturae in Agricultural Economics at the University of the Free State is my own independent work and that I have not previously submitted the same work for a qualification at/in another university/faculty.

Signature:

Place:

Date:

DEDICATION

**This study is dedicated to my beloved grandmother Selina Ndozi Conana,
wife [Paulina Matumelo Koatla] and sons [Olerato and Oratile Koatla].**

I love you guys.

PREFACE OR ACKNOWLEDGEMENTS

*And the LORD answered me, and said, Write the vision, and make it plain upon
tables, that he may run that readeth it. (Hab. 2:2)*
I can do all things through Christ which strengtheneth me (Php. 4:13)

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Thabiso Andries Benedict Koatla

Bloemfontein, South Africa

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STATE PROVINCE, SOUTH AFRICA**

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ABSTRACT

Small-scale farming has always been heavily debated within the agricultural sector all over the world, and Qwaqwa farmers are no exceptions, because they are constantly faced by numerous challenges. Prior to the incorporation of homelands into South Africa, farmers received assistance and as a result they developed a dependency syndrome. Poor management capability, lack of farming skills, lack of information, poor quality of products, poor management and leadership skills, poor access to markets, poor infrastructure, etc. were found to be the constraining factors that contribute to the poor performance of small-scale farmers. It is therefore part of the strategy to overcome these constraints by mainstreaming small-scale farmers into the economy of South Africa. However, these farmers need to overcome many obstacles during the process of being mainstreamed into the economy.

Using primary data gathered from the small-scale farmers in Qwaqwa, this study highlights and points out issues and factors that constrain these farmers. The investigation focuses on the role that is played by both government and the private sector, and their contribution to the small-scale farming community with regard to assisting these farmers to improve their farming abilities and their

integration into the economy. The methodology applied in the study involves cluster analysis, principal component analysis and logistic regression analysis. As expected, several components have significant influence on the success of small-scale farmers, whereas others are tested as being insignificant. Those that have significant influence include production capability, financial skills, physical access to markets, optimal resource use and experience gained and scale of operation. Even though only one component was found to be insignificant, managerial skills, it is still regarded as playing a crucial and an important role in determining the success of small-scale farmers.

In conclusion, both government and private sector have a significant role to play in the development of these farmers. The study concludes that assisting small-scale farmers to improve their living standards, thereby mainstreaming them into the economy, will contribute significantly towards their farming success. It is also important that farmers liaise with media within their regions as part of accessing crucial information that will help them in achieving good results. Apart from media, farmers should also make use of other sources such as cooperatives, technical assistants (extension officers), buyers and supermarkets. These components clearly show that institutions have a crucial role to play in terms of influencing the development of farmers and assist them to achieve good results. Intervention from government will also play a crucial role. The latter observation therefore stress the need to revisit the policies and frameworks that are much talked about, but rarely implemented nor put into practice. The adoption and implementation of advanced policies is of crucial importance in supporting the small-scale farmers on the farm, as well as beyond the farm gate.

**MAINSTREAMING SMALL-SCALE FARMERS IN QWAQWA, FREE
STATE PROVINCE, SOUTH AFRICA**

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SAMEVATTING

Kleinskaal boerdery word voortdurend wêreldwyd binne die landbou sektor gedebatteer. Dit is ook die geval met die kleinskaal boere van Qwaqwa wat voortdurend talle uitdagings die hoof moet bied. In die tydperk voordat die tuislande by Suid-Afrika ingesluit is het boere deurgaans regerings-bystand gekry en gevolglik 'n afhanklikheidsindroom ontwikkel. Daar is bevind dat beperkte bestuurskapasiteit, gebrek aan boerdery vaardighede, gebrek aan inligting, swak gehalte van produkte, swak bestuurs en leierseienskappe, swak toegang tot markte, gebrekkige infrastruktuur, ens, die beperkende faktore is wat bydra tot swak prestasie van kleinskaal boerderye. Dit vorm daarom deel van die strategie om hierdie beperkings te oorkom, naamlik om die kleinboere by die hoofstroom van die Suid-Afrikaanse ekonomie te laat aansluit. Dit is egter so dat hierdie kleinboere menige struikelblok sal moet oorkom gedurende die proses om hulle by die hoofstroom ekonomie in te trek.

Deur gebruik te maak van basis data verkry van kleinskaal boere in Qwaqwa kon hierdie studie die aangeleenthede en faktore wat die boere beperk identifiseer en benedruk. Die ondersoek fokus op die rol wat beide die privaatsektor en die regering speel, asook hul bydrae tot die kleinskaal boerdery gemeenskap met

betrekking tot ondersteuning van die boere en hul integrasie in die groter landseksonomie. Die metodiek wat in die studie toegepas word behels trosontleding, hoof komponent-ontleding en logistiese regressie-ontleding. Soos te wagte kan wees sal verskeie komponente 'n betekenisvolle invloed uitoefen ten opsigte van die sukses van kleinskaal boere, terwyl ander komponente nie betekenisvol toets. Diegene wat 'n beduidende invloed sluit 'n vermoë, finansiële vaardighede, fisiese toegang tot markte, optimale gebruik van hulpbronne en ervaring opgedoen en skaal. van die operasie Selfs al het net een komponent is onbeduidend is, bestuursvaardighede, is dit nog steeds beskou as die speel 'n belangrike en 'n belangrike rol in die bepaling van die sukses van kleinskaalse boere.

Ten slotte, beide die regering en die privaatsektor het 'n betekenisvolle rol te speel in die ontwikkeling van hierdie boere. Die afleiding wat in die studie gemaak word is dat die verbetering van hierdie boere se lewenstandaarde en hul insluiting by die hoofstroom ekonomie, sal meebring dat daar 'n betekenisvolle bydrae tot hul boerdery sukses teweeg gebring word. Dit is ook belangrik dat boere met die media in hul omgewing sal saamwerk om sodoende krities belangrike inligting te bekom was sal help om goeie resultate te behaal. Afgesien van die media moet boere ook gebruik maak van ander bronne soos kooperasies, tegniese ondersteunings dienste (deur voorligtings-assistente), kopers en supermarke. Die voorafgaande faktore wys duidelik daarop dat verskillende instellings 'n belangrike rol vervul in terme van die beïnvloeding van die ontwikkeling van boere en om hulle by te staan in die bereiking van goeie resultate. Tussenkoms deur die regering sal ook 'n krities belangrike rol speel. Laasgenoemde waarneming beklemtoon ook die noodsaaklikheid vir 'n heronderzoek van beleid en raamwerke waarvoor baie gepraat word, maar wat nooit in die praktyk toegepas word nie. Die aanvaarding en implimentering van gevorderde beleidmaatreëls is van uiterste belang in die ondersteuning van kleinskaal boere binne, sowel as buite die plaasomgewing.

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LIST OF ABBREVIATIONS

AgriSA	Agriculture South Africa
AIDS	Acquired Immune Deficiency Syndrome
ANC	African National Congress
ARC	Agricultural Research Council of South Africa
DALA	Department of Agriculture and Land Affairs
DLG&H	Department of Local Government and Housing (Free State)
FAO	Food and Agricultural Organization (of the United Nations)
FSP	Free State Province
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
IFAD	International Fund for Agricultural Development
IPM	Integrated Pest Management
ISNIE	International Society for New Institutional Economics
LDCS	Least Development Countries
LS	Less Successful
LSU	Large Stock Unit
MAFISA	Micro Agricultural Financial Institutional Scheme of South Africa
M-A-P	Maluti-A-Phofung
MDBSA	Municipal Demarcation Board South Africa
MS	More Successful
NAFES	National Agricultural and Forestry Technical Assistance
NAFU-SA	National African Farmers Union of South Africa
NDA	National Department of Agriculture (South Africa)
NIE	New Institutional Economics
NP	National Party
PC	Principal Components
PCA	Principal Component Analysis
PRA	Rapid Appraisal Approach

QNP	Qwaqwa National Parks
SA	South Africa
SAFEX	South African Futures Exchange
SANDMC	South African National Disaster Management Centre
SANPARKS	South African National Parks Board
SSU	Small Stock Unit
StatsSA	Statistics South Africa
TCE	Transaction Cost Economics
UN	United Nation
WTO	World Trade Organization

CHAPTER ONE

INTRODUCTION

No economy can meet its potential if any part of its citizens is not fully integrated into all aspects of that economy.
– Thabo Mbeki (2003)

1.1 BACKGROUND

Agriculture is a key sector in all sub-Saharan economies and has been identified as one of the sectors with an immense potential to contribute significantly more to the GDP than other sectors in keeping the region afloat. Being the major source of food supply and household income in rural areas, agriculture is central to most of Africa's rural population. Hence most concerns about rural livelihoods or poverty alleviation in Africa are necessarily associated with concerns about agriculture (Magingxa, 2006).

According to the World Bank (2002), agriculture in least developed countries (LDCs) accounts for a large share of gross domestic product (GDP) (ranging from 30% to 60% in about two-thirds of those countries), while employing a large proportion of the labour force (from 40% to as much as 90% in most cases), representing a major source of foreign exchange (from 25% to as much as 95% in three-quarters of those countries), supplying the bulk of basic food and providing subsistence and other income to more than half the LDC's populations.

According to Meijerink and Roza (2007), agriculture can contribute through:

- The creation of additional employment opportunities;
- an increase in productivity and output, which will enhance the sector's contribution to national economic growth;

- an increase in the income of the poorest groups in society, through the creation of opportunities for small- and medium-scale farmers to raise their production for their own consumption and for markets; and
- an improvement in household food security through expanded production and a more equitable distribution of resources.

Agriculture also provides the basis of subsistence for the population through the production of food and raw materials. Traditionally the inhabitants of each country or region depended on the bread-basket filled by the farmers, i.e. every person was dependent on agriculture and was interested in its fate. In recent times, regional and international trade has reduced the dependence on home agriculture, and the quantity of available food is less a function of the harvest than of political decisions on the quantity of food imports (Kuhnen, 1978).

In the predominantly agricultural economies of many African countries the performance of smallholder farmers is often crucial to the performance of the economy and is a key factor in the potential for rural development and the alleviation of poverty (Chancellor, 1999). Small-scale farming in South Africa has become a major issue within the agricultural sector. After the first democratic election in 1994, the ANC-led government placed the development of small-scale farmers as a priority on their agenda. The major role players within the agricultural sector and the South African government believe in and acknowledge the importance of the role that small-scale farmers can still play within the agricultural sector.

Xingwana (2008) reiterated the fact that the Ministry for Agriculture and Land Affairs is still of the opinion that agriculture can play an important role in the development of rural areas through the establishment of small- and medium-scale emerging farmers and through the creation of opportunities to raise their production. Some benefit from the land and agrarian reform projects in the Free State. To support the statement, Lipton (1996), as cited in Magingxa, Alemu and Van Schalkwyk (2006), identified what he referred to as the four

reforms that have helped many developing countries to increase growth in farm output and employment, namely land distribution, agricultural research, rural infrastructure and markets. Apart from the reforms, Magingxa et al. (2006) support the statement by stating that labour-intensive farm growth also tends to increase nearby rural farm growth and also to improve food availability. Therefore there is a need to identify measures that can help to overcome constraints that contribute negatively towards the development or empowerment of small-scale farmers.

Looking at the contribution of institutions, one finds that the institutional environment is one of the sectors that can and does play a crucial role within the development of small-scale farmers. In previous years, during the apartheid regime, access to agriculturally related institutions was minimal for black farmers. According to Ortmann and King (2006), small-scale farmers in South Africa did not have access to the services of cooperatives and of marketing boards under the previous (apartheid) government's policies, which restricted black farmers' activities to the former homelands. According to Van Schalkwyk, Groenewald and Jooste (2003), the institutional environment in the South African agricultural sector was developed over centuries and was influenced by various factors including protectionism, colonialism, apartheid, etc. In South Africa, as a result of apartheid, black farmers were deprived of assistance from government, while white farmers were supported by legislation and subsidies. The Natives Land Act of 1913 restricted African land ownership to 14 % of the national land in the former homelands. The parts of the country previously designated 'independent homelands' and 'self-governing territories' formed the living and farming environments of the majority of the black population and featured the most extreme cases of infrastructure deficiencies. The Marketing Act of 1937 enabled the Minister of Agriculture to promulgate marketing schemes, administered by control boards.

Subsidies to white commercial farmers prior to 1994 tended to encourage inefficiency and expansion into environmentally marginal areas, and further promoted the dualistic agricultural sector. Large commercial farmers made

use of inexpensive black labour and were able to develop and utilise world-class technology, capital and machinery (Van Zyl, Kirsten and Binswanger, 1996). The consequences of the policies can still be seen today in the form of a highly dualistic agricultural sector. Black farmers still farm small areas of land in the former homelands, with inadequate institutions, market access, infrastructure, and support services. After the fall of apartheid in 1994, control boards were abolished and markets liberated and the agricultural sector had to compete in the global market. The marketing reform after 1994 meant that farmers had to start managing their own marketing functions without the protection of the past, and even well-established commercial farms have started to feel the pressure mount. This makes it difficult for smallholders to succeed despite various support efforts by government.

In this study, a case study of the small-scale farmers of Qwaqwa is used in an attempt to describe or highlight the plight of the farmers in that area. Some of the general constraints which these small-scale farmers have to deal with on a daily basis are: market access, financing, market information, transaction cost, etc. It is therefore very important that these farmers are mainstreamed into the growing South African agricultural sector. For them to be mainstreamed they have to overcome many constraints that are impacting negatively on their success.

Qwaqwa was once part of the self-governing states (homelands), which were formed by the previous apartheid regime as part of their plan to segregate people according to their languages. Qwaqwa, also known as Witsieshoek until 1969, is a small, mountainous former homeland of 655 square kilometres in size and carved out of the broader territory of South Africa (Nell, 1998). It is situated in the corner currently formed by the boundaries of the Free State, Lesotho and KwaZulu-Natal. Qwaqwa was established in 1969 and remained semi-autonomous until the new dispensation in 1994, when it was incorporated into South Africa and formed part of the Free State Province. A more detailed description of the study area will be presented in Chapter Three.

1.2 PROBLEM STATEMENT

For many years the black farmers within the former homeland states were seriously neglected, but had minor assistance from their governments and their markets were mainly in South Africa (Nell, 2009). He further stated that sometimes black farmers had difficulties in selling their products, which could not meet the quality needed by the markets. Also, since the deregulation of parastatals and the abolition of the homeland states, it has been difficult for the small-scale farmers within these regions to continue their farming practices without support services.

In the past the small-scale farmers in the study area were known for their contribution to household, local and regional food supply, but since 1994 their production levels have deteriorated (although not overnight) and they are now facing severe problems, e.g. lack of access to markets, production problems, inadequate technical assistance, lack of information, a low rate of adoption of technological measures, etc. (Nell, 2009). It is therefore the intention of this study to investigate the smallholders' main problems with regard to their institutional environment, including market access and measures that can be advocated and implemented in an effort to overcome the farming constraints in the area or that what was used to represent managerial skills was not a good proxy. It is clear that farmers in Qwaqwa need to be mainstreamed into the economy of South Africa.

According to Gumisiriza (2008), mainstreaming is not concerned with completely changing organisations' and/or the sector's core functions and responsibilities, but instead it is concerned with viewing them from a different perspective, and making alterations as appropriate. Gumisiriza further states that mainstreaming is not a one-off activity or event, but a process. Therefore the focus should be on mainstreaming farmers because their capacity and development will assist in delivering what is needed from them as farmers, and will also benefit from the mainstream economy.

On the other hand, mainstreaming of small-scale farmers can be defined as the act of broadening the application of a change or innovation from a small scale to the commercial domain. It involves recognising that the results of an experiment by small-scale farmers are positive and the learning deserves to be applied more widely. To mainstream small-scale farmers will be achieved by integrating them and processing new knowledge and good practices. Therefore for this study, mainstreaming of small-scale farmers is defined as a process of integrating small-scale farmers into the South African agricultural sector. This can be achieved by addressing all the different constraints impacting negatively on their development and also by determining how each farmer can be assisted and have a competitive advantage in the sector.

1.3 OBJECTIVES OF THE STUDY

The main objective of the study is to assist small-scale farmers of Qwaqwa to overcome constraints that they are facing thereby mainstreaming them into the economy of South Africa.

To achieve the main objective the following secondary objectives will have to be met:

- conduct a literature review of the findings of other authors regarding the problems that small-scale farmers have, and their possible solutions and recommendations;
- provide an overview of small-scale farming internationally as well as in South Africa;
- make policy recommendations that can be implemented in mainstreaming and improving the position of small-scale farmers.

1.4 RESEARCH METHODOLOGY

The methods and approaches used in this study were theoretical, analytical and descriptive in nature. Considering the specific constraints of the small-scale farmers in Qwaqwa, various methods were critically evaluated. The

primary data was collected from small-scale farmers who participated in the study and from discussions which were held with some of the key personnel within the Agricultural sector. Different methodologies were implemented with the aim of getting answers for the questions posed and achieving the objectives. Comprehensive analysis and statistics were employed to describe the characteristics of the small-scale farm sector and to present information about the dominant production practices, constraints and opportunities.

One of the procedures to gather information in this study was simple random sampling. Apart from the simple random sampling, other methods such as descriptive statistics and analysis were employed to describe the characteristics of the small-scale farmers. This was achieved by employing the following measures:

- Conducting panel discussions with role players and/or representatives of small-scale farmers;
- conducting surveys through a questionnaire to clarify issues that cannot be identified or resolved through the analysis of panel discussions;
- evaluating existing marketing structures by investigating the performance of the current marketing strategies; and finally
- making recommendations to policymakers on how to improve the institutional policy environment of small-scale farmers, as derived from the results of this study.

According to Esbensen and Geladi (2009), Principal Component Analysis (PCA) is the most fundamental, general-purpose multivariate data analysis method used. In this study a Principal Component Analysis (PCA) technique was applied to determine the impact of various constraining factors on the success of the small-scale farmers. In order to discover or to reduce the dimensionality of the data set and to identify new meaningful underlying variables, a logit regression analysis was also applied. Logit regression (logit) analysis is a uni/multivariate technique which allows for estimating the probability that an event occurs by predicting a binary dependent outcome

from a set of independent variables. Least squares were also used in assisting with the data analysis. A detailed description of each of the techniques is provided in Chapter Five.

1.5 THE IMPORTANCE OF THE RESEARCH

Small-scale farming has been associated with black farmers mostly farming in the former homelands. Their lack of sustainable and successful marketing has been caused by a lack of technology, knowledge and skills to manage their farms. On the other hand, government is trying to enhance assistance to small-scale farmers. The study will endeavour to identify the critical constraints on the successful adoption by small-scale farmers of measures to achieve success in the production and marketing of crops and livestock. The variables thus identified may strengthen the farmers' participatory role when it comes to farming success, allowing them to enjoy the support of research services and extension personnel and eventually to improve their farming activities.

This study also identifies possible measures and projects that will keep the farmers motivated to succeed and to overcome their constraints. The results, conclusions and recommendations may serve as guidelines for policymakers to improve the production skills, marketing skills and institutional participation of small-scale farmers.

1.6 CHAPTER OUTLINE OF THE STUDY

The underlying concern of the study is the identification of ways and means of mainstreaming and overcoming the constraints of small-scale farmers in Qwaqwa. The contents (chapters) of the rest of the study are structured or outlined as follows:

Chapter Two reviews the literature, focusing on what has been done by other researchers in the small-scale farming sector and also providing solutions as formulated by them.

Chapter Three focuses on the description of the study area, as well as the historical background to the small-scale farming programmes active in Qwaqwa. It also explains the reasons why Qwaqwa was chosen as the study area.

Chapter Four focuses on the characteristics of small-scale farmers' households in terms of demographics and human capital endowments.

Chapter Five presents a discussion on the methodology that will be used. It also focuses on how data was gathered and defines the variables that are analysed.

Chapter Six presents the results of the analysis.

Chapter Seven summarises the key findings and presents conclusions based on the outcomes of the study. It also makes recommendations for the development of small-scale farmers and for further research.

CHAPTER TWO

LITERATURE REVIEW

Make everything as simple as possible but not simpler.

– Albert Einstein

(1879-1955)

2.1 INTRODUCTION

It is very important to have a broader knowledge of, or perspective on small-scale farming before an attempt is made to outline the problems and/or constraints the farmers are facing in terms of farming success and market access, or to make any suggestions in that regard. Since the first democratic election in South Africa in 1994, the development and integration of small-scale farmers has been a focus of the new government's policy on agriculture (Department of Agriculture and Land Affairs (DALA), 1998). This has contributed to changes in the marketing of agricultural products and also to the deregulation and liberalisation of markets, with the purpose of assisting local producers to enter the local, regional and international markets. According to Montshwe (2006), it is evident that, since the advent of a deregulated and liberalised market economic system within the agricultural industry in South Africa, the integration of the small-scale sector into the commercial sector has been of topical interest. Therefore he recommended further studies on the issue of integrating small-scale farmers into the commercial sector.

The first section of the chapter reviews the New Institutional Economics (NIE), specifically with regard to transaction cost economics – with particular reference to its three pillars, namely property rights, economics of information (also known as technology) and social capital – and its importance for the study. The final part of the chapter focuses on both an overview and literature on the constraints on small-scale farming production and access to markets as discovered or outlined by previous researchers. The review discusses the

technical, social and economic constraints on small-scale farming. The second section focuses on the overview of small-scale farming. The third part of the literature review focuses on small-scale farming with reference to constraints in terms of marketing and market access; it also covers a broad discussion of small-scale farming, including the definitions, characteristics and classification of small-scale (smallholder) farmers. The term 'small-scale farming' has over the years been used and defined in different ways.

2.2 AN OVERVIEW OF NEW INSTITUTIONAL ECONOMICS (NIE)

Many authors have suggested that analysts should pay more attention to institutional arrangements and should accept the possibility that pure competition may not always be the most satisfactory means of ensuring market access for smallholder farmers (Dorward, Kydd and Poulton, 1998; Poulton, Kydd, Gibbon and Hanyani-Mlambo, 2004; Kydd, Dorward and Poulton 2001). Since institutions and institutional frameworks provide the incentives for efficient production and for people to engage in economic activity, an institutional analysis is required to explain why the cost of transacting is so high in developing countries. The frequent occurrence of market failure and incomplete markets because of higher transaction costs in developing countries cannot be explained by conventional neo-classical economics and requires an institutional analysis. According to Nothard, Ortmann and Meyer (2005), institutions are seen as the rules of the game that shape human interaction and which are put in place to reduce uncertainty. Therefore, NIE can be defined as a useful framework which could help determine the types of institutions needed, informal or formal, to improve economic performance in developing countries (Kherallah and Kirsten, 2001).

Literature gives a wide variety of explanations or definitions for New Institutional Economics (NIE) from different scientists and authors (e.g. Kherallah and Kirsten, 2001; Przeworski, 2004; Sartorius, Kirsten and Masuku, 2003).

New Institutional Economics (NIE) is an interdisciplinary enterprise combining economics, law, organization theory, political

science, sociology and anthropology to understand the institutions of social, political and commercial life. It borrows liberally from various social-science disciplines, but its primary language is economics. Its goal is to explain what institutions are, how they arise, what purposes they serve, how they change and how – if at all – they should be reformed. (www.isnie.org)

New Institutional Economics (NIE) is an economic perspective that attempts to extend economics by focusing on the social and legal norms and rules that underlie economic activity. Although NIE has its roots in Ronald Coase's fundamental insights about the critical role of institutional frameworks and transaction costs for economic performance, at present NIE analyses are built on a more complex set of methodological principles and criteria. According to Kirsten (2002) as cited by Van der Watt (2006), NIE is a vast and relatively multidisciplinary field that includes aspects of economics, history, sociology, political science, business organisation and law. The principal advantage is its currency, along with the fact that it captures one of the main themes that sets the ideas in question apart from the mainstream view.

A social dilemma arises when radical individualism becomes inconsistent with social welfare, namely when the choices made by rational individuals yield outcomes that are socially irrational. The core argument of the new institutionalism is that institutions provide the mechanisms whereby rational individuals can rise above social dilemmas. Non-market institutions enable individuals to escape the tensions between individuals and social rationality created by the perverse incentives that produce the failure of markets. Market failures yield social dilemmas and thereby elicit the innovation of institutions (Bates, 1998). It is believed that when a market fails to arrive at an optimum state, to some extent at least it will recognise the gap, and neither market nor social institutions will arise in attempting to bridge that gap.

As a result of the expansion of economics into other social sciences, primarily law, politics and sociology, NIE is by definition a multidisciplinary field of study comprising several branches. Fields such as the so-called new economic

history and the public choice school inform the institutional environment at the macro level, while transaction cost economics and information economics, for example, inform primarily the micro-analytical aspects of transactions and the forms of governance (Kherallah and Kirsten, 2001). According to North (1990), two important catalysts for institutional change are a change in relative prices and a change in technological innovations.

In conclusion, among the many concepts or aspects that are often taken into account in current NIE analyses, the following deserve mention: organisational arrangements, social norms, ideological values, decisive perceptions, gained control, enforcement mechanisms, assets specificity, human assets, social capital, moral hazard, contractual safeguards, surrounding uncertainty, asymmetric information, strategic behaviour, bounded rationality, opportunism, adverse selection, monitoring costs, transaction costs, credible commitments, modes of governance, persuasive abilities, incentives to collude, hierarchical structures, and bargaining strength (Figure 2.1). Finally, too often agricultural restructuring and rural development initiatives have failed to account for small-scale farmers' access to markets. NIE's prescription for market access is to get the institutional aspect right. This provides an initial point of action for farmers to overcome barriers.

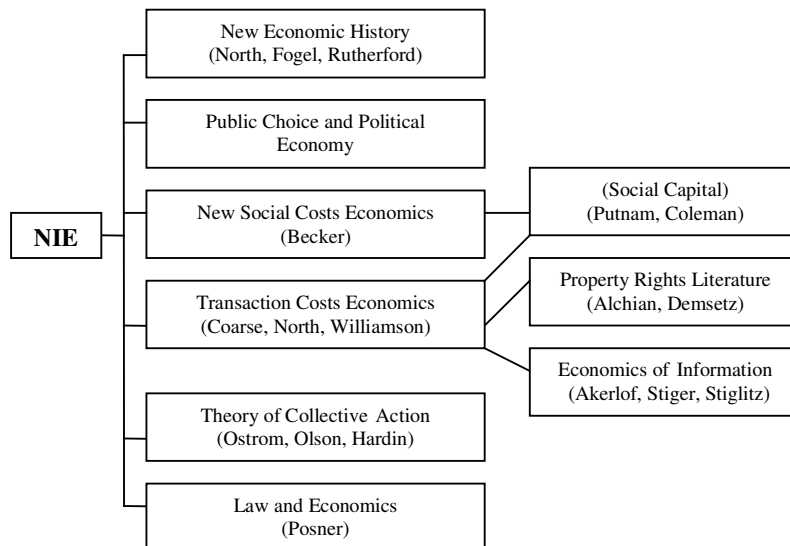


Figure 2.1: Branches of New Institutional Economics
Source: Kherallah & Kirsten (2001)

2.2.1 Transaction costs

It is not easy for small-scale farmers to survive in the agricultural sector as long as they are faced with the problem of high transaction costs. According to Randela, Alemu and Groenewald (2008), transaction costs are the embodiment of access barriers to market participation for resource-poor smallholders. They further state that they are normally defined as all costs of entering into contracts, exchange or agreement; searching for trading partners; screening potential candidates; obtaining and verifying information; bargaining; transferring the product; and monitoring, controlling and enforcing the transactions. Magingxa (2006) states that transaction costs generally refer to the costs that have to be incurred before a sale is made. He further states that the concept belongs to a host of related studies which economists call Transaction Cost Economics (TCE), and that TCE belongs to the relatively new school of thought that is referred to as New Institutional Economics (NIE), which was discussed earlier in this chapter. Williamson (1985), Nothard *et al.* (2005) and Van der Watt (2006) state that transaction costs – which include the costs of information, monitoring, coordination and enforcement of contracts, including the risk of negotiating and concluding a separate contract for each exchange transaction that takes place in the market, the distance to formal markets and contract enforcement – are detrimental to the efficient operation of markets for inputs and products.

Doss, McPeak and Barrett (2005) argue that transaction costs mean different things to different groups of people, and thus all risks have to be understood within the larger social, cultural and economic context. According to Pingali, Khwaja and Meijer (2005), there are certain difficulties hindering small-scale farmers from commercialisation which arise from a lack of public goods and which hamper market exchange, as well as the new set of transaction costs that have emerged from dealing with the food system. Again, transaction costs are simply termed as the costs of carrying out an exchange of goods or services. They arise wherever there is any form of economic organisation; in other words, in a spot market transaction between independent firms, or in contractual transactions, or between partners in a joint venture, or between

stages within a vertically integrated firm (Hobbs, 1996). Although small-scale farmers are faced with such transaction costs, the majority have no knowledge or awareness of these costs, due to a lack of education and understanding.

According to Poulton, Dorward, Kydd, Poole and Smith (1998), as cited by Magingxa (2006), the transaction costs faced by a given individual depend on his or her location, knowledge, social status and even wealth endowment. The opportunity cost of a given resource or item thus differs from individual to individual, and it no longer makes sense to talk of a single set of prices whereby price and opportunity cost are equalised and welfare maximised (Poulton *et al.*, 1998). Ortmann and King (2007) state that, clearly, high transaction costs in the production and marketing of otherwise profitable commodities often exclude small-scale farmers from participating in growth opportunities. The empirical study by Matungul *et al.* (2001), as cited by Ortmann and King (2007), supports the hypothesis that transaction costs are a primary determinant of household crop income; i.e. households facing lower transaction costs generate higher levels of crop income. In addition to public investments in improved physical infrastructure (e.g. roads, telecommunications), institutional infrastructure (e.g. land rental markets, marketing associations, contract enforcement) is critical for lowering transaction costs for households, which could stimulate their production and marketing activities.

According to Hobbs (1996), transaction costs can be divided into three main classifications that relate to different stages of the transaction, namely:

- Information costs: These arise prior to the transaction and are the costs of gathering information on products, prices, suppliers and customers.
- Negotiation costs: These arise from the physical act of the transaction, such as the cost of employing procurement or sales staff, the cost of writing contracts, commission charges if an agent is used, etc.
- Monitoring costs: These arise after the transaction has been negotiated and are the costs of ensuring that the terms of the transaction are

adhered to by the other party. It may be necessary to monitor the quality of goods from a supplier or to monitor the behaviour of a supplier (or buyer). The information costs that arise from identifying new suppliers have already been mentioned. Ensuring that products continue to be of a consistent quality will also be of importance to the retailer. This involves the retailer in an ongoing process of monitoring both the quality of the products and the processing practices of the supplier.

Nell (1998) states that the cost of credit, and the relatively high transaction costs of production loans obtained through the South African Land Bank to acquire new technologies in crop and livestock production, are also a problem. According to Furubotn (2001), observation of actual economic activity suggests that positive transaction costs are ubiquitous and unavoidable and that human decision-makers are, by their inherent nature, quite limited in their ability to acquire, store, retrieve and process information. Therefore more needs to be done to improve production, reduce transaction costs and increase market access to ensure growth within the sector (Van Rooyen and Tui, 2009).

2.2.1.1 Property rights

A property right is the exclusive authority to determine how a resource is used, whether that resource is owned by government or by individuals (Alchian, 2007). According to Demsetz (1967), as cited by Ortmann and King (2007), property rights are defined as the capacity to use, or to control the use of an asset or resource. Demsetz maintains that for any form of human cooperation to be feasible, especially a form involving agreement, it requires clearly defined and enforced property rights. According to Allen (1991), an economic property right is one's ability, without penalty, to exercise a choice over goods, a service or a person. He goes on to state that it is important to note that the definition is from an individual's perspective, since it is the extent of that person's property right. Property rights vary from an authorised user, to claimant, to proprietor and to owner (Balyamujura, 1995). Balyamujura goes

further to say that different regimes of property rights exist, namely: open access, common property, private property and state property. Each of these property regimes has a particular influence on the economic incentives that will be experienced by each of the holders of these regimes and each has externalities, both positive and negative, peculiar to it.

In this study, the term 'property rights' is used to refer to a claim to the use or control of resources that is recognised as legitimate by an entity or entities larger than the individual, and the social and/or legal mechanisms that define and protect those claims. The key elements of land or property rights are therefore: the claims to use or control the resource stock, veld or animal grazing; the individuals and groups that make those claims; the statutory and non-statutory entities that support those claims; and the institutions that define and protect those claims and enforce duties on others.

According to Tietenburg (1994), as cited by Behera and Engel (2006), the manner in which people use environmental resources depends on the property rights governing the resources. That support the argument that poor production, which leads to lack of market access, is due to problems related to land ownership. Nell (1998) shared this view and stated that poor property rights and inefficient price signals discourage farmers throughout the developing world from adopting land conservation measures or technologies that are essential for sustainable agricultural development.

2.2.1.2 Information and communication

Communication is one of those human activities that everyone recognises but few can define satisfactorily. Communication is a facet of human behaviour, and as such exhibits all the complexities and multidimensionality inherent in man. It is a fundamental component of social behaviour – the transmission of information (messages) between a sender and a receiver using any of the five senses. Language is a form of communication specific to humans. (www.csa.com/hottopics/ebonics/gloss.php). Wolf (1997) states that: 'Superior knowledge and information will be the cornerstone for success – it will enable

the producer to obtain the physical resources of land, labour and capital and combine them in an efficient manner. Also, knowledge and information about a broader and more complex set of issues, for example environmental and ecosystem dimensions of farming as well as production for profitable and socially responsible farm operations will lead the farmer to success.'

It is evident that without clear levels of communication within the agricultural sector, nobody will ever benefit. Again it can be said that information-system data includes any necessary and important information that will be a benefit for the sellers and producers. An information system includes not only a data system but also the analytical and other capabilities necessary to interpret data (Bonnen, 1975) (as shown in Figure 2.2 below).

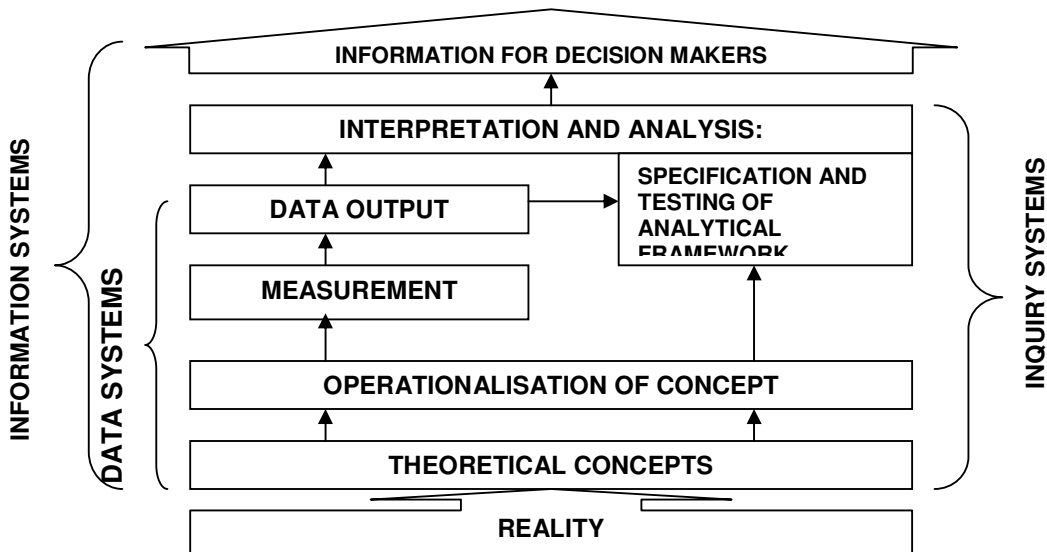


Figure 2.2: An agricultural information system

Source: Bonnen (1975)

The figure above clearly indicates the simple way in which information can be circulated in the best interests of all those involved in agricultural activities or production. According to Xingwana (2007), marketing information is an intelligent and competitive tool in the marketplace. Again, market information is also crucial to enable farmers and traders to make informed decisions about what to grow, when to harvest, to which markets produce should be sent, and whether or not produce should be stored (FAO, 2007). Mentani (2007) states that the inability to access agricultural marketing information has

denied most emerging farmers the opportunity to effectively plan and market their produce. He goes on to say that, furthermore, a lack of access to market information is one of the factors contributing to the slow development of market opportunities, and as a result the majority of emerging farmers are still trapped in a vicious cycle of poverty characterised by low economic returns. Van Renen (1997) states that lack of information, lack of auctions and long distance to market may block farmers' aspirations to sell agricultural commodities. All these facts clearly show that lack of information does hamper the success and profitability of those involved in agriculture, irrespective of how they are involved.

According to Van Schalkwyk *et al.* (2003), marketing boards played an important role in the collection and dissemination of agricultural data. Their abolition caused the supply of data to decrease and in some cases to be discontinued, despite a substantial increase in the need for data by decision-makers. The next two points (technical assistance and credit access) can also be seen or regarded as institutional factors.

2.2.2 Technical assistance

Technical assistance provided by technical assistants (formerly known as extension officers) plays a very important role in the success of the farmers at large, irrespective of whether they are large-scale, commercial or small-scale farmers. Agricultural extension was once known as the application of scientific research and new knowledge to agricultural practices through farmer education. In terms of the Strategic Plan for South African Agriculture, agriculture remains an important sector in the South African economy. The core focus of the Plan is 'to generate equitable access and participation' to contribute to a 'better life for all'. The Plan identifies five broad challenges:

- Constrained global competitiveness and low profitability;
- skewed participation;
- low investor confidence in agriculture;

- inadequate, ineffective and inefficient support and delivery systems; and
- poor and unsustainable management of natural resources.

Terblanche (2005) mentioned that participation and delivery feature clearly as challenges that needs to be addressed. Above that the extension visits or the availability of technical assistance is perhaps the single variable that has emerged significantly in most of the research done on farm efficiency and the transfer and adoption of technology (Bekele, 2003).

In conclusion, any particular extension system can be described in terms of how communication takes place as well as why it takes place. It is not the case that paternalistic systems are always persuasive, nor is it the case that participatory projects are necessarily educational. Instead there are four possible combinations, each of which represents a different extension paradigm, as follows:

- Technology transfer: This involves a top-down approach that delivers specific recommendations to farmers about the practices they should adopt.
- Advisory work: This paradigm can be seen today where government organisations or private consulting companies respond to farmers' enquiries with technical prescriptions.
- Human resource development: This particular system continues today in the outreach activities of colleges and universities around the world that provide training to rural people who cannot afford to attend full-time courses.
- Facilitation for empowerment: This approach involves methods such as experiential learning and farmer-to-farmer exchanges (NAFES, 2005).

Agricultural extension in South Africa will remain an important aspect within the agricultural sector, especially in light of the fact that the country has an estimated total of 240 000 small-scale farmers (Ortmann and Machete, 2003), the majority of whom are illiterate.

2.2.3 Credit access

Credit plays a major role in the success of any type of business, especially the agricultural sector. Credit is a very important component in the modernisation of agricultural activities (Asiedu and Fosu, 2008). Adebayo and Adeola (2008) state that credit is crucial for agricultural production and that development can also be appraised from the perspective of the quantity of problems emanating from the lack of it. According to Abedullah, Mahmood, Khalid and Kouser (2009) credit is the backbone of any business, and more so for agriculture, which has traditionally been a non-monetary activity for the rural population. Agricultural credit is an integral part of the process of the modernisation of agriculture and the commercialisation of the rural economy. In emphasising the importance of credit, Cistulli (2002) states that severely restricted access to credit, together with insecure property rights, have led to widespread selling of land by former land-reform beneficiaries in Nicaragua – often at prices way below the productive value of the land. Bekele (2003) refers to Pinstруп-Andersen and Pandya-Lorch, who concluded that there is an urgent need for effective credit and savings institutions in rural areas, to enable small-scale farmers and emerging farmers to invest in new modern technologies and sustainable agricultural intensification.

It is estimated that approximately 30% of South Africa's 19 500 formal retail outlets, where a client can enter into a loan or savings transaction, are in rural areas (outside major metropolitan areas) (Coetzee, 2003). This could be a true reflection of the facts; in fact it is not easy for small-scale farmers to access credit due to a lack of collateral, performing accounts, etc. All the difficulties plaguing market access have prompted the South African government to establish a micro-lending institute to see to the financial needs of small-scale farmers. That in turn led to the establishment of the Micro Agricultural Financial Institutional Scheme of South Africa (MAFISA) by the National Department of Agriculture in 2006. Government's desire to establish MAFISA was driven by the following policy objectives:

- To re-establish an agricultural credit scheme through the Department of Agriculture (DoA), targeting the micro- and small agricultural and related businesses; and
- to provide capital to improve agricultural and other forms of activity.

However, challenges are being experienced with the implementation of the scheme, mainly due to a lack of capacity and a lack of economic and/or financial experience in provincial departments (NDA, 2007a). The vision is to empower micro-level producers, processors, the working poor, micro-entrepreneurs and emerging farmers who are active within the agricultural sector in the rural and peri-urban areas, to enable them to embark on self-help initiatives so as to improve their livelihoods, reduce poverty, develop viable businesses and graduate into larger commercial businesses (MAFISA, 2005). Within the small-scale farming sector it is common knowledge that some farmers do not use the available financial services for banking purposes, but rather only to borrow money. To them it is important to spend their income taking care of their families. But the present use of banking and financial services by small- and microenterprises (including small-scale farmers) is very limited, with a tiny section of the market – estimated at less than 1% – presently being reached (Coetzee, 2003). This gap of credit needs to be bridged in order to secure balanced growth, ensuring higher deployment of credit for agriculture and particularly increased investment credit to cater to the demand unleashed by changing trends in agriculture post reforms period (Panthary, 2006).

2.3 AN OVERVIEW OF SMALL-SCALE FARMING

The term ‘small-scale farming’ has been used in different ways by different authors and researchers within the agricultural sector, but overall their definitions have similar meanings. It has been many years since a classification of farmers has been done in South Africa and there is a certain stigma attached to such classification. The term ‘small-scale farmer’ has caused uproar within the agricultural industry. Some believe that the

classification is based on racial issues, while some believe it is based on an individual producer's or farmer's production output. Agriculture in South Africa is divided into two broad categories, namely small-scale or subsistence farming and commercial farming. Generally the black farmers are referred to as subsistence or small-scale farmers, while the white farmers are known as commercial farmers.

Kirsten and Van Zyl (1998) mentioned that such generalisations are a misrepresentation of the facts. For example, the land area per farm of almost 25% of all farms in the 'white' commercial sector is smaller than 200 ha, and of almost 5% it is less than 10 ha, and, while these farms are small, they are considered to be commercial, even though they make a minor contribution to South Africa's total gross farm income. These authors go on to quote Lund (1993) and Lund and Prince (1998) in highlighting the problem of how to define farm size categories, illustrating that any proposed method of classification of farm sizes can be problematic:

There is no generally accepted measure of firm economic literature to guide the choice in the specifically agricultural context. Various measures of output, sales or turnover; of inputs, both flow or stock based (e.g. number of employees or value of fixed capital), and of the incomes (accruing or capitalised) of a company's equity holders have been used in different contexts. Moreover the most obvious measure in the agricultural context, land area, may be a poor economic measure of farm size since land is so variable in its agricultural attributes and farms of different types can require vastly different areas of land for the same value of output. The possibility of weighting land areas on the basis of a land (quality) classification system could be considered, but would raise problems including the attribution of weights.

These types of statements clearly indicate that the term 'small-scale farmer' has mostly been defined in a way best suited to a particular purpose. The authors mentioned above define the concept of the small-scale farmer mostly

in terms of total output, operations, race, size of farm, total contribution to the agricultural sector, etc.

This negative perception of the definition of a small scale-farmer will continue, and the term will be defined in different ways to suit the needs of those researching or writing about small-scale farming. Kirsten and Van Zyl (1998) concluded that the concept of the small-scale farmer should not be value-laden and viewed in a negative light. Small-scale farmers need not be backward, non-productive, non-commercial and subsistence-oriented, as is still the case in some parts of the former homeland areas (Kirsten & Van Zyl, 1998). It is therefore the task of the agricultural economics profession in South Africa to do away with the negative image of smallholder agriculture and to accept the importance of the New Institutional Economics theory as a tool to identify the constraints facing smallholders.

2.4 MARKETING AND MARKET ACCESS FOR SMALL-SCALE FARMERS

Marketing describes all those activities that accelerate the movement of goods or services from the manufacturer to the consumer. In other words it means those activities related to advertising, distribution, merchandising, product planning, promotion, publicity, research and development, sales, transportation, and warehousing of goods or services. Cant and Machado (1999) mentioned that the term 'marketing' has been used to describe the important elements of a marketing programme or the so-called four Ps, where such a programme can be broadly seen to perform the following tasks:

- identifying opportunities and threats in the marketing elements;
- deciding on the products to be produced in order to satisfy consumer needs;
- deciding on the selling price of the product in order to achieve the profitability objective; and
- choosing a specific target market.

The four Ps of marketing can be described as the product policy (the products or services being offered and whether they are unique, superior and easier to use), the price policy (how much the product is sold for, based on the producer's cost and its value to potential customers), the promotion policy (communicating with potential customers to create awareness of the business and product offered), and the place policy (location of the business and the product distribution methods). Beckman and Davidson (1962) and Marx and Van der Walt (1989), cited by Mdaka and Heisohn (1996), define marketing as a combination of dynamic management tasks and decisions directed at determining and satisfying the needs of markets, offering products and services to consumers in such a manner that the objectives of the enterprise, consumers and society are realised. Kotler (2000) defines marketing as a societal process whereby individuals and groups obtain what they need and want through creating, offering and freely exchanging products and services of value. The marketing situation in South Africa's small-scale irrigation sub-sector exhibits a number of diverging issues (Magingxa, 2006); for most of the smallholders in South Africa, access to good road networks might not be the only problem. One of the main problems is that small-scale farmers have been subsistence-oriented and tend to be located far from market centres, and consequently often do not know or understand the requirements of the market.

The question of market access is of crucial importance for Africa. African countries have continued to put emphasis on this question since the establishment of the World Trade Organization (WTO), in which African countries are playing an increasingly dynamic role. The question of market access is especially crucial for their development agenda, which is attributable to the restricted nature of African markets and to the need for the continent to open up to export markets in order to support growth dynamics and efforts to diversify production structures (Hammouda, Karingji, Oulmane, Lang and Jallab, 2006). This has led to many studies being conducted around the world. Magingxa (2006) states that research and development initiatives relating to smallholder market access have been conducted by various institutions and scholars in Africa and other parts of the world, and have gained considerable

momentum in the twenty-first century. According to him, there seems to be a general view that market access is one of the critical factors that determine the success of smallholder farming projects, and this is an acceptable view even among professionals working in developing countries.

Makhura and Mokoena (2003) emphasise the issue of market access, stating that it is regarded as the ability of farmers to use agricultural markets to buy inputs and to sell their product surpluses; it assumes market availability. They further state that the access for small-scale farmers to fresh produce markets, livestock markets such as auctions, and grain markets is still limited. Therefore the above discussions and findings do not differ much from that of the International Fund for Agricultural Development (IFAD, 2003), which defines or considers market access according to three dimensions:

- Physical access to markets: Distance to markets, the lack of roads to reach them (or roads that are impassable at certain times of the year) and transport costs (combined with storage constraints) restrict opportunities for income generation.
- Market structure: Rural markets are characterised by extreme asymmetry of relations between, on the one hand, large numbers of small producers/consumers, and on the other a few market intermediaries. Such market relations are characteristically uncompetitive, unpredictable and highly inequitable.
- Lack of skills, organisation and information: In their participation in agricultural markets, poor producers find themselves at a major disadvantage. Many have a poor understanding of the market, how it works and why prices fluctuate; they have little or no information on market conditions, prices and the quality of goods; they lack the collective organisation that can give them the power they require to interact on equal terms with other, generally larger and stronger, market intermediaries; and they have no experience of market negotiation and little appreciation of their own capacity to influence the terms and conditions upon which they trade.

South Africa is no exception to this reality and therefore market access for the rural poor remains a critical factor in improving household food security and living standards for the rural poor (Magingxa, 2006). Van Renen (1997) mentions that South Africa cannot afford to lose the agricultural production potential of the land under the control of small-scale farmers. Therefore this sector has to be encouraged to stay in production and to make their contribution to the welfare of the country as a whole. At present they are experiencing several constraints on market access as commercialisation of this sector takes place. Magingxa (2006) concludes the topic by saying it is increasingly being recognised that the important step in market access for producers in developing countries may be to any non-traditional markets, not necessarily to foreign markets. He further states that, similarly, the analysis of how trade influences development has changed its focus from manufacturing to all non-traditional exports. There are of course many other factors that influence the ability of small-scale farmers to access markets, i.e. distance to market, their economies of scale, the quality and quantity of their products, the type of products they provide, etc. These obstacles need to be overcome before access to markets can be easy for small-scale farmers. In the section that follows, more factors that influence and/or constrain small-scale farmers from accessing markets will be discussed.

2.4.1 Constraints on marketing and market access

Different constraints on market access within the agricultural sector, especially those highlighted by small-scale farmers, have been identified by different authors and researchers. Some of the constraints identified are similar, while others differ in their identification and documentation by researchers from different backgrounds. The South African National Department of Agriculture (NDA, 2007b) states that:

“In South Africa, very few small-scale farmers participate actively in the mainstream agricultural markets. This state of affairs has called for the need for reforms if participation by small-scale cattle farmers in the commercial agricultural markets is to be enhanced. Market

access is indeed the bane of small-scale farmers' performance in the agricultural sector".

Access to markets for the small-scale farmers in South Africa is limited and also determined by a large number of factors. In addition, most of the literature on small-scale farming, e.g. Van Renen (1997), Jordaan and Jooste (2000), Sartorius and Kirsten (2002), Bates and Sokhela (2003), Makhura and Mokoena (2003), Mwangi (2003) and Montshwe (2006), reiterates that marketing and market access is linked to the following constraints, viz.:

- high loan interest rates, which lead to requests for grant funding,
- poor condition of roads leading to farmers' fields,
- poor transport access,
- inadequate veterinary support,
- poor technical assistance and infrastructure,
- poor management,
- lack of knowledge and skills on certain marketing functions, e.g. packaging and grading, very small quantities produced,
- lack of short term storage facilities such as cool storage for fresh produce,
- lack of, or inappropriate location for long term storage facilities, e.g. silos, insufficient contractual services for ploughing and harvesting,
- lack of bargaining power,
- lack of sufficient production capital and high start-up costs,
- lack of institutional support and stock theft,
- poor market and communication infrastructure, and
- carry-over of debts.

Problems and constraints related to small-scale farmers have been a topic of discussion for some time; therefore it will be impossible to highlight and discuss all of them in this chapter. According to Mdaka and Heisohn (1996), the marketing of small-scale farmers' produce has been fraught with difficulties despite the concerted efforts of government, meaning that there is a need for all people involved in the sector to assist small-scale farmers so

that they can improve their production qualities. Van Schalkwyk *et al.* (2003) emphasise that the marketing services for these small-scale farmers are often poor and sometimes non-existent, as are roads and telecommunications, physical marketing infrastructure and financial services. They state that large areas of the country can expect no development whatsoever and no upliftment of the rural poor can occur in the absence of significant improvements to the marketing set-up serving these areas and people. In terms of quality Van Renen (1997) states that it suffers as a result of less than optimal production infrastructure (e.g. irrigation systems) and a lack of suitable storage facilities. Van Renen further states that an issue of serious concern is discrimination against small-scale farmers by the traditionally commercial farm owned co-operatives.

The study by Makhura and Kirsten (2000) presents analysis on factors that affect market access for small-scale farmers. The results provide evidence that ownership of land and vehicles, the use of hired labour and access to market information are associated with participation in the market. Van Renen (1997) also emphasises the fact that small-scale farmers do not have satisfactory access to market information. Finally, one of the negative impacts that can be regarded as a growing threat to the agricultural sector is the problem of crime and farm murders. High and improved farm productivity and successful farming will be difficult to achieve in the absence of improved law enforcement in rural areas. Stock theft is also threatening the agricultural sector. These points are also set out as part of the recommendations with a view to further research. Some of the above-mentioned constraints and similar factors are discussed in detail in the sections to follow.

2.5 OTHER CONSTRAINTS FACED BY SMALL-SCALE FARMERS

2.5.1 Technology

From the general concepts of technology there emerge more specific concepts reflecting specific disciplines. Ayichi (1995) sees technology as processes, steps and techniques applied in agricultural production, storage,

processing, marketing and management. Similarly, the World Bank (1991) defines technology as any practice which tends to reduce farmers' risk in order to raise the output of and income from crops.

Doss (2006) states that one important way to increase agricultural productivity is through the introduction of improved agricultural technologies and management systems. But several academic studies have cited credit constraints as a key barrier to technology adoption by resource-poor farmers in low-income countries. According to Eswaran and Kotwal (1989), sub-Saharan Africa in particular is characterised by underdeveloped rural credit markets. This poses a major challenge to agricultural productivity as credit (needed to finance either intermediate inputs or fixed capital) is a crucial determinant of growth and technological innovation. Gilimani (2005) stated that much of the technology of smallholders is inadequate, largely because researchers are not informed of the problems actually experienced by smallholders in their daily activities. He further state this is compounded by poor technology transfer due to limited access to production assets, poor information transfer and the uncoordinated efforts of differing agencies. It has also been noted by Suppadit, Phumkokrat and Pongsuk (2006), when assessing the adoption of good agricultural practices that inadequate technology may result in poor efficiency in the farming of beef cattle. Feder, Just and Zilberman (1985) concluded the topic by listing a few factors that have been frequently identified as being influential in determining the adoption of an agricultural innovation. These include farm size, risk exposure and capacity to bear risks, human capital, labour availability, credit constraint, tenure, and access to commodity markets.

2.5.2 Management and leadership skills

Management and leadership skills are based on the contribution, knowledge and leadership of farmers with regard to farming activities. Machete, Mollel, Ayisi, Mashatola, Anim and Vanasche (2004) identified limited knowledge and lack of skills in crop production among farmers as one of the constraints on improved productivity in smallholder irrigation schemes. Therefore farmers

need to be equipped with these skills so that they can improve their farming businesses and by doing that they will also improve their livelihoods.

2.5.3 Business leadership

The men being the decision-makers in agricultural businesses, even though most of the time they are not present, hampers the success of their agricultural businesses. Akeredolu (2008) mentioned that it is important to note the participation of women and the role they play at national level as leaders and decision-makers in the agricultural sector. Involving women will perhaps help to improve production.

2.5.4 Storage facilities

Storage is an important aspect of food security in developing countries. This is especially important since most cereals, including maize, are produced on a seasonal basis, and in many places there is only one harvest a year, which itself may be subject to failure (Proctor, 1994). Despite the realisation of the importance of storage, the persisting financial stress and poor knowledge impact negatively or undermine the success of small-scale farmers, especially in sub-Saharan Africa. Gilimani (2005) highlights the issue again by stating that smallholder farmers depend on erratic rain-fed agriculture and are therefore severely affected by shortages. Water storage and reticulation is important in supporting various aspects of farming including crop irrigation and livestock support.

2.5.5 Technical constraints

Pote and Obi (2007) state that technical constraints can be further divided into different factors such as inadequate infrastructure, distance to markets, access to inputs, the lack of economies of scale, extension services and a general lack of skills and experience. Other technical constraints, according to Magreta, Magombo and Zingore (2010), are government policies: current analysis of government policies shows that many governments adopt policies

that aim at maximising social welfare, which enable them to stay in power, and policies that respond to private demands and not social interests. They further state that most of the policies tend to be antithetical to the interests of farmers and this is evidenced by the way governments respond to the needs of people staying in the rural as well as the urban sectors.

2.5.6 Education

In agriculture, farmers with higher education have better access to information and knowledge that are beneficial to farming operations, and they also tend to possess a greater ability to analyse the information and knowledge necessary to successfully implement new technology and realise expected results (Uematsu and Mishra, 2010). Educational attainment by the household head could lead to awareness of the possible advantages of modernising agriculture by means of technological inputs; it would enable them to read instructions on fertilizer packs and would lead to the diversification of household incomes which, in turn, would enhance the households' food supply (Najafi, 2003).

2.5.7 Theft

Theft is a problem that small-scale farmers face and this sometimes discourages small-scale farming. The FAO (2004) highlights the high levels of theft from fields in many countries, which prompt farmers to harvest crops before full maturity and in order to avoid theft. Within this context, there is a growing view that most smallholders do not have a viable future in farming, and that agricultural development should now focus on large and commercially oriented farms that can be successfully linked to the new types of market chain (Diao, Hazell, Resnick and Thurlow, 2007).

2.6 POSSIBLE SOLUTIONS PROPOSED

To overcome the challenges and constraints that small-scale farmers are facing, several measures can be put into place. Montshwe (2006) observed

that many of the challenges fall beyond the scope of direct intervention by the small-scale cattle farmers themselves and require interventions by government and the private sector. It is important that small-scale cattle farmers identify those areas where they could have a direct impact and engage in serious efforts to address such challenges. He further states that the problem is that many of the challenges that can be addressed directly are dependent on those challenges that must first be addressed by government and the private sector. Hence, organised agriculture, government and the private sector should take a holistic and integrated view of the development challenges faced by small-scale cattle producers if any development programmes are to achieve any significant successes.

Literature suggests an institutional approach to addressing the problems of smallholder market access, and if it is true that markets and improved market access are of critical and immediate importance to rural poor households, it is also evident that they are a prerequisite for enhancing agriculture-based economic growth and increasing rural incomes in the medium term (Magingxa, 2006). He goes further to say that rural incomes will not be substantially increased by an exclusive emphasis on subsistence food crop production; rather more market-oriented production systems are needed, and these require the intensification of agricultural production systems, increased commercialisation and specialisation in higher-value crops.

Transportation costs have also been found to be a constraining factor for small-scale farmers. Special attention must be given to the development of a functional road and transport network in Qwaqwa (Nell, 1998). This is essential in order to reduce the transaction costs of input and output, the supply of services and information flow about new technologies. Apart from the issue of transportation costs, farmers are also faced with high debts that they can't afford to repay. Lerman (2008) noticed that the optimal approach to resolving farm debt should probably include the following set of actions:

- the creation of an incentive system and a macro-policy framework for agriculture that allows efficient agricultural producers to make profits and to invest;

- a one-off process of expedited debt settlement conditional on genuine internal restructuring and privatisation of the farms participating in the debt-settlement program;
- the creation of the economic conditions necessary for the recovery of the restructured farms emerging from the debt-settlement procedure; and
- the implementation of a working bankruptcy system that will prevent the accumulation of new debt in farms created through the process of restructuring and debt settlement.

The training of farmers around rural communities is also seen as an advantage for their development. According to Montshwe (2006), the training of small-scale cattle farmers is an important aspect of the commercialisation of the small-scale sector. With adequate training in the utilisation of scientific and research methods for the identification of local community advantages and disadvantages, as well as for priorities, determination and strategic plans, and creation, representatives of local communities will be able to contribute to better and faster development, as well as to a higher quality life in their own rural areas (Subic, Vasiljevic and Ivanovic, 2009). The diffusion of new and adapted technologies capable of generating technical and financial incentives is essential, therefore the development of training programmes for farmers, to assist them in improving their farm management skills and farming efficiency, as well as the correct usage and management of livestock veterinary technologies, must also be considered (Nell, 1998).

Extension officers are expected to lead and provide farmers with accurate information and to assist them in achieving their goals. But in the current situation, extension officers are unable to deliver what is expected from them. This challenge is exacerbated by the fact that the extension officers do not have adequate background and/or understanding of business management and knowledge of economic/market intelligence. It is recommended that, as a way of increasing the participation of the small-scale cattle farmers in the mainstream markets, extension officers undergo a programme that entails the

revitalisation of skills and new skills development, particularly in the area of marketing (Montshwe, 2006).

In most studies it has been found that some farmers fail to achieve good results for their businesses due to poor working relationships amongst themselves. Randela (2005) found out that a collective action has an additional advantage of spreading fixed transaction costs, and this variable is expected to impact positively on market participation. He further states that cooperation with white commercial farmers lowers transaction costs as it enhances opportunities for information sharing, and white commercial farmers have access to services and profitable markets; this is a valuable resource that can promote market participation. Formal market outlets could be set up close to rural farms, improving the farmers' access to markets; one way of achieving this is to invite the private sector to establish processing factories and offering them incentives such as tax rebates (Ouma, Obare and Staal, 2003).

Poor soil management has been found to be a constraining factor amongst the farming communities. To achieve effective soil management, much more attention from farmers, and general concern from government, should be given to the sustainability of soil (using available and affordable management resources by farmers) and to the creation of good environmental policies (by government); this is because for many years soils in most parts of the world have been affected by problems relating to soil quality depletion (Usman, 2011). This is due to land degradation factors such as erosion (wind and water), desertification as a result of poor vegetation cover, and human-induced activities such as destroying forests (deforestation).

Public investment in rural infrastructure – power, roads, the cold-storage chain, etc. – has to be increased, since most of the problems faced by the farmers are production and quality related, and not marketing related (Singh 2005). Omiti, Otieno, Nyanamba and McCullough (2009) suggested two sets of policy interventions: First, it is necessary to upgrade farm-to-market roads and to establish more and better-equipped retail market centres in the

villages, in order to reduce transport costs and to encourage rural farmers to produce and trade in high-value commodities (such as milk). A second strategy would be to promote the formation of rural information bureaus alongside the mobile telephony systems that are already being piloted by some institutions. They further state that such interventions could enhance farmers' supply response to market dynamics for households in various socio-economic profiles and village categories. Also it is often claimed that once the required infrastructure (roads, market facilities, and so on) has been put in place, it should be enough to encourage farmers and traders to engage in agribusiness. Such favourable conditions would lead to simultaneous efforts to improve integration through institutional reforms, and to gain market access by building sustainable and predictable linkages to urban markets. Efforts towards this end would include group marketing arrangements to bring down transaction costs, to bargain for better prices, to enforce farmer-trader contracts and to explore other opportunities inherent in economies of scale and scope (Omiti *et al.*, 2009); and soft infrastructural investment, especially in education, is also vital in increasing the productivity of farmers (Randela, 2005).

To conclude, Cabrera (1999) proposed the following nine major extension programmes as part of the solution to farmers' constraints:

- Traditional crop management by applying pest control, fertiliser application, weed control, and pesticide application to traditional crops;
- The adoption of new or improved crops: New crops with some economic advantage, when compared to traditional crops;
- Credit and land ownership: Farmers must know how to obtain credit. In addition, they need to understand the relationship between land credit and ownership.
- Commercial marketing: Farmers need to analyse marketing elements to make wiser decisions in order to obtain higher incomes.
- Farm management: Farmers need to follow a sequential, orderly production process based upon decisions made from clear and

accurate records. The farmers must generate such data through record keeping and budgeting.

- Legal issues: Small farmers need to know about agricultural policies and tax law.
- Farming associations: Small farmers need to know how to organise themselves into associations in order to work towards common goals such as the advantage of purchasing products by scale, labour efficiency, diffusion of information and optimisation of financial resources. One critical goal of the associations should be to decrease crime related to the theft of crops and assets.
- Healthy diets: There is a need to modify the diets of small farmers to include more farm-raised products; and
- Pesticide use and environmental conservation: Farmers need to decrease their dependence upon chemical pesticides and incorporate Integrated Pest Management (IPM) practices.

2.7 RATIONALE FOR METHODOLOGIES USED

Without regard to specific details or exceptions, the first and foremost starting point when conducting a study is usually the issue of how big a sample is needed and what model or methodology to apply. According to Montshwe (2006), sampling involves the determination of the sample size giving due cognisance to the fact that it should be representative enough to conduct reliable statistical analysis. He further states that sample size depends largely on the degree to which the sample population approximates the characteristics and qualities resident in the general population, and the manner in which the sample units are selected is very important. This means representativeness and adequacy should be taken into consideration when generalising from the sample to the larger population, i.e. the sample is used to make inferences to a universe (Montshwe, 2006). It is difficult to give precise rules on what sample size is suitable and the suitable sample does not depend on the size of the population nor does it have to include a minimum percentage of that population (Randela, 2005). Randela further

points out that a very important issue in sampling is to determine the most adequate size of the sample. The major criterion to use when deciding on the sample size is the extent to which the sample's size is representative of the population. There are several methods for drawing a sample, different goals, and different situations that require different sampling designs. The most basic sampling procedures are simple random sampling with and without replacement (Antal and Tille, 2011).

On the issue of methodologies Magingxa (2006) states that the choice of methodology depends on the purpose of the study and the desired form of outcome(s), and these concern the choice between qualitative and quantitative methodologies.

The New Institutional Economics approach attempts to address the shortcomings of the above-mentioned approaches. New Institutional Economics (NIE) was developed as a result of the flaws of neoclassical economics, which is largely based on the assumption of perfect competition (Randela, 2005). He goes further to say that the basic underlying assumption of neoclassical economics is that exchange is a frictionless and a costless process, and it contends that where costs exist, these are passive and therefore not important. In addition, neoclassical economics provides the theoretical underpinning of structural adjustment and assumes that exchange arises spontaneously from the atomistic interaction of self-seeking individuals. In essence, neoclassical economics relies on the universal concepts of supply and demand.

At first, principal components are most likely to be regarded by non-mathematicians as a highly arbitrary set of manipulations and such a reaction should be dismissed as soon as the geometrical meaning is considered. Principal Component Analysis (PCA) merely leads to new angles of viewing data, an analysis best suited to disclosing the nature of size and shape variation (Rao, 1964). Rao further states that in no case are the statements made substantiated by statistical analysis to show that omitting some of the information neglected does not lead to misleading conclusions. Very often,

principal component analysis is first undertaken without any clear objective and then an attempt is made to interpret the derived results.

Nell (1998), Henry, Klakhaeng and Gottret (1995) used a logit regression model, following the methods of Hosmer and Lemeshow (1989) to overcome the limitations of the ordinary least squares regression model. He argues that this was done to include the estimation of relationships that include dichotomous dependent variables. According to Gujarati (2003), regression analysis is concerned with the study of the dependence of one variable (the dependent variable) on one or more other variables (the explanatory variables) with a view to estimating and/or predicting the (population) mean or average value of the former in terms of the known or fixed (in repeated sampling) values of the latter. Nell (1998) states that Grisley and Shamambo (1990) also used a logit model to predict the adoption rate of a bean cultivar. They used tabular and linear correlation methods to identify the characteristics of the households and farms studied, as well as the extent of adoption and diffusion within the study group. Randela (2005), when he was working on the integration of small-scale farmers into commercial agriculture, and Randela, Alemu and Groenewald (2008), when they were studying markets, conducted their studies within the logistic regression framework. They stated that this model is preferred, firstly, because of its ability to yield the highest predictive accuracy possible within a given a set of predictors, and secondly, because of its ability to determine the effect of variables on the probability of commercialisation. In conclusion, Uchezuba, Moshabele and Digopo (2009) found that logistic regression had been most suitable when they were working with market-type studies.

2.8 SUMMARY AND CONCLUSION

This chapter contains a comprehensive discussion on the New Institutional Economics (NIE). NIE has proven to be one of the crucial modern methods that can be utilised to assess the development of farmers within the global arena, especially with regard to small-scale farmers in sub-Saharan Africa. According to Furubotn (2001), important concepts in the NIE literature, such

as transaction costs and bounded rationality, have been used to extend the standard neoclassical model of the farm, but the hybrid models created have failed to provide adequate explanations of enterprise behaviour.

The chapter also provides an overview and definition of small-scale farming from an African perspective. The analysis highlights the fact that even though the small-scale farming sector is not well structured or financially developed, small-scale farmers continue to play a major role within the agricultural sector and the economy as a whole. Even though the term 'small-scale farming' may be used in different ways, it has some common characteristics. It is used internationally, nationally and locally, where its use is often based on different definitions. The scepticism of many people when it comes to small-scale farming also relates to viability or viable farm size (Kirsten and Van Zyl, 1998).

Agricultural output and productivity can only be improved through the division of work and specialisation. Today only a part of the production process takes place on the farm; moreover, agriculture uses industrial products like fertilizer, pesticides, machinery and equipment, along with tertiary services like banking, insurance etc., and hands its products over to other sectors for packing, processing or distribution. Today agriculture is deeply interwoven with other sectors of the economy. It can no longer produce without the inputs and services of these sectors, and it acts as a customer to these other sectors, thus providing work and income outside of agriculture.

It has been proven that poor technical assistance within the small-scale farming sector has contributed towards the failure of farmers, mainly due to poor coordination and management by technical assistants. Some of the related issues that have been highlighted are the lack of access to information and credit for small-scale farmers. The lack of credit accessibility is due to the lack of collateral, as most farmers do not have title deeds for the land (farms). These three related issues (technical assistance, credit access and access to information) are explored further within this study.

CHAPTER THREE

HISTORICAL BACKGROUND AND DESCRIPTION OF THE STUDY AREA

*The Free State landscape gladdens my heart, no matter what my mood. When
I am here I feel that nothing can shut me in, that my thoughts
can roam as far as the horizons.*

– Nelson Mandela

(in his autobiography Long Walk to Freedom)

3.1 INTRODUCTION

In order to understand the factors and circumstances with regard to the failure of small-scale farming production and marketing and also related farming constraints, it is important to gain a general and integrated overview of the area in which the study was conducted. Therefore, to understand the constraints facing small-scale farmers, it is imperative to gain a thorough understanding of their living and working conditions. It is necessary to assess which factors are constraints, and under what circumstances these constraints have influenced their decisions in terms of their farming practices (e.g. production, leadership and management).

The main purpose of this chapter is to describe as well as to give a short historical and geographical background of the study area. It also gives a short discussion on small-scale farming in Qwaqwa, and explains the reasons why Qwaqwa was chosen as the study area. This is followed by a discussion on climatic and agricultural conditions, natural resources and endowments, the demographics of the area and land-use patterns.

3.2 HISTORICAL BACKGROUND AND LOCATION OF QWAQWA

Qwaqwa is the smallest former homeland of South Africa in terms of land area and de facto population and is presently the home of the Basotho people

(Nell, 2008). Qwaqwa was once a homeland, which was formed after the segregation of people under the Natives Land Act (No. 27 of 1913) and the Native Trust and Land Act of 1936. The Natives Land Act (No. 27 of 1913), also known as the Black Land Act, made provision for the allocation of land to Africans and was passed due to constant pressure from white people to prevent the encroachment of black people on white areas. This law incorporated territorial segregation into legislation for the first time since Union in 1910. The law created reserves for black people and prohibited the sale of white territory to black people and vice versa. An annexure to this law designated the territory preliminarily allocated to black people, with the provision that a commission was to investigate the matter further for a more realistic delimitation. In effect, over 80% of the land went to white people, who made up less than 20% of the population (Reader's Digest, 1988; Muller, 1981 and Davenport, 1991).

As the population increased within the homelands, more land was needed for agricultural purposes and pressure on the land increased. Overflow and overstocking of livestock became an acute problem in the homelands and drastic steps were needed to halt the rapid deterioration of land. The Trust further made provision for the improvement of areas under occupation by Africans (Wilson and Thomson, 1975) through good farming practices. Following the demarcation imposed by the Natives Land Act of 1913 and the Land Act of 1936, Qwaqwa, then known as Witsieshoek, was classified as a Native Reserve (Davenport, 1989). It was to be under the administration of the Native Commissioner, assisted by the Witsieshoek Native Reserve Board. After the National Party (NP) came to power in 1948, it vigorously pursued its policy of apartheid under the leadership of Hendrik Verwoerd, which led to the passing of the Bantu Authorities Act of 1951 and provided for the establishment of the homeland system. Thus Qwaqwa became the homeland for the Basotho under this Act and it was granted self-government in 1974.

Originally there were two tribes of Sesotho people settled there (late 1870s) – the Kwena and the Tlokwa tribes – and although they lived separately, the Kwena were allowed to rule the Tlokwa (Nell, 1998). In 1969 the area was

combined into a single territory named KwaKwa (until it was realised that this spelling would associate them with a West African subgroup). Later that year the name was changed to Qwaqwa and in 1974 the area was granted self-government (www.crwflags.com). It had a number of different leaders after 1969 until the day of its incorporation into the Free State in 1994 (see Table 3.1 below). The first leader was Wessel Motha who took over upon the establishment of Qwaqwa.

Table 3.1: Leaders of Qwaqwa between 1969 and 1994 (*Dates in italics indicate de facto continuation of office*)

<i>TENURE</i>	<i>INCUMBENT</i>
Basotho ba Borwa	
April 1969 to <i>1 April 1972</i>	Wessel Motha, Chief Councillor
Basotho Qwaqwa	
<i>1 April 1972</i> to <i>1 November 1974</i>	Wessel Motha, Chief Councillor
Qwaqwa (Self-Rule)	
<i>1 November 1974</i> to February 1975	Wessel Motha, Chief Executive Councillor
February 1975 to <i>19 May 1975</i>	Tsiame Kenneth Mopeli, Chief Executive Councillor
<i>19 May 1975</i> to 26 April 1994	Tsiame Kenneth Mopeli, Chief Minister
<i>Qwaqwa reintegrated into South Africa on 27 April 1994</i>	

Source: www.ask.com/wiki/Chief_Ministers_of_Qwaqwa

Within the 'old' South Africa, ten homelands were created, four of which were granted 'independence' by South Africa (not recognised by any other country in the world). Qwaqwa was one of these and was established in 1969. It remained semi-autonomous until the new dispensation in 1994, when it was incorporated into South Africa and formed part of the Free State province. It is the smallest former homeland of South Africa in terms of land area and de facto population and is presently the home of the Basotho (Nell, 1998). It now forms part of the Free State and serves as the central area of Maluti-A-Phofung Municipality where their offices are.

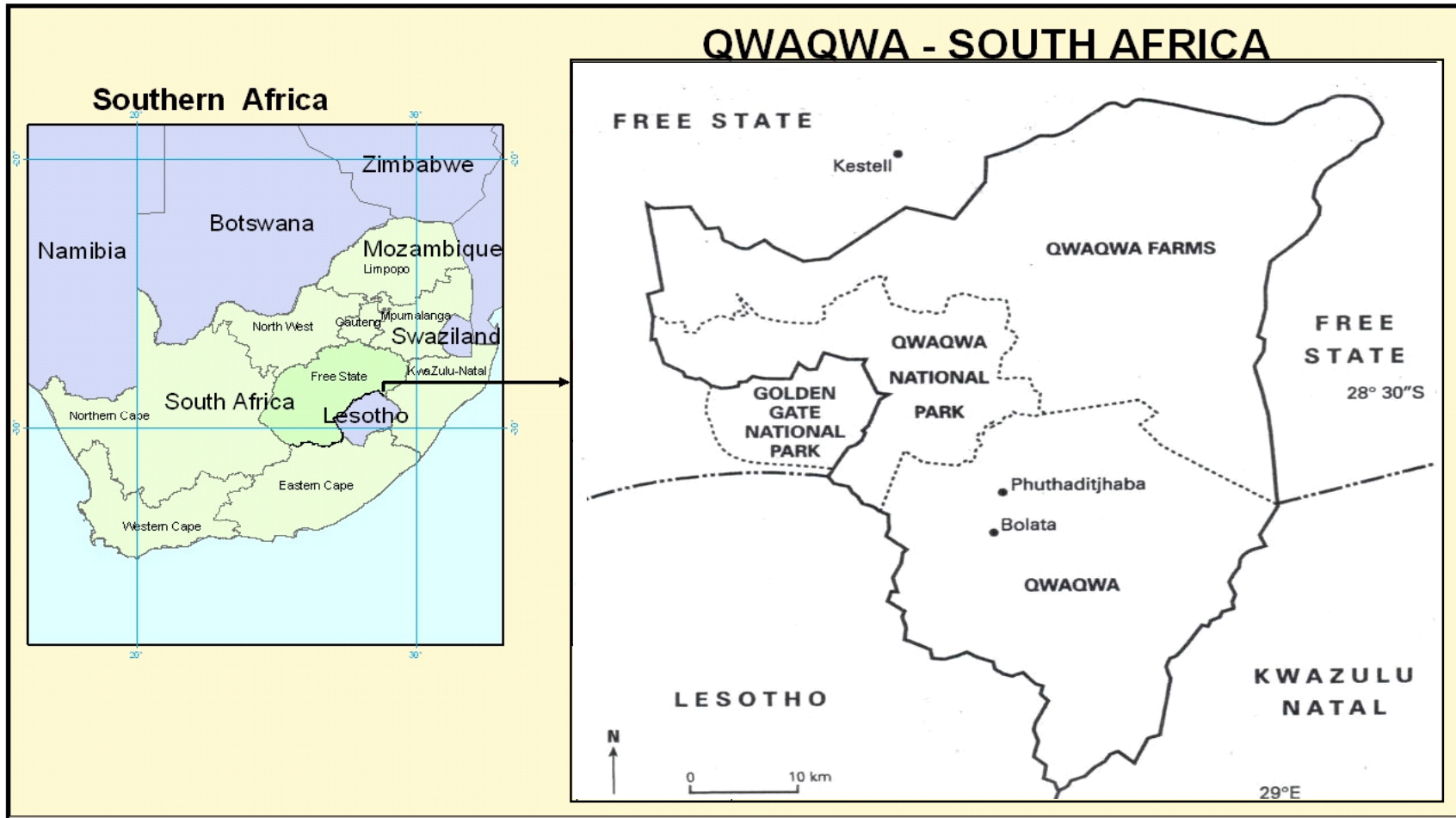


Figure 3.1: Map of Qwaqwa

Finally, Qwaqwa represents 0.37% of the total area of the Free State Province, but houses almost 10% of the Free State population. It contributed 3% of the GGP of the Free State in 1994 and it has the lowest average income and the highest poverty gap, viz.: 14.4% (Spatial Solutions, 2000).

3.3 GEOGRAPHICAL BACKGROUND

Qwaqwa, also known as Witsieshoek until 1969, is a small, mountainous former homeland (655 km²) carved out of the broader territory of South Africa. Qwaqwa is an area situated in the corner currently formed by the boundaries of the Free State, Lesotho and KwaZulu-Natal. Qwaqwa lies in a glen where the Elands River forces its way through the sandstone foothills of the Maluti Mountains after flowing from the summit of Mont-aux-Sources in the Drakensberg Mountain Range (www.africanexplore.com). The name Qwaqwa was bestowed on this area by the ancient San because in their language it meant 'whiter than white', referring to the surrounding snow-capped mountains that lend a special charm to the area during the cold winter months (Country Roads, 2010). The Afrikaans-speaking community renamed the town Witsieshoek, after Wetse, chief of the BaTlokwa section of the Basotho people, who settled here after the Zulu raids on smaller tribes had ended (www.africanexplore.com). In 1969 the area was granted self-government as Qwaqwa, the homeland of the Basotho ba Borwa ('Sotho people of the south'). Currently it is part of the Free State province. In the north-east and north-west it is completely enclosed by farms which mostly belong to white citizens of the Free State. In the east and south it is separated from adjoining territories by lofty physical barriers – the Drakensberg Mountains forming the border with Kwazulu-Natal and the Maluti range forming the border with Lesotho. On the west it is separated from the rest of the Free State by the Maluti range known as Qwaqwa.

The closest towns to Qwaqwa are Kestell, Harrismith and Bethlehem. Even though the area is close to two highly developed towns, Bethlehem and Harrismith, service delivery remains a major challenge that must be addressed first in order to overcome problems faced by farmers in the area.

Qwaqwa is now part of the Maluti-A-Phofung (M-A-P) Local Municipality, which forms part of the Thabo Mofutsanyane District Municipal Council in the eastern Free State, with a population of approximately 360 900, established on 5 December 2001 after the amalgamation of five former transitional councils. Qwaqwa now serves as the administrative centre for Maluti-A-Phofung Local Municipality (M-A-P). M-A-P has one of the highest population densities in the Free State, with 88 people per square kilometre, thus accentuating its service delivery needs. Qwaqwa is also characterised by magnificent mountain scenery. Mountain slopes are covered with a thick layer of grass that makes for good grazing, and the soil in the valleys has been described as 'rich, loamy and the best suited for agriculture'; but sour grass leads to other problems in winter.

3.3.1 Population Growth and Size

By 1996 Qwaqwa had an estimated population of 554 872 people (Erasmus, 1999). But according to Urban-Econ (1992), as cited by Nell (1998:75), a population of 470 000 was estimated for Qwaqwa in 1990, while unofficial estimations for the current population of Qwaqwa are between 700 000 and 1 million people. According to recent statistical information from StatsSA (2001) and Calitz (2007), however, the population of Qwaqwa is estimated at between 360 000 and 390 000 people. The information from StatsSA (2001), the Municipal Demarcation Board of South Africa (MDBSA) (2006) and Calitz (2007) is used for the purposes of this study.

It is also useful to classify the population according to age groups if one is seeking to consider the possible changes that can be implemented to overcome any economic constraints within the region. Population statistics in Figure 3.2 shows that the majority of the population (46%) is under the age of 19 (10% aged 0–4 years, 12% aged 5–9 years, 12% aged 10–14 years and 12% aged 15–19 years). Overall the population of Qwaqwa is mostly under the age of 35 (and considered part of the youth), and they can be encouraged to play a major role in agricultural development.

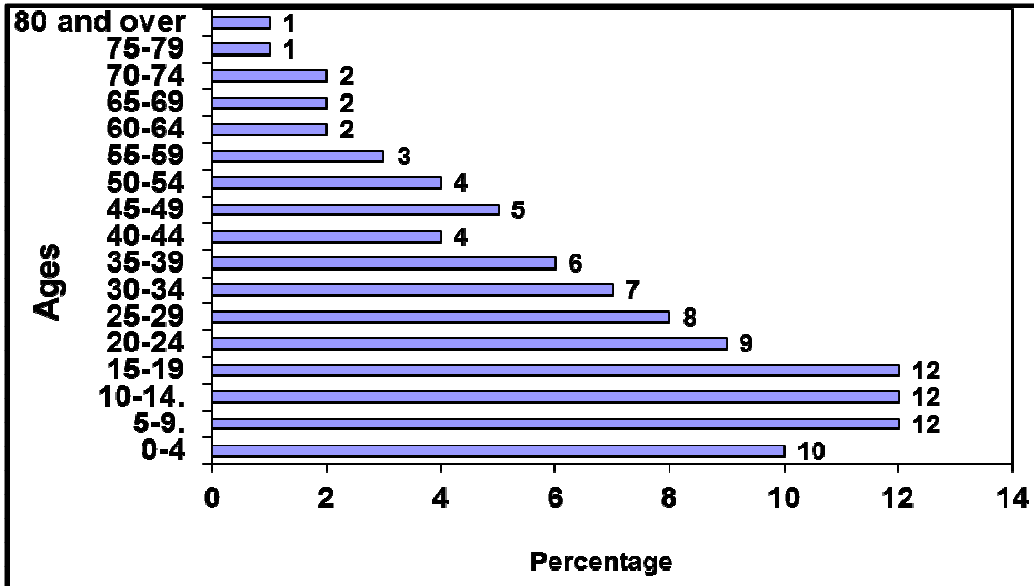


Figure 3.2: Population distribution according to age groups.
 Sources: StatsSA (2001), Municipal Demarcation Board of South Africa (MDBSA) (2006)

MDBSA (2006) mentioned that there are more women than men in the Maluti-A-Phofung Municipality (as indicated below in Figure 3.3). This corresponds to the fact that there are more women than men in the world. The difference is more substantial in this case, however, because women are responsible for taking care of the family as men go in search of work in urban areas. Even though women outnumber men, the majority of the farms are owned by men but managed by women.

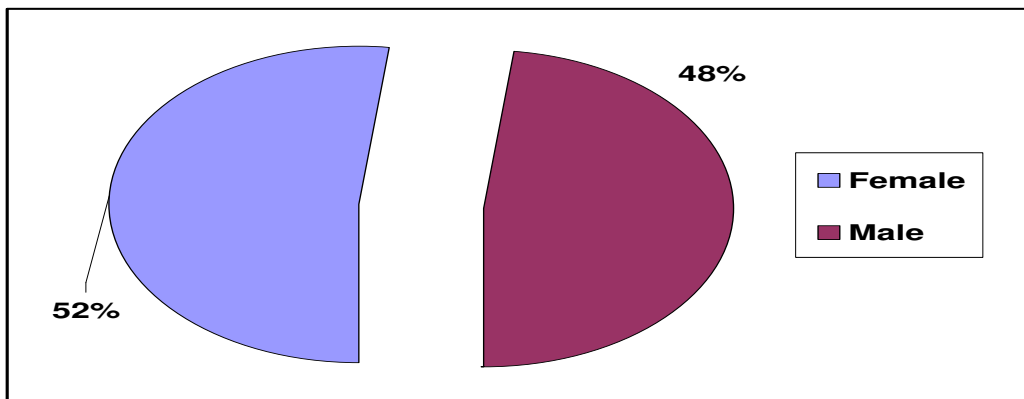


Figure 3.3: Gender classification of the population of Qwaqwa
 Sources: StatsSA (2001), MDBSA (2006)

Botha (2006) found that more than 99% are black Africans and there are almost insignificant numbers of coloured, Indian/Asian and white people

residing in Qwaqwa. Based on the findings of the study, all Indian/Asian and white people came to reside in Qwaqwa because of businesses they are running, especially the Chinese who own the majority of the firms.

3.3.2 Socio-economic characteristics

3.3.2.1 Comparison of household income and employment status

In recent years Qwaqwa has experienced an economic decline due to the closure of many industries in the area. This has resulted in unacceptably high unemployment rates. Qwaqwa has experienced an economic decline due to the closure of many industries in the area over recent years (between 2003 and 2007), which has a detrimental effect on the economic well-being of the population and a large part of the economically active section of the population has no income whatsoever (Botha, 2006). For example, in 1996 the unemployment rate in Qwaqwa was recorded as 57% (Maluti-A-Phofung, 2002). The overall unemployment rate in M-A-P was estimated at 51% in 2000 (Demarcation Board, 2000). The Demarcation Board further estimated that 69% of all households living in M-A-P were earning less than R1000 per month (53% of which were earning less than R500), thus making M-A-P the poorest local municipality in the district. Access to basic services such as clean water remains a major problem. Statistics show that that approximately 16 425 people do not have access to clean water in Harrismith and Qwaqwa (Department of Local Government and Housing, 2003).

Figure 3.4 below shows that the majority of the Qwaqwa community are still living below the poverty line of two dollars per day, as prescribed by the United Nations, while a total of 48% are still living on less than one dollar per day. A limited number of individuals (8.51%) earn more than R38 400,00 per year, with only about 40 people (0.04%) earning more than R2 457 601,00 per year. The graph shows close to 58 or more people could not be classified. Over 51% of people are economically active, but fewer than that have jobs due to a lack of job opportunities.

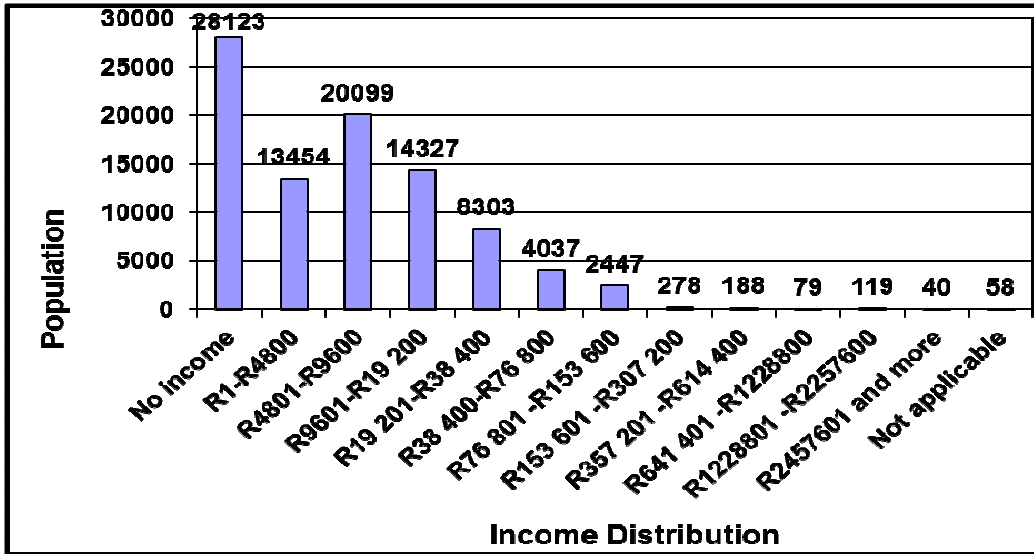


Figure 3.4: Individuals' annual income

Sources: StatsSA (2001), MDBSA (2006)

Of the total number of people who are economically active, close to 31% are employed (as shown in Figure 3.5 below). This is why Qwaqwa was declared as a national priority by the former President, Thabo Mbeki. The figure shows that up to 46% of the population are not economically active. These are people aged between 15 and 65 years who are not available for work; this category includes full-time scholars and students, full-time homemakers, those who are retired, and those who are unable or unwilling to work (StatsSA, 1996).

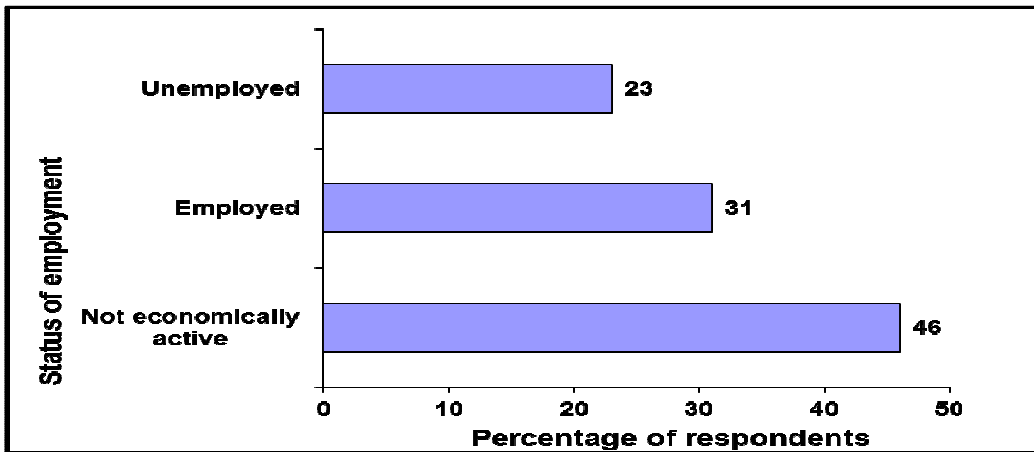


Figure 3.5: Employment status of the population of Qwaqwa.

Sources: StatsSA (2001), MDBSA (2006)

3.3.2.2 Educational background

Apart from the individual income, the proportion of pupils who are still at school (in primary and high schools) totals more than 65% (as indicated in Figure 3.6), and those that have a higher level of education total more than 6%. The fact is that Qwaqwa is surrounded by farms, which means that the youth need to be encouraged to become involved in farming so that they can assist in the economic development of their families and their community.

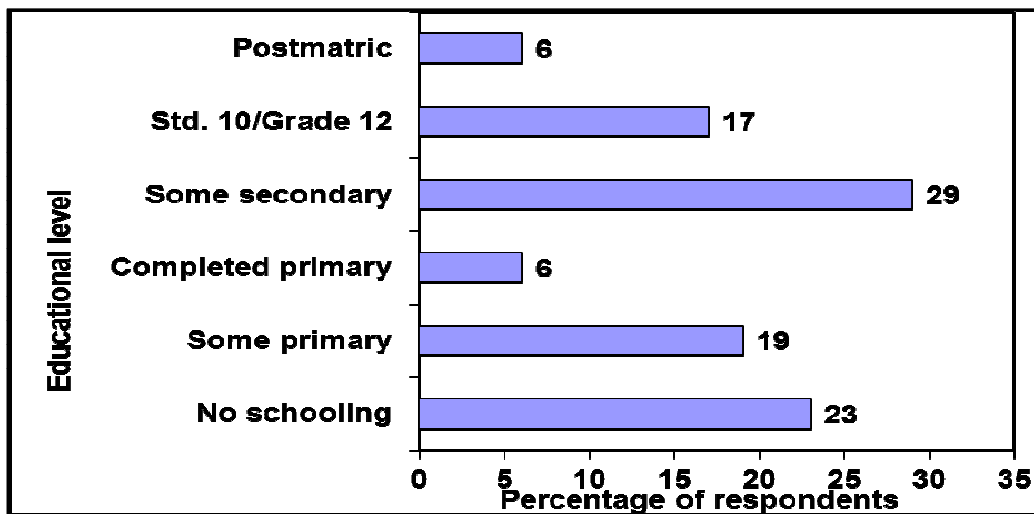


Figure 3.6: Education level of respondents

Sources: StatsSA (2001), MDBSA (2006)

Blang (1970), as cited by Bembridge (1997), state that the principal effect of literacy is to provide people with additional means of communication, and in this way it can contribute towards economic development by motivating small-scale farmers to embrace technological change. The fact of the matter is that without an educational background, it is not easy for anyone to adopt technology in their farming practices. It is evident that for small-scale farmers to succeed there is an urgent need for educational improvement. Without the involvement of the youth, the economic development of the region will never be a success as a result of rapidly improving technology. The youth can bring and adopt new technological changes in the area when they are involved in farming activities, which will ultimately improve the level of farming and increase quality production. Bembridge (1997) emphasises that it is likely that

one or more members of the household are literate and can interpret for those who are not literate – and those who can interpret for their family members are the new generation (the youth).

3.3.3 Access to transport

Access to general transport facilities also seems to be poor. Even though most people have access to some form of telephonic communication, very few people have access to their own transport. They have to make use of mini-buses or taxis whenever they are unable to walk to their desired destination and back. This will have a huge effect on their buying behaviour and on consumer trends in general (Botha, 2006). Nell (1998) adds that roads vary from poor to non-existent, and there are no roads in the mountainous areas, where the only means of transport is by horse or donkey.

3.4 NATURAL RESOURCE ENDOWMENT

Qwaqwa's development can be associated with the characteristics of its natural and human resources. It is a mountainous area. These natural surroundings and the distribution of its natural and agricultural resources determine the agricultural potential of this area.

3.4.1 Topography

The topography is rugged and much of the land is unsuitable for agriculture. Fertile land is extremely limited, and settlement and farming compete for land. Population pressure on the land became a persistent problem in the twentieth century and continues today. Qwaqwa has a typically high-veld climate, with hot summers and cold winters. Access to villages is limited by the topography of the area. The slopes are very steep, making road construction and maintenance extremely expensive. The roads that give access to villages are mostly in poor condition. Some have been upgraded, but proper maintenance is a prevailing problem. Some villages are still only accessible on foot.

Semela (2005) mentioned that, *'The summer pastures are mainly situated on the slopes of the Maluti Mountain, and rank among the best grazes found in the Eastern Free State. With the exception of the slopes of the foothills of the Maluti facing south or south-west, where the veld is mainly sour, the pasturage can be grazed virtually throughout the year. This veld is mainly grazed during summer because the winter is very cold for the animals, and they usually have to be brought to the lower lying and warmer areas in winter'*.

3.4.2 Rainfall and temperatures

According to Nell (1998) and Mwalukomo (2008), Qwaqwa lies within the summer rainfall region of South Africa with more than 85% of total annual precipitation occurring in the period between September and March. Nell further states that the highest precipitation (1300 to 2000 mm per year) occurs in the mountains with a gradual decrease towards the lower lying areas. Overall the average annual rainfall varies between 750 and 1000 mm and occurs mainly during the summer months in the form of thunderstorms. As it is a summer-rainfall region, it can be extremely cold during the winter months, especially towards the eastern mountainous regions where temperatures can drop as low as -9.5°C. Temperatures are very variable and may drop suddenly by up to 10°C and this variation in temperatures is even worse in the mountainous areas where most of the small ruminant farmers keep their herds. Snowfalls during late July normally claim the lives of many animals (Nell, 1998). It can, however, also get extremely hot, especially during January, which is the hottest month (with an average temperature of 27.4°C).

3.4.3 Soil and terrain

The soils are mainly red and yellow, structureless, and usually moderately deep. Small areas of clay soils and shallow soils on rock also occur and some of the clay soils have a significant erosion hazard, especially where the topsoil is sandy (ARC, 2006).

3.4.4 Water resources

Access to water is considered a basic human right in the new South Africa, and water is regarded as one of the most critical scarce resources. The lack of a sufficient supply of safe water can adversely affect numerous human rights including the right to life, the right to the highest attainable standard of health and the right to an adequate standard of living, which includes adequate food and housing. The right to water entails its availability in sufficient quantities for domestic and personal use (i.e. agricultural production, etc.) and its freedom from elements that could constitute a threat to human health. According to Harmala (2004), *farmers throughout the world are facing many challenges in increasing water and in managing water supplies. Of all challenges facing farmers, the most critical is having secure access to water supplies of good quality. At the same time the demand for freshwater is increasing from industry to industry, and the expanding urban areas.* Qwaqwa is no exception in this regard, because although there are dams and rivers in the region, it is difficult for small-scale farmers to access water due to poor infrastructure.

3.5 LAND TENURE

Even though the issue of land has been referred to within this chapter, it is important to again emphasise the issue of land tenure in Qwaqwa. There are two basic land tenure systems in Qwaqwa, namely communal land and farms on commercial land, which are rented from the government with the option to buy after five years (Nell, 1998). In the Old Qwaqwa we find farmers who were settled there around 1971 and are farming on communal land that belongs to the different chiefs or headmen, and only people who are residents of the village under the command of the chief can farm in the village area. In the New Qwaqwa, however, farmers were settled there between 1991 and 1994 on consolidated land on the basis that they must pay yearly rent, which is much lower than the current going rate in the area. The main difference between the two land tenure systems is that the farmers in New Qwaqwa are working towards a goal to buy the farms which they are farming commercially,

whilst farmers in Old Qwaqwa (communal farming system) know that they will never be able to buy the land (Nell, 1998). Also, farmers in New Qwaqwa are farming on land that had been fairly well managed until the late 1980s, while farmers in Old Qwaqwa farm on veld that has been overgrazed over a long period (Very and Smith, 1980 as cited by Nell, 1998). Farmers in New Qwaqwa are controlling the livestock numbers to protect the quality of their natural veld (Nell, 1998).

According to Erasmus (2002), a variety of landowners and tenure systems – where different processes of land reform are under way – can be identified in the ‘Old’ and the ‘New’ Qwaqwa; and this unnecessarily contributes to a complex and difficult situation, while a unilateral tenure system would expedite land reform and should therefore be effected as soon as possible. Therefore in an area like Qwaqwa there are no quick fix solutions for land reform; however, resolving land conflict, upgrading existing informal settlements and co-ordinating the large numbers of role players which make implementation extremely difficult, seem to be apparent starting points (Erasmus, 2002).

3.6 ECONOMIC ACTIVITIES

Economic activity involves the use of scarce resources in the provision of goods to satisfy unlimited wants. It is a measure for meeting the problem of making a living; other categories of work are not related to this problem. There may be differences in nature between one source of livelihood and another but the underlying similarity in all spheres of economic activities is that work is performed against remuneration. In the modern social scheme of things, these activities rotate around the financial axis.

According to Botha (2005), Qwaqwa has experienced an economic decline due to the closure of many industries in the area during the past years, which has had a detrimental effect on the economic well-being of the population. The bulk of the economic activities are concentrated in and around Phuthaditjhaba with a few economic activities concentrated on the routes to some of the settlements, and Government is the biggest contributor to the

GGP, with manufacturing and farming in the second and third place (Van Niekerk, 2000). Van Niekerk further states that manufacturing had declined during the previous year since quite a number of industries had moved out of Qwaqwa due to labour problems, the rising costs of manufacturing and the end of the subsidy policy under the pre-1994 government. The relocation of the government offices from Phuthaditjhaba to Bloemfontein also had an influence on the job structure of the area. The few farming projects that had been established previously are still struggling with implementation problems or do not operate at full capacity; many people rely on the informal sector for an income, with a high rate of dependency on pensions. Pensioners have to travel to Phuthaditjhaba for payments since there are no banks in the rural areas. Income-generation is therefore one of the most important policy issues (Van Niekerk, 2000).

3.7 LAND-USE PATTERNS

3.7.1 Agriculture

Products produced by the small-scale farmers reflect the wide range of production possibilities presented by South African's wide, diverse agricultural circumstances, but substantial proportions of production are either used for consumption or sold to the local communities (Van Renen, 1997). The reorganisation of the Free State Province brought mergers for both Qwaqwa and the provincial departments, and small-scale farmers continue to struggle. AgriQwa, Qwaqwa's former agricultural corporation, was in part re-formed into a new parastatal, Agri-Eco, in 1994, with the provincial Department of Agriculture introducing training and services.

NDA (1998) alluded that agriculture is an important source of revenue and comprises mainly crops (maize, wheat and sunflowers), livestock (cattle and sheep) and game farming in areas unsuitable for crops. (It was once identified for infrastructural and economic development by the previous government). An area of about 70 000 ha was identified for the development and settlement of black farmers during the period between 1986 and 1994 (Jordaan, 2003).

The current land reform policy poses serious challenges for the settlement of individual small-scale farmers in Qwaqwa (Du Plessis, Van Schalkwyk and Louw, 2000). Therefore once farmers are well developed, agriculture will be one of the sectors that will play an important role in the economy of Qwaqwa and the surrounding regions.

3.7.1.1 Livestock and crop production

Semela (2005) found out that the grazing area in Qwaqwa consists of two portions, namely the summer portion in the Maluti that lies above an altitude of approximately two thousands metres, and the portion situated between two and five thousand metres above sea level. The latter includes valleys and river banks. The most important factor limiting agricultural production is the availability of water. Rainfall is distributed unevenly across the area. The region is subdivided into a number of farming regions according to climate, natural vegetation, types of soil and the type of farming practised. Agricultural activities in this region (Qwaqwa) range from intensive crop production and mixed farming in both winter-rainfall and high summer-rainfall areas, to cattle and sheep farming in the more arid regions. Livestock in most rural areas is kept for numerous reasons including milk, sales, investment, savings, feasts and ceremonies, cultivation, dowry, meat, manure and draught power (Ntshona, 2002). There is a lack of access to grazing fields, as some fields are tribally owned and farmers need permission from the tribal authorities before their livestock can be allowed to graze in those areas. Because of the population growth and the high stocking rate of animals of 7.7 SSUs (small stock units) per hectare, which is more than five times the carrying capacity, farmers are forced to move with their herds from low lying areas with highly nutritional veld to the mountains where the nutritional value of the veld is lower (Nell, 1998).

Vrey and Smith (1980), as cited by Nell, Van Schalkwyk, Sanders, Schwalbach and Bester (1998), say that Qwaqwa is mainly a livestock production area with very little high-quality arable land for cash crops. Crop production on dry land is very risky and makes farmers' enterprises vulnerable

to adverse weather conditions (Du Plessis *et al.*, 2000). The fluctuation in the annual rainfall also results in a wide variation in crop production. The farmers have been reluctant to convert to other farming activities, as this requires new methods and/or the purchasing of new production equipment.

3.7.2 Nature conservation and nature reserves

Despite all the socio-economic challenges facing the Qwaqwa development node, the area has major potential for development in tourism because of its scenic beauty and rich cultural heritage (SANPARKS, 2006). If developed well, the tourism industry could go a long way towards breaking the cycle of poverty in M-A-P.

Qwaqwa lies in the foothills of the Maluti Mountains in the Drakensburg range, bordered by the Sterkfontein Dam in the east, by Kestell in the north and by Lesotho to the south. In 2004 Qwaqwa was named the Presidential Nodal Point due to high levels of poverty, unemployment and population growth. It has a few nature resources such as the Golden Gate Highlands National Park (NP), the Fika-Patso Dam and the Basotho Cultural Village, which act as tourist attractions. As such the Golden Gate Highlands NP can play a major role in contributing towards poverty alleviation in the region. This national park is characterised by summer rainfall, temperate summers and cold winters.

The South African National Parks Board (SANPARKS, 2006) states that *“The Golden Gate Highlands NP’s desired state is a park that has grown in size to be ecologically sustainable and representative of the unique biodiversity and cultural heritage characteristic of the area, is a proud tourism destination and employment opportunity for the region, is financially sustainable and follows adaptive management principles towards continuous self-improvement. The Vision and Mission for Golden Gate Highlands NP therefore emphasise the importance to its stakeholders of managing and using the park’s natural and cultural resources in a sustainable manner”*.

It was in the context of an ideological shift towards participatory conservation, the rapid transition to democracy in South Africa and a growing potential for tourism that the Qwaqwa National Park (QNP) was established in 1992 (Slater, 2002). Slater states that when elections took place in South Africa in 1994, Qwaqwa was incorporated into Free State Province and lost its legislative function as a self-governing territory, and therefore in 1995 QNP was made the responsibility of Agri-Eco, a new, wholly government-owned parastatal organisation that emerged from the reorganisation and reconstruction of former Qwaqwa government agencies.

3.8 CONCLUSION

It can be concluded from the historical background that Qwaqwa is an area with a rich history, from its early origins to where it is today. It is a place that is known for its cultural heritage and traditions; and it is dominated by mountain peaks and hills in the east, south and west, which comprise some of the tourist attractions of the area.

Ortmann and King (2006) mentioned that small-scale (communal) farmers in 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. Against the backdrop of Qwaqwa's status as a former homeland state, it was within the aims and objectives of this study to oversee (assess) the progress of small-scale farmers within the new dispensation. The main reason is that prior to 1994, small-scale farmers received assistance with their farming activities from their previous homeland states, even though overall they benefited less than their white farmer counterparts. However, once the homelands were abolished and integrated into the new South Africa, small-scale farmers were met with high competition and no more subsidies for their farming were available. Based on this information, Qwaqwa as a former homeland was chosen as a suitable site for a study of this type.

In conclusion, the influence of the fast-increasing population growth on the deterioration of the natural resources, which are essential for the development of farmers in former homelands, is very serious in Old Qwaqwa but less important in New Qwaqwa (Nell, 1998).

CHAPTER FOUR

DESCRIPTIVE RESULTS OF THE SURVEYED DATA

4.1 INTRODUCTION

The literature review presented and discussed in Chapter Two has shown that there are many constraining factors that limit the success of small-scale farmers. In order to do a meaningful study of these factors, it is essential that information about the characteristics of these farming communities, their resources, as well as other conditions within the existing framework is carefully considered.

Therefore the objective of this chapter is to provide an overview of data, how it was gathered and to do a thorough evaluation of their characteristics with regard to farmers' main resources, household demographic information, land titles and agriculture, human capital endowments, infrastructure and capital. A similar procedure is applied in the discussion of resources, which include management skills, access to credit, training and information services, technical assistance (or extension service), agricultural supportive institutions and market access.

4.2 DATA

4.2.1 Collection of Information

The data was collected between with the assistance of the National African Farmers' Union of South Africa (NAFU-SA). The discussions or interviews consisted of a combination of structured, closed and open-ended questions. The survey team consisted of a group of five enumerators (students) from the University of the Free State (Bloemfontein main campus), who were trained in the methods and objectives and also how to conduct this type of study, and

who also understood the questionnaire. Some of the farmers were interviewed on their respective farms, while others were interviewed at the Qwaqwa Agricultural Training Centre. As already stated, the questionnaire was pretested on ten small-scale farmers before being used in the study. Ideally pretesting helps to improve the quality of data collected, to reduce survey development time and to reduce survey costs.

A list of farmers involved in both livestock and crop production in the Qwaqwa area of the eastern Free State was obtained from the regional office of the District Director, Department of Agriculture, in Qwaqwa.

Additional information with regard to population growth, age, educational background, farming area available and human capital endowments was provided by different sources, e.g. Galitz (2007), the Demarcation Board (2000), the Department of Local Government and Housing (2003), Erasmus (1999), Maluti-A-Phofung (2002), Municipal Demarcation Board of South Africa (MDBSA) (2006), StatsSA (1996) and StatsSA (2001).

4.2.2 Questionnaire development

Primary data collection always involves the trade-off between undertaking an intensive study in a small geographical area versus broader examination of a larger area. In attempting to balance the requirement for capturing important details and unlimited applicability, a questionnaire was designed as the main tool for data collection (Appendix A). Examples of other questionnaires from Nell (1998), Magingxa (2006) and Montshwe (2006) were used, and significant variables that have had a negative impact on farming success as found in other studies conducted locally or abroad were used as guidance for the study.

4.2.3 Sampling

Sampling can be regarded as the act, process or technique of selecting a suitable sample (a sample being a finite part of a statistical population whose

properties are studied to gain information about the whole) (Webster, 1985), or a representative part of a population, for the purpose of determining parameters or characteristics of the population as a whole. Based on that, it was important for the success of the study to do sampling as not all farmers could be reached because of time and related resource constraints.

4.3 DEMOGRAPHIC CHARACTERISTICS

The average household in Qwaqwa consists of approximately five members. Each member of the family was assigned according to his or her gender and age. Demographic characteristics include also the marital status of the household members, their level of education and occupation.

Some of the small-scale farmers who participated in the study are pictured in Figure 4.1 below. This photograph was taken on the first day of data collection at the Qwaqwa Agricultural Training Centre, where an overwhelming response was observed.



Figure 4.1: Group of small-scale farmers who participated in the study

4.3.1 Gender profile

From the literature review and based on general knowledge it is known that there are more women than men in Qwaqwa (MDBSA, 2006). However, it is observed that very few women participate in the agricultural sector or related activities. Although agricultural decisions are made by male heads of the households 89% of the time, as compared to 11% made by women who are also household heads, women do more work as compared to the males. The reason for this tendency might lie with the cultural backgrounds and customs of African communities.

What is amazing is that on some of these farms women were responsible for most of the duties, but men were – or claimed to be – the overseers of everything. The gender profile of respondents is shown below in Figure 4.2.

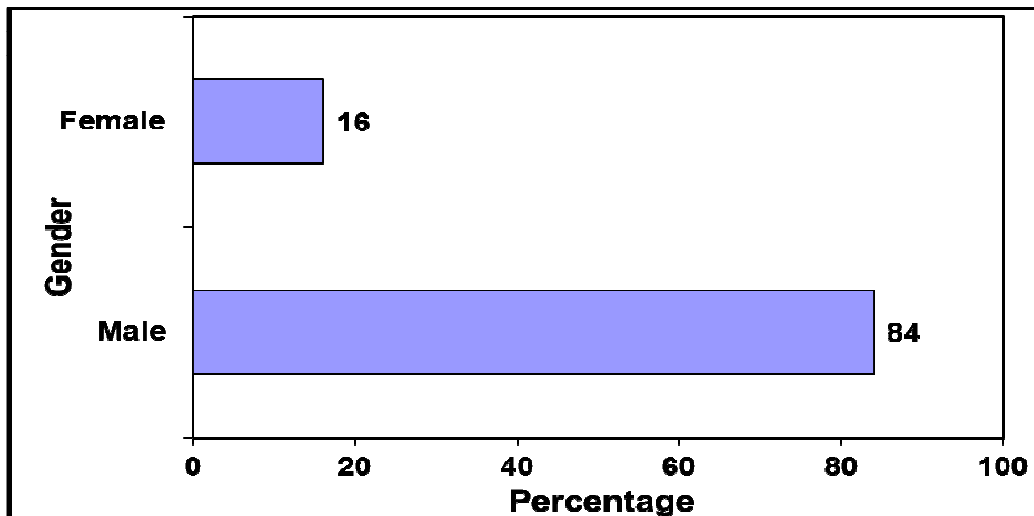


Figure 4.2: Gender of small-scale farmers (n=100)

Men made up 84% of the total number of respondents, and women a mere 16%. Even though women play a significant role in farming, there is little recognition for this fact, or for their contribution to the socio-economic development of the nation. Therefore the entrenched social and religious norms that define women as being secondary and subordinate citizens keep women vulnerable and dependent, and allow them to be exploited as

agricultural workers. Consequently, the majority of rural women do not own land, or have no access to productive resources.

4.3.2 Age of farmers and their household members

Age is a significant issue that is perhaps related to the success of farming businesses. It can be justified by the hypothesis that it is easier for younger people than for older people to adopt new technology (Nell, 1998).

Most of the respondents were over the age from 51 years old (Table 4.1 below). Based on the number of youth involved in farming, there is a clear indication that there is an urgent need for the youth to be physically involved in the daily running of their parents' farming businesses to ensure success (especially with regard to issues related to the adoption of technology). Only 8% of the respondents were under the age of 35 years. The reason for this is that the majority of the youth are attracted to city life. Once they have completed their schooling, they do not want to be associated with farming, or they do not see it as a sustainable livelihood.

Table 4.1: Age distribution of respondents (n=100)

<i>Age class</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Cumulative percentage</i>
20-35	8	8,0	8,0
36-50	29	29,0	37,0
51-65	49	49,0	86,0
>65	14	14,0	100,0
Total	100	100,0	

This tendency of young people not to be interested in farming reveals an obvious need to encourage them to assist with or take over the daily duties of farming. Once the youth have been recruited or advised to take part in the farming activities, they would be able to implement many changes in the management of the farm, including the adoption of technology, improved methods of record keeping, etc., which would all serve to improve the standard of production and increase their access to markets. The testing of

this hypothesis lies in the adoption of technology, as well as other scientifically related issues.

The ages of the other members of the households were also analysed. It was found that 24.8% of members of the households are between the ages of 0 and 18, and the majority (58%) of other members are between 19 and 55 years (as shown in Table 4.2 below).

Table 4.2: Demographic characteristics of household members

<i>Age group</i>	<i>Total number of persons in survey excluding household heads</i>	<i>Average persons per household</i>
0-4 (Children)	24	0,92
5-10 (Children)	37	1,61
11-18 (Children)	65	2,31
19-25 years (males and females)	110	3,65
26-40 years (males and females)	111	3,66
41-55 years (males and females)	75	2,71
56-65 years (males and females)	58	1,73
>65 years (males and females)	28	1,16

Apart from the household heads, there are other members of the families who are either or related to the other member of the family; their ages range from 56 to over 65 years.

4.3.3 Household size

Statistical information indicates a mean household size of 2.17 with a standard deviation of 0.652 (Table 4.3). Household size ranges from 1-3 members to 4-6 members and 6+ members per household respectively. Households were grouped into the following classes or sizes:

Table 4.3: Percentage, standard deviation and mean of household members (n=100)

N	Valid	100	
	Missing	0	
Mean		2.17	
Std. Deviation		.652	
Household class (sizes)	Frequency	Percentage	Cumulative percentage
1-3	14	14,0	14,0
4-6	55	55,0	69,0
>6	31	31,0	100,0
Total	100	100,0	

According to Sesotho culture there is a myth that a man is a man because of the size of his family, which is why more than 80% of the respondents or households had more than three children or siblings (Table 4.3). Results from this survey only show the number of children staying with their parents (farmers), excluding those children who were either working or married and no longer living with their parents.

4.3.4 Level of education

Education is one of the most important determinants of the success of individuals, including farmers, due to the fact that it helps to improve the standard of living. In farming it helps to improve the farmers' chances of adopting new farming techniques, which will also lead to success. Based on the emphasis put forward by Alam, Hoque, Khalifa, Siraj and Ghani (2009), education is one of the agents of transformation in the agricultural sector. Most farmers in the Qwaqwa region are not familiar with technical improvements or innovations that can be implemented in farming practices. The majority still make use of the old methods of farming, and they also tend to await the arrival of extension officers to give them guidelines in terms of farming. It is believed the reason for this situation is due to their poor educational background. Table 4.4 illustrates the level of education of the respondents.

Table 4.4: Educational background of respondents in terms of percentage

<i>Educational level or Standard reached</i>	<i>Percentage (%)</i>
No educational background	11
<Grade 5	41
Grade 5-7	14
Grade 8-10	16
Grade 11-12	14
Post-matric	4

It is clear that 11% of the respondents do not have any formal educational training and over 40% of respondents have less than a Grade 5 (Standard 3) education qualification. A further 14%, 16% and 14% have Grade 5-7, Grade 8-10 and Grade 11-12 respectively and only 4% have a post-matric (post-Grade 12) qualification. In terms of languages spoken by respondents, 100% could speak, write and read Sesotho; 47% could read and speak Afrikaans, and 39% could read, speak and write English. This study shows that due to the respondents' limited education, they were most proficient in the Sesotho (South Sotho) language when it came to writing and communicating.

4.3.5 Occupation

The majority of the respondents were entirely dependent on farming as a source of livelihood, with only a few having occupations (jobs) other than farming. Over 92% of respondents had no other related occupation, meaning that they are unemployed, while only 8% had other related jobs or businesses besides farming (3% being teachers and 5% being either taxi owners or taxi drivers) (Table 4.5).

Table 4.5: Occupational distribution of respondents (n=100)

<i>Occupational class</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Cumulative percentage</i>
Teaching	3	30,0	30,0
Taxi Driver/ Owner	5	50,0	80,0
Unemployed	92	92,0	100,0
Total	100	100,0	

The answers given by the respondents indicate that they sometimes found it difficult to find jobs outside of farming, as they are regarded as old by potential

employers. Another problem is that some farmers classified as old-age pensioners survive through the assistance they receive from their children, who are employed elsewhere.

4.4 LAND AND AGRICULTURE

It is essential to outline the importance and the use of land and the agricultural activities taking place in the region, as this can help to clearly identify small-scale farmers requiring assistance with their related farming activities. This can also assist the policymakers in adopting strategies that will enable them to render good or even excellent service to the farmers, and will prove beneficial in terms of documentation for future planning purposes. Of the 100 small-scale farmers sampled in this study, only 9 respondents were farming on communal land; 3 respondents were farming on leased or rented land and the remainder (88 respondents) were farming on their own land (meaning that they had ownership of the land, with title deeds). Some had purchased the land with the assistance of commercial banks or the government, or had inherited the land from their parents.

4.4.1 Types of farming

Small-scale farmers within this region are mixed farmers (livestock and crops), although the majority (53%) are livestock farmers (e.g. cattle, sheep, horses, goats, etc.). Livestock has long been regarded as the most valuable possession of the Sesotho-speaking people, indicating the wealth of an individual within the community. Livestock, especially cattle and horses, are most favoured amongst the Basotho people, as they can be used as a mode of transport and for many other related purposes, as already discussed in Chapter Two. Table 4.6 below shows the classification of farmers.

Table 4.6: Farming classification

<i>Farming Classification</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Cumulative percentage</i>
1 Crops (Irrigation)	2	2,0	2,0
2 Crops (Dry land)	1	1,0	3,0
3 Livestock	53	53,0	56,0
4 Mixed	44	44,0	100,0
Total	100	100,0	

44% of respondents were farming with both livestock and crops (mixed farming). A mere 3% of respondents were solely crop farmers. Crops do play a major role within farming communities, as they provide the staple food (maize meal). The types of crops (e.g. pumpkin, carrots, cabbage, potatoes, maize, etc.) planted in this region depend on the climate, topography, altitude, latitude and so forth, but most of the farmers produce maize, with pap being their staple food. Crops can be sold, given to animals as food or used within the household for consumption purposes.

4.4.2 Soil type

Soil plays a crucial role in both livestock and crop farming, but particularly in crop farming, as certain crops do not grow in certain types of soil. (E.g. tomatoes, carrots, etc. do not grow well on clay soil). Farmers in Qwaqwa were found to be farming in different soil types (Table 4.7).

Table 4.7: Soil classification (type) on farms

<i>Type of soil</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Cumulative percentage</i>
Sandy	20	20,0	20,0
Clay	40	40,0	60,0
Loamy	27	27,0	87,0
Other	13	13,0	100,0
Total	100	100,0	

Soil type plays a significant role in agricultural production, especially in terms of crops. Soil type helps determine which types of crops or livestock can be successfully farmed in a particular area. One of the major problems constraining small-scale farmers is soil erosion, and small-scale farmers have implemented different measures in an effort to counteract that (Table 4.8).

Table 4.8: Measures adopted by respondents to prevent soil loss

Classification of soil loss measures:	Frequency	Percentage	Cumulative percentage
Mechanical measures	17	17,0	17,0
Organic measures	8	8,0	25,0
Stubble cultivation	7	7,0	32,0
Other	10	10,0	42,0
None	58	58,0	100,0
Total	100	100,0	

Measures to prevent soil erosion have been classified as follows: 1) mechanical measures (entailing the use of share-ploughs to create a coarse, cloddy soil surface); 2) organic measures (covering crops, using crop residues or other organic matter on the surface); 3) stubble cultivation (leaving stubble on the surface); 4) strip cultivation (leaving the previous season's crop standing, or cutting off high when harvesting and planting between the old rows); and lastly any other measures used by respondents but not shown on the questionnaire. A total of 58% of respondents had never implemented any measures against soil erosion due to the fact that they had never experienced any soil erosion on their respective farms.

4.4.3 Farm size

Farm size in the study area varied between 50 and 300 hectares. For the purposes of the study, they were grouped in intervals of 50 ha (Table 4.9). The majority of respondents had been given their farms by the government of the former homeland, and some were still farming on communal land, with the permission of the tribal authorities, for a lease period of ten years.

The standard deviation allows a conclusion to be drawn regarding farming distribution. Assuming that the distribution of farms is normal or bell-shaped, the following conclusions can be drawn:

- Approximately 68% of the farms in the sample will fall within one standard deviation of the mean;
- approximately 95% of the farms in the sample will fall within two standard deviations of the mean; and

- approximately 99% of the farms in the sample will fall within three standard deviations of the mean.

For instance, since the mean is 3.59 with a standard deviation of 2.161, it can be estimated that approximately 63% of farms will fall in the range of 50 to 250 ha. The minimum farm size is 50 hectares and the maximum size is 300 hectares for owned land.

Table 4.9: Farm sizes in hectares

N	Valid	100
	Missing	0
Mean		3.59
Std. Deviation		2.161
Range		5

<i>Land size class (ha)</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Cumulative percentage</i>
1-50	33	33,0	33.0
51-100	5	5,0	38.0
101-150	10	10,0	48.0
151-200	11	11,0	59.0
201-250	4	4,0	63.0
>250	37	37.0	100.0
Total	100	100.0	

The communal and leased or rented land is a minimum of 50 hectares and a maximum of 300 hectares in size. This kind of information is a critical stepping stone in comparing the performance (production) of one farm with the performance of another, even when farms are measured on entirely different scales.

4.5 HUMAN CAPITAL ENDOWMENTS

4.5.1 Farming qualities and experience

The respondents' average farming experience was 10 years, as some of them had worked on the farms before becoming owners. Table 4.10 below indicates the level of farming experience.

Table 4.10: Respondents' level of farming experience

<i>Farming period (in years)</i>	<i>Percentage (%)</i>
1-10	52
11-20	36
>20	12

A total of 52% of the respondents had between 1 and 10 years of farming experience, while 36% had between 11 and 20 years of experience and the remainder (12%) had more than 20 years of farming experience. The quality of production possibly lies with the level of farming experience, although certain aspects do not require experience, e.g. the adoption of technology.

4.5.2 Farm planning skills

Farm planning based on management and production is one of the problems facing farmers in the region, especially those over the age of 60 years. Although some farmers do take the initiative to plan, some do not bother to do that. A total of 5% of the respondents had never made an effort in terms of farm planning (Table 4.11). Only 48% always planned, even though their plans were not always perfect. A total of 47% sometimes planned, especially when faced with farming problems related to finances, production, access to water, marketing, etc.

Table 4.11: Farm planning skills

<i>Planning skills</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Cumulative percentage</i>
Always	48	48,0	48,0
Sometimes	47	47,0	95,0
Never	5	5,0	100,0
Total	100	100,0	

Due to a lack of planning it is not the case that whatever the farmer has in mind is automatically a success, and failure to plan has been shown to be a major reason for poor-quality production. This has led to many farmers not being able to sell their products in the formal or informal markets.

4.6 INFRASTRUCTURE AND CAPITAL

4.6.1 Available equipment

The study found that small-scale farmers in the region have no assets that can be regarded as valuable for the farming business, e.g. tractors, planters, ploughs, combine harvesters, etc. They rely on old implements that were given to them by the then government of Qwaqwa. Apart from these they borrow or lease implements from their fellow farmers who are situated in Bethlehem and Harrismith.

4.6.2 Financial management

Farm management plays a major role in the success of the farm business. It is important for the farmer to ensure that his or her farm is well managed and taken care of, since no business can succeed where there is poor management. Management includes aspects such as marketing management, record keeping (e.g. income statements, cash flow statements and enterprise budgets), etc.

Records of income and costs play a major role within the farming community, as they determine the success or the downfall of the business. As indicated in Table 4.12 below, some of the respondents kept such records and others did not, while others wanted to keep such records but were unable to do so due to a lack of knowledge and understanding. Nearly 40% of respondents kept no records of income or costs. This clearly indicates that the farmers were not keeping records of items purchased for their farms. This causes major problems, because they are unable to determine their income and costs. Ultimately this leads to a situation where a farmer is at risk of losing the farm because of huge debts. Close to 5% of respondents were farming on behalf of the commercial banks, which means that whatever they were producing was being taken or sold by their creditors and the respondents received only what their creditors felt was due to them. This situation has prevailed for many

years and many farmers have lost their land to commercial banks for failing to repay their loans.

Table 4.12: Income and cost records keeping

Income records				
		Frequency	Percentage	Cumulative percentage
Valid	None	40	40.0	40
	Only ideas	24	24.0	64
	Rough incomplete	15	15.0	79
	Thorough neat	21	21.0	100
Total		100	100.0	
Costs records				
		Frequency	Percentage	Cumulative percentage
Valid	None	38	38.0	38.0
	Only ideas	26	26.0	64.0
	Rough incomplete	15	15.0	79.0
	Thorough neat	21	21.0	100.0
Total		100	100.0	

The main problem is that farmers do not know how to keep financial records; or else they do know the importance of doing so but they fail to follow the proper procedures. More than 85% of the respondents answered that record keeping is important, while only 15% responded that it is not important. Therefore there is a need to be trained on how to draw up and keep financial records.

4.6.3 Marketing management

Poor levels of planning have resulted in small-scale farmers' being unable to market their produce. There are no proper channels to access information on marketing, quality of products, etc. Crop farmers especially have no clear idea of how much, if any, surplus they have produced, which leads to the difficult position where they are unable to clearly state how much they will sell and how much will be stored for later use or consumption.

The respondents who were storing their surplus produce gave a number of reasons for doing so, as indicated in Table 4.13 below.

Table 4.13: Reasons for storing surplus production (n=100)

<i>Reasons</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Cumulative percentage</i>
Never stored surplus	69	69,0	69,0
To sell at higher price	7	7,0	76,0
Store for seed	8	8,0	84,0
Lack of access to markets	3	3,0	87,0
For consumption	10	10,0	97,0
Other	3	3,0	100,0
Total	100	100,0	

The respondents gave the following reasons for storing their surplus: to sell later at a higher price (7%), for seed production (8%), lack of access to the market (3%), for consumption (10%) and for other related activities (3%). A total of 69% of respondents had never stored surplus produce.

4.6.4 Labour usage

The term 'labour' in its most general or commonly used form refers to productive human work. According to Ferns and Ostry (1976), labour is the most muscular element in production, compared to the mental and fundamental elements. It is therefore both a necessary and an inferior element. Labour is one of the most significant issues within the farming business fraternity, and it is not easy for any business to exist without labourers. A labourer can be either an employee or the business owner himself/herself, but for the purposes of this study a labourer is defined as somebody employed by the farm owner.

Above 47% of the respondents were not keeping any labour records and some did not have any employees (Figure 4.3). Of the respondents 19% had only ideas, while 16% had rough and incomplete records and 18% kept neat and thorough records. This leads back to the issue of literacy (level of education), where most small-scale farmers are illiterate.

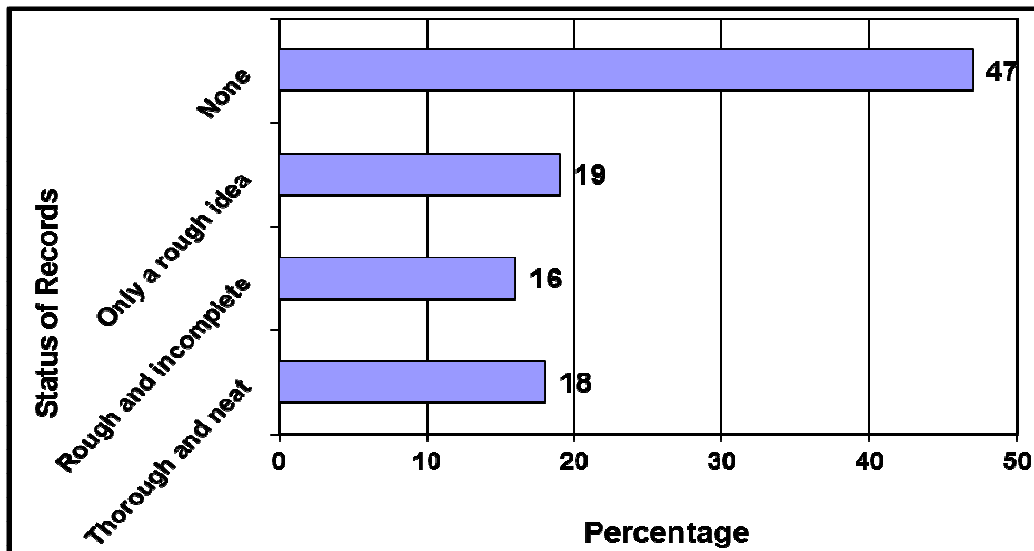


Figure 4.3: Keeping of labour records

4.6.5 Information and training

Access to training and information makes it easier for individual farmers to farm efficiently or successfully penetrate the market. According to Van Schalkwyk *et al.* (2003), agricultural data plays a very important part in the decision-making process of both private and public decision-makers when one considers that sound economic information improves the competitiveness and the efficiency of markets.

A total of 87% of the respondents indicated that they do attend information and training workshops when these are held, while 13% had never attended even a single information or training workshop (Figure 4.4).

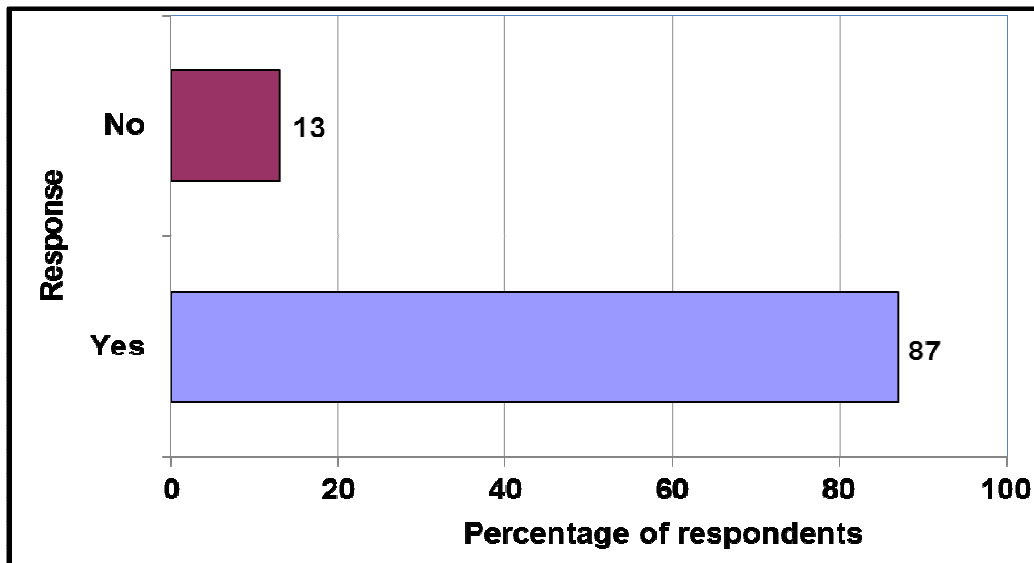


Figure 4.4: Information and training response

The reason for this is that some of the respondents had not been properly informed about these training workshops. The main problem that arises when such farmers have to sell their products is that they have insufficient knowledge to price their products according to their true value. As a result, most are underpaid for their products, especially when it comes to livestock.

4.7 RESOURCES

4.7.1 Extension services

Extension officers giving technical assistance are regarded as the backbone of any successful farming venture. Without proper guidance, it is highly unlikely that small-scale farmers can succeed in their endeavours. In Qwaqwa the success of the farmers lies within the reach of extension officers, but the study revealed that there is a lack of visitation by extension officers. Most of the respondents (about 47%) had never been visited by an extension officer, which raises questions about the quality and availability of extension officers in this region (Figure 4.5). A total of 26% of the respondents were going two months or more without being visited by an extension officer, while a mere 1% was receiving such visits once a week.

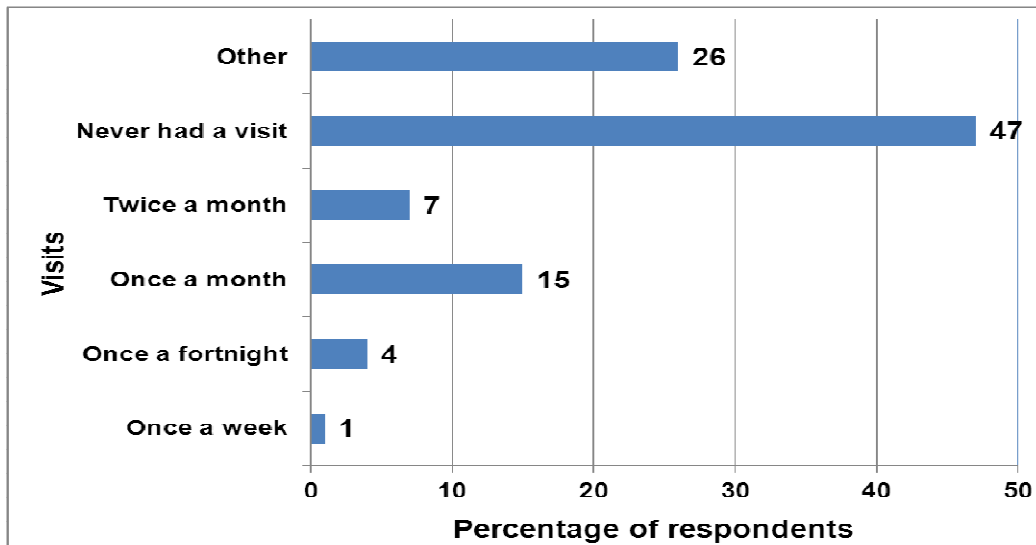


Figure 4.5: Visitations by extension officers according to respondents

The majority of small-scale farmers continue to struggle due to the fact that most were fully dependent on governmental assistance in the past, but things have changed since the incorporation of the former homelands into South Africa and the deregulation of the markets. Moreover, co-operative technical assistance does play a minimal role in educating farmers in this region, although any changes they make are minor. There is therefore an urgent need for improved technical assistance in order to assist in the development and success of these farmers, as they can play a significant role in the development of the region and the province at large.

Other points or questions that can be raised are the following: Do the extension officers have the necessary understanding and knowledge to assist or help the small-scale farmers to succeed? Do the extension officers fully understand what they should do for the farmers or what they should provide them with? These are just some of the questions that need to be addressed, and as such they were included in the questionnaire. Thirty five percent of the respondents believed the quality of governmental technical assistance to be either poor or very poor, whereas more than 47% were unable to respond due to the fact that they had never had a single visit from an extension officer (Table 4.14). Less than 30% of respondents gave responses of satisfactory, very good or excellent.

Table 4.14: Perception of farmers on the knowledge of extension officers

<i>Perceptions</i>	<i>Number</i>	<i>Percentage (%)</i>
Excellent	8	8
Very Good	3	3
Satisfactory	9	9
Poor	11	11
Very poor	22	22
Never had a visitation	47	47
Total	100	100

The demand for government extension officers in Qwaqwa is very low as the majority of farmers believe that private or 'co-op' extension officers are better than government officers. Table 4.15 below shows the demand for extension officers.

Table 4.15: Demand for extension officers by farmers

<i>Category of extension officers</i>	<i>Percentage (%)</i>
Government extension officers	9
Co-op extension officers	89
Undecided	2
Total	100

This could explain why small-scale farmers from this region are struggling and there is therefore an urgent need for the training of extension officers so that they can be equipped to deal with any issues they may encounter in their working environment.

4.8 MARKET ACCESS

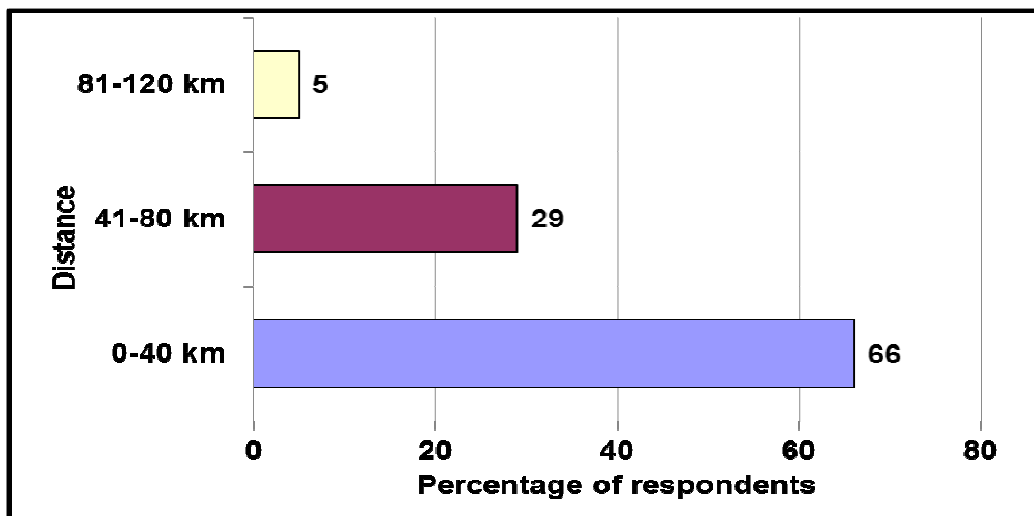
Market access is the ability of farmers to use agricultural markets to sell their products, and it assumes market availability (Makhura and Mokoena, 2003). Based on the statement of Makhura and Mokoena (2003) it shows that for a business to be successful, it must have easy access to markets. No business can achieve its objectives if it is faced with a lack of access to markets.

4.9 DISTANCE TO MARKETS

It is a long journey for farmers in Qwaqwa to get their products to markets, even though some of the farmers sell their livestock within the area. Because of the farmers' poor access to markets, they sell their livestock within the community very cheaply. According to farmers, they rely on the community to buy their livestock for use at funerals, the unveiling of tombstones, weddings, birthdays, parties, etc.

The survey results reflected the distances to markets, which range from 0 to 120 km (Figure 4.6). Apart from selling to the community, farmers sell to the accessible markets. Above 66% of the respondents had to travel between 1 and 40 kilometres; 29% had to travel between 41 and 80 kilometres and 5% had to travel between 81 and 120 kilometres to sell their products.

Figure 4.6: Distance to markets in kilometres



Farmers in this region cannot easily access the market due to a lack of infrastructure, e.g. bad roads, lack of their own transport, lack of market information in terms of pricing, etc.

4.10 CONCLUSION

The main reason for this chapter was to analyse the descriptive data that was collected in Qwaqwa using a questionnaire. It also generated a number of hypotheses dealing with factors that may influence or hinder the success of small-scale farmers, especially in light of the fact that they remain dependent on governmental assistance instead of doing things on their own.

To gather all this data, a questionnaire was developed and tested before it was used for the study as a way of minimising measurement error. Therefore the main aims of pretesting were to identify sources of potential non-sample error, the effect the interviewer has on responses to questions, errors the respondent makes due to the way questions were worded, errors due to the method of delivery or errors caused by sequencing, and errors caused by the interaction of these factors.

Within the factors listed – demographics, land and agriculture, human capital, infrastructure and capital, resources and distance to markets – there are problems that can be highlighted as the ones causing the poor performance of many farmers in Qwaqwa. One such problem is the issue of poor farm management, which will be focused on in other chapters as well. Also it has emerged that many small-scale farmers in Qwaqwa do not spend time planning ahead; they just decide to farm based on their previous knowledge as they were employed in farming businesses before.

Another problem seems to be that they base their farming activities on what they think is good for their farming business. Very few farmers state that they took soil samples in order to decide what to farm; others farm livestock, crops or a combination of both livestock and crops because they prefer these types of farming (even though their soils are not suitable for livestock but suitable for crops, or vice versa). It can be concluded that poor farming practices will continue as long as there are no drastic actions implemented to assist farmers in Qwaqwa. There is certainly a great need for governmental intervention within the farming communities in Qwaqwa. Once all the stakeholders are

involved in this region, farmers will be able to contribute towards the economy of their region, which will be good for the whole country. The next chapter will provide a broad overview of the methodologies used in this study.

CHAPTER FIVE

DESCRIPTION OF VARIABLES AND METHODOLOGY USED

5.1 INTRODUCTION

Small-scale farming in South Africa is faced with a lot of constraints that inhibits it from realising its potential. Marketing and production levels have dropped drastically, especially in the former homeland states. Even though the Integrated Sustainable Rural Development Strategy of the South African Government identifies livestock farming as the agricultural enterprise with the most likely chance of improving household food security and addressing poverty alleviation in small-scale communal farming areas of South Africa, not much has changed since 1994 (NDA, 2005). This continued underperformance of small-scale farmers in South Africa endorses close examination of this sub-sector.

Paterson (1997) stated that for the farmers to be successful, the situation of a perfect market should prevail, implying that there have to be many buyers, many sellers, defined products, market place and market organisation. Other authors and researchers including Bekele (2003), Doss (2006), Uematsu and Mishra (2010), Najafi (2003), Magingxa (2006), Randela (2005) and Nell (1998) mention various constraints faced by farmers and characteristics that can assist them to positively influence the success potential. These ascribable characteristics include facets such as leadership, knowledge, information, etc. Analysing these characteristics will assist in better understanding the farmers.

The first section of the chapter presents a discussion of the methodology that was used, and also describes how farmers were divided into two groups based on the above-mentioned ascribable characteristics (such as leadership,

knowledge and information). It therefore assesses the influence that these factors have on the potential for farmers to be more successful.

5.2 METHODOLOGY

In this chapter, farmers are divided into two groups, namely more successful (MS) and less successful (LS) farmers. This chapter mainly focuses on the characteristics that determine whether farmers will be more successful or not. Importantly the influence of diverse factors on success is analysed and principle components are formed that provide us with the fundamental assumptions underlying an explanation as to why there are more and less successful farmers. Therefore the proficiency employed in this chapter furnishes categorical variables that can be used in further analysis (based on the results of the cluster analysis, where the result from the cluster analysis is used as a proxy). A logit model is used to determine which of the principle components have the greatest consequence for the success potential of the small-scale farmers in Qwaqwa.

Before explaining the methodology, bear in mind that the K-means cluster analysis technique was adopted in dividing farmers into two groups based on the factors determining farming success for meaningful results as discussed earlier. According to Sambamoorthi (undated), cluster analysis is a collection of statistical methods which identify groups of samples that behave similarly or show similar characteristics; in common parlance it is also called 'look-alike groups'. Magingxa (2007) states that the purpose of cluster analysis is to panel a set of objects into two or more clusters so that the objects within a cluster are comparable and objects in different clusters are dissimilar.

Following Kaufman and Rousseuw (1990), there are two types of distance measurements being performed, depending on the type of variable. For N observations to be clustered into K groups:

The Euclidean distance d_{jk} between rows j and k is computed using:

$$d_{jk} = \frac{\sqrt{\sum_{i=1}^P \delta_{ijk}^2}}{P} \dots\dots\dots[1]$$

The Manhattan distance d_{jk} between rows j and k is computed using:

$$d_{jk} = \sum_{i=1}^P |\delta_{ijk}| \dots\dots\dots[2]$$

Where for interval, ordinal and ratio variables:

$$\delta_{ijk} = z_{ij} - z_{jk}$$

And for asymmetric-binary, symmetric-binary and nominal variables:

$$\delta_{ijk} = 1 \text{ if } x_{ij} \neq x_{jk}$$

$$0 \text{ if } x_{ij} = x_{jk}$$

With the exception that for asymmetric-binary, the variable is completely ignored (P is decreased by one for this row) if both x_{ij} and x_{jk} are equal to zero (the non-rare event). The objective function D is the total distance between objects within a cluster and it is represented as follows:

$$D = \sum_{k=1}^K \sum_{ieC_k} \sum_{jeC_k} d_{ij} \dots\dots\dots[3]$$

5.2.1 Discussion on cluster analysis

There are 17 explanatory variables that were selected for analysis and they are as follows: gender, age, labour record keeping, technical assistance, access to credit, leadership skills, distance to market, transport costs, training, financial record keeping, and access to information, infrastructure, technical

inputs for livestock, level of education, and technical inputs for crops, farm size, and farming experience.

After initially running the data through the clustering tool, the results of the adumbration showed that the appropriate number of clusters that can be obtained is two. Therefore further analyses are carried out with these two clusters of less successful (LS) and more successful (MS) as shown in Table 5.1 based on their individual characteristics and their potential to be more successful and overcome any constraining factor. According to Nell and Napier (2005) successful farmers must be able to assess the future, be able to create and sustain competitive advantages and identify opportunities before competitors do. Based on that, it imputes to facets such as leadership skills, access to credit, farming experience, etc. It is therefore believed that examining these characteristics will lead to a better understanding of the farmers involved in small-scale farming.

Table 5.1: Cluster centroids

<i>Variables</i>	<i>Cluster 1: Less Successful (LS) Farmers</i>	<i>Cluster 2: More Successful (MS) Farmers</i>
Gender	0,151	0,29
Age	0,842	0,69
Labour record keeping	-0,253	1,256
Technical assistance	0,256	0,566
Access to credit	0,911	0,861
Leadership	0,153	0,461
Distance to market	0,312	-0,0124
Transport costs	0,561	0,568
Training	0,1789	0,3561
Financial record keeping	0,256	0,8925
Information	-0,145	0,356
Infrastructure	0,425	1,2301
Technical inputs for livestock	0,236	0,33
Level of education	0,0896	0,234
Technical inputs for crops	0,142	0,264
Farm size	-0,8924	0,251
Farming experience	0,652	0,336
Number of cases in each cluster	89	65

The centroid in each cluster represents the average characteristics of farmers in the clusters.

5.2.1.1 Cluster 1: Less successful farmers

This cluster is represented by eighty-nine observations and can be considered as representatives of the less successful (LS) farmers. Because most of the variables in this cluster, which are considered to positively influence the success potential of small-scale farmers, do not favour the expected factors to determine the success of farmers.

Despite showing a big positive gap in terms of farming experience and training, these small-scale farmers are largely not accessing enough market information. Thus, it can be contended that as long as the farmers are not well equipped with recent marketing information during training, the excessive lack of information can be futile. Therefore when both market information and training are well organised and combined they can result in the positive development of farmers, and can enable them to understand and know clearly what is needed from them.

Should farming experience, training and market information be tightly combined, positive results can be achieved. According to FAO (2001), the following considerations are applicable:

- *Access to timely information about prices and quantities plays a crucial role in reducing the risk of losing money on a market transaction. High risks lead to high marketing costs, as high margins are necessary to compensate for possible losses. In extreme cases, farmers with information can decide whether or not to harvest, so avoiding sending produce to market in times of glut only to discover that the price received does not cover harvest, packaging and transport costs.*
- *Accurate and timely information should reduce the cost of food marketing. However, information cannot be perfect. Firstly, prices move too rapidly for available information to serve as more than a guide to*

likely returns. Secondly, the costs of improving information have to be offset by the additional benefits. Even when more precise information can be obtained, it might be too costly to obtain. This implies that those involved in marketing will always have to take decisions based on varying degrees of imperfect information.

In this cluster a group of farmers scored less with regard to decisive characteristics such as financial record keeping and leadership, which are very important in determining the success of the business. On top of that, this group is also less educated as compared to their peers. Even though these farmers received more training than the other group, there was poor information disseminated to them. The point is that irrespective of how much training farmers receive, if the information they are receiving is not up to date then training is not useful. Even though farmers in this cluster had more farming experience than the others, lack of access to information could contribute to their struggle to access markets.

5.2.1.2 Cluster 2: More successful farmers

Even though in the representative centroids, the experience of the more successful farmers is rated lower than that of the less successful (LS) farmers, the centroids for more successful (MS) farmers indicate that most of them have better education levels. As discussed in Chapter Two, education improves access to information and knowledge that are beneficial to the farming operation. It also leads to awareness of the possible advantages of modernising agriculture by means of technological inputs; it enables farmers to read instructions on fertilizer packs, and diversifies household incomes which, in turn, will enhance households' food supply.

Farmers in this group score positively in most critical characteristics that are associated with successful farming. These characteristics include technical assistance, leadership, financial record keeping, information, infrastructure and training. Financial record keeping helps farmers to plan properly, as they are aware of how much cash flow they have generated and what they have

spent on which resources or farming needs, which helps them in decision-making. Accessing updated and good information helps MS farmers to plan properly at all times as compared to the LS farmers. The advantages MS farmers possess help them to achieve better results for the farming businesses.

Again MS farmers have more access to technical assistance than the LS farmers. This gives them an advantage in terms of accessing more advice given to them by technical assistants (previously known as extension officers) and they find it easier to access more information as to what is expected from them as farmers by the consumers. Moreover this group received more training. This is important in terms of planning, marketing, producing and leading the business to an event that accomplishes its intended purpose.

5.2.2 The Model

Logistic regression has been used in past studies on, for example, market access, livestock marketing and the adoption of technology (Feder, Just and Zilberman, 1985; Kleinbaum, 1994; Lin, 1995; Nell and Schwalbach, 2002; Haile, Alemu and Kundhlande, 2005; and Montshwe, 2006). Therefore the logistic regression model was adopted for the purposes of this study to determine ways and means of overcoming the factors or constraints faced by small-scale farmers in Qwaqwa, as shown below:

$$\phi_i = E(y_i = 1 / X_i) = \frac{1}{1 + e^{-\left(\beta_0 + \sum_j \beta_j x_{ij}\right)}} \dots\dots\dots [1]$$

Where: ϕ_i stands for the probability of the small-scale farmer i having access to markets, y_i is the observed market access of the small-scale farmer i , x_{ij} are factors determining market access for the small-scale farmer i , and β_j stands for the parameters to be estimated.

Denoting $\beta + \sum_{j=1}^{k=n} \beta_{ij}$ as Z equation 1 can be rewritten to give the probability of market access by the small-scale farmer i as:

$$\phi_i = E(y_i = 1 / X_i) = \frac{1}{1 + e^{-z_i}} \dots \dots \dots [2]$$

From equation 2, the probability of the small-scale farmer i not having access to the market is given by $(1 - \phi_i)$ which gives equation 3, which can be written as follows:

$$(1 - \phi_i) = \frac{1}{1 + e^{z_i}} \dots \dots \dots [3]$$

Therefore odds ratio, i.e. $\phi_i / (1 - \phi_i)$ is given by equation 4 as:

$$\left(\frac{\phi_i}{1 - \phi_i} \right) = \frac{1 + e^{z_i}}{1 + e^{-z_i}} = e^{z_i} \dots \dots \dots [4]$$

The natural logarithms of equation 4 give rise to equation 5:

$$\ln \left(\frac{\phi_i}{1 - \phi_i} \right) = \beta + \sum_{j=1}^{k=n} \beta_{ij} + \varepsilon_i \dots \dots \dots [5]$$

Rearranging equation 5, with the dependent variable (market access) in log odds, the logistic regression can be manipulated to calculate probabilities as

$$\phi_i = \frac{e^{\left(\beta_o + \sum_{j=1}^{k=n} \beta_j x_{ij} \right)}}{1 + e^{\left(\beta_o + \sum_{j=1}^{k=n} \beta_j x_{ij} \right)}} \dots \dots \dots [6]$$

Once the conditional probabilities have been calculated for each sample farmer, the ‘partial’ effects of the continuous individual variables of small-scale farmers’ market access can be calculated by the expression

$$\frac{\partial \phi_i}{\partial x_{ij}} = \phi_i (1 - \phi_i) \beta_j \dots\dots\dots [7]$$

The ‘partial’ effects of the discrete variables are calculated by taking the differentiation of the probabilities estimated when the value of the variable x is set to 1 and 0 ($x_i = 0, x_i = 1$), respectively.

Attempting to fit equation 5 for the first time using the maximum likelihood procedure failed. This was attributed to multi-collinearity, as can be observed by studying the correlation coefficient matrix.

In solving the multi-collinearity problem, it was necessary to compress the related variables into fewer unrelated principal components. This technique is referred to as Principal Component Analysis (PCA). PCA is a technique used to reduce the dimensionality of data while retaining as much information as possible.

The correlation matrix C, using both unstandardised and standardised variables, was used to calculate eigenvalues $\lambda_1, \lambda_2, \dots, \lambda_k$ and corresponding eigenvectors v_i , respectively as:

$$|C - \lambda I| = 0, |C - \lambda_j I| v_j = 0 \dots\dots\dots [8]$$

The eigenvectors v_j were then arranged to give matrix V in equation 9.

$$V = \begin{bmatrix} v_{11} & v_{12} & \cdot & \cdot & \cdot & v_{1k} \\ v_{21} & v_{22} & \cdot & \cdot & \cdot & v_{2k} \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ v_{k1} & v_{k2} & \cdot & \cdot & \cdot & v_{kk} \end{bmatrix} \dots\dots\dots [9]$$

The matrix V is orthogonal as its columns satisfy the conditions $v'_i v_i = 1$ and $v'_j v_i = 0$ for $i \neq j$.

The principal components (Z) are calculated as:

$$Z = X^s V \dots\dots\dots [10]$$

Where X^s is an $n \times k$ matrix of standardised variables, and V is the eigenvector matrix as defined in equation 10. There are k principal components as there are k variables. These new principal components, unlike the original variables, are orthogonal i.e. they are uncorrelated.

Once the principal components (PCs) were calculated, equation 10 was fitted to determine PCs having a significant impact on the probability of success:

$$\text{Ln} \left(\frac{\phi_i}{1 - \phi_i} \right) = a_o^s + X^s V V' \phi^s + \varepsilon \dots\dots\dots [11]$$

Magingxa (2006) alluded that there are several methods that can be used in choosing the number of principal components in PCA:

- One criterion is to use the scree plot of the eigenvalues;
- Secondly, a certain percentage of variability to be accounted for can be set. The idea is to keep enough factors so that this variation is achieved; and
- Thirdly, the method which involves using a cut-off value of 0.7 when PCA is conducted with correlations. This means that all factors with corresponding eigenvalues less than 0.7 are dropped for further analysis (Magingxa, 2006).

A criterion used quite commonly is to eliminate all components whose eigenvalues are less than 1.0 on the grounds that these components account for less of the total variance than any one variable (Kaiser, 1959). This is the rule of thumb when conducting PCA using a correlation matrix (Jolliffe, 1986). But according to Smith (2002) if you like, you can decide to ignore the components of lesser significance, and you do lose some information; but if the eigenvalues are small, you don't lose much. Smith further states that if

you leave out some components, the final data set will have fewer dimensions than the original. Therefore in this study, it was decided not to leave out any components with corresponding eigenvalues of less than one. Analysis and discussion of the PCAs will be presented in Chapter Six.

5.3 SELECTION OF VARIABLES

A large number of explanatory variables were considered for this study and the most important variables were eventually selected. Most of the variables included for the study were adopted from Chapter Two, others from existing studies (Montshwe, 2006; Magingxa, 2006; Magingxa, Alemu and Van Schalkwyk, 2006; Haile, Alemu and Kundhlande, 2005; Jordaan, 2003; Jordaan and Jooste, 2000; Nell, 1998 and Hosmer and Lemeshow, 1989) and from the additional experience. Selected variables for analysis and their measurements are shown in Table 5.2. The proxy for the determination of farming success was developed around the response as to whether farmers were able to succeed in selling their products and also achieving their objectives.

Table 5.2: Variables and measurements

<i>Variables</i>	<i>Measurement</i>
Gender	Male=1, Female=0
Age	Years
Marital status	Single=1, married=2, divorced=3, widow/widower=4
Labour	Number of labourers
Technical assistance	Times per year
Access to credit	1=Yes; 0=No
Distance to market	kilometres
Transport costs	Rands
Training	1=yes; 0=no
Financial records	1=yes; 0=no
Information	1=yes; 0=no
Infrastructure	1=Good; 0=Poor
Technical inputs for livestock	1=Yes; 0=No
Level of education	Grades
Technical inputs for crops	1=Yes; 0=No
Farm size	hectares
Farming experience	Years

The following selected variables were included in the analyses, viz.: gender and age of the farmers; number of labourers they employ if they do; whether

farmers receive assistance from extension officers; access to credit; distance from their farms to the nearest market; transport costs; whether farmers received training or not; whether they keep any financial records; whether they have access to information; the status of infrastructure on and around their farms; whether they have access to technical inputs for both livestock and crops; their farm size and farming experience.

5.3.1 Variables included in the study

It is possible to classify and use some of the variables either as continuous or as categorical variables, depending on how a variable is approached or measured (Nell, 1998). For instance, extension visits can be classified as a continuous variable if the number of extension visits per year is measured or as a categorical variable if the researcher is only interested in whether the farmer received extension visits or not (Nell, 1998). Based on the literature review presented in Chapter Two, the variables below will be used in order to determine their contribution to poor development and lack of access to markets by small-scale farmers in Qwaqwa; these should therefore aid in devising ways to overcome the constraints faced by small-scale farmers. All variables (as indicated in Table 5.2) were sub-divided into the following six categories or sections:

5.3.1.1 Demographic information

- **Gender**

Gender is based on the sex of farmers, meaning that they are either male or female. It is very crucial that sex or gender of participants is determined due to the fact that in most cases women are more involved in the production but males are the main decision makers.

- **Age of the farmer**

The age of the farmer is measured based on the number of years the farmer has lived until the day the study was conducted. It is important to understand the elderly population's role in agricultural production, as this has implications

for the well-being of elders as well as the national agricultural sector (Woodsong, 1994).

- Marital status of the farmer

Marital status will be included as a variable that helps to define family units, to show the impact of a family that has two adults as compared to a family that has only one adult. Kiriti and Tisdell (2004) found that households of married women seem to suffer more in terms of reduced food availability than households headed by females; husbands have control over cash income and therefore influence food purchases and they are less likely than females to use the cash for food purchases and tend to spend the cash on themselves, thus reducing food availability to family members.

- Educational level

This is measured in terms of the highest standard or grade the farmer has achieved in formal training or education.

5.3.1.2 Land and Agriculture

- Soil type

The soil type or texture variable is a measured of the understanding and/or knowledge of farmers as to whether the soils they are farming are suitable for the type of product they are producing.

- Size of the farm

It is also important to determine the size of the farm as a way of measuring the level of production. For example, we should determine the carrying capacity of the land by comparing large stock units to small stock units. According to Nell (1998), the number of small ruminants can be linked to their feed intake to compute the grazing area used.

5.3.1.3 Human capital endowments

- Farming experience

The level of farming experience is based on the number of years the farmer has worked as a farmer and the type of farming as a specific enterprise, e.g. livestock, crops or mixed (both livestock and crops).

- Management and planning skills

The management and planning skills measurement is based on the capacity of farmers in terms of managing their business, marketing, handling finances, human resource management, etc. The appropriate 'bundle' of skills and competencies will of course depend not only on the type of business, but also on its stage of development.

5.3.1.4 Infrastructure and capital

- Financial management

Financial management and recordkeeping are measured in terms of knowledge, skills and understanding of the importance of finance in the business, and the way records should be kept as a means of having an idea of whether you are making a profit or not.

- Access to credit

Access to credit is based on the access of farmers to financial institutions, either private or governmental, and loan approvals. According to Ahmed, Peerlings and Van Tilburg (2005) and Machete (2004), credit is regarded as one of the crucial factors determining the availability of both production and marketing inputs.

- Access to information and training

Access to information is a prerequisite for small-scale farmers to adopt new agricultural techniques and also to access broad information as a way to improve their businesses and achieve good prices. Access to information is

classified as a variable that measures access to general information related to agricultural production.

5.3.1.5 Resources

- Technical assistance

Technical assistance is one of the variables indicating the technical assistance of small-scale farmers by institutions. Agricultural technical assistance is one of the institutional support services that have a central role to play in the transformation process. Technical assistance is the process that helps farmers to become aware of improved technologies and adopt these in order to improve their efficiency, income and welfare (Purcell and Anderson, 1997). It is measured by the number of extension visits and also by the quality of their assistance to farmers in Qwaqwa. According to Musewa, Chagwisa, Sikuka, Frazer, Chimoyo and Mzileni (2007), technical assistants can play a role by using the recent extension approach of participatory rural appraisal through discussion with farmers, and by empowering the farmers to identify marketing problems and their solutions.

5.3.1.6 Market access

- Market access

Market access is a variable that plays a crucial role in enabling farmers to sell their products, and it plays a major role in the development and success of all businesses. According to Minten (1999), good market access is one of the factors that influence price levels. According to the World Bank (2007), one important route to reducing poverty in rural areas is to enhance the market participation of rural farmers, as this can increase the net returns of agricultural production. Getting accurate and adequate information to proper sales channels and providing the market with the means and confidence to make a purchase decision does enhance opportunities for market access.

- Market distance

Market distance is defined as the sum of all factors and costs that are incurred by selling products; from the farm gate to the foreign market. Ouma *et al.* (2003) mentioned that the impact of distance, which requires the transport of cattle to markets (just to mention few), results in imperfectly and inefficiently integrated markets. It also reduces the producer's profit margin as a result of high transaction costs.

5.4 CONCLUSION

Knowing what factors impact negatively on the success of small-scale farmers has become a point of interest. Many researchers and scientists have researched the issues and most of them got similar results. Magingxa (2006) mentioned that these are individual characteristics of the farmer and affect the way a farmer conducts his business.

Most of these constraining factors were mentioned in the literature review. Therefore data was run initially through the clustering tool and the results of the adumbration showed that the appropriate number of clusters that can be obtained is two. Therefore further analyses were carried out with these two cluster centroids. Cluster 1 was the less successful and Cluster 2 was the more successful farmers. More successful farmers tend to be better in aspects such as leadership, financial record keeping, access to information, level of education, training and access to technical assistance.

In addition it is also imperative that we define the variables and methods that are used in a study as it will provide us with a broad knowledge and idea of what is contained within the study, how it was analysed and how we got to the conclusions of the study. Therefore a variable was defined as any aspect of a theory that can vary or change as part of the interaction within the theory. In other words, based on the literature review, variables were regarded as anything that can effect or change the results of a study. Therefore every study has variables as these are needed in order to understand differences.

Bursac, Gauss, Williams and Hosmer (2007) states that *“the criteria for inclusion of a variable in the model vary between problems and disciplines. The common approach to statistical model building is minimization of variables until the most parsimonious model that describes the data is found which also result in numerical stability and generalisability of the results. Some methodologists suggest inclusion of all clinical and other relevant variables in the model regardless of their significance in order to control for confounding. This approach, however, can lead to numerically unstable estimates and large standard errors”*.

CHAPTER SIX

ANALYSIS OF FACTORS THAT LIMIT THE SUCCESS OF SMALL-SCALE FARMERS

*Happiness is not an absence of problems,
but the ability to deal with them.*
– H. Jackson Brown.

6.1 INTRODUCTION

The importance of mainstreaming farmers and overcoming their constraints has been the subject of the previous discussion and the main reason for this study. In this regard, it becomes important therefore to clearly understand the factors that constrain farmers. Understanding and analysing these factors will help in improving the strategies that can be implemented in mainstreaming small-scale farmers so that they become successful commercial farmers in the future.

As previously discussed there are many factors that contribute to the poor performance of farmers such as the lack of market information, transportation costs, poor access to credit, the unavailability of technical assistance or extension services (number of visits per year), inadequate training, the farmers' age and gender, infrastructure, level of education, farm size, etc. Based on this background, the purpose of this chapter is therefore to provide details and results of the analysis of factors constraining and/or limiting the success of small-scale farmers in Qwaqwa.

6.2 RESULTS AND DISCUSSION

There are various methods that are used when choosing the number of principal components in PCA. Using the scree plot of the eigenvalues is one of the criteria used and it is extracted from the correlation matrix. Therefore in

this study the number was decided by leaving out components with corresponding eigenvalues of less than one. This is the rule of thumb when conducting PCA using a correlation matrix as already mentioned. This is so because an eigenvalue corresponds to the number of variables in a factor and the sum of the eigenvalues corresponds to the total number of variables.

Therefore the initial variables (Xs) were grouped into six principal components, altogether accounting for 88.72% of variability. All the results of the exercise described above with corresponding eigenvalues after Varimax rotation are shown in Table 6.1 below. Rotation is a procedure that involves the redeployment of the variation for the different variables between components, such that each variable is more or less clustered in one component rather than spread throughout the components.

Table 6.1: The principle components and their eigenvalues

<i>Variables</i>	<i>PC₁</i>	<i>PC₂</i>	<i>PC₃</i>	<i>PC₄</i>	<i>PC₅</i>	<i>PC₆</i>
Gender	0.023	0.321	0.062	0.341	0.141	-0,658
Age	0.095	0.402	0.056	0.162	0.002	0.649
Labour	0.135	0.214	-0.686	0.025	0.042	0.162
Technical assistance	0.842	0.155	0.182	0.684	0.751	0.131
Access to credit	0.188	0.742	0.217	0.402	0.032	0.061
Distance to market	-0.641	0.216	0.834	0.242	0.039	0.015
Transport costs	-0.657	0.210	0.575	0.046	0.053	0.114
Training	0.872	0.314	0.024	0.048	0.041	0.054
Financial records	0.302	-0.648	0.130	0.092	0.100	0.014
Information	0.796	0.211	0.062	0.08	0.671	0.175
Infrastructure	-0.827	0.119	0.135	0.752	0.103	0.233
Technical inputs for livestock	0.133	0.159	0.215	0.135	0.635	0.107
Level of education	0.124	0.680	0.039	0.111	0.024	0.009
Technical inputs for crops	-0.101	0.046	0.082	0.106	0.572	0.108
Farm size	0.213	-0.007	0.004	0.102		0.627
Eigenvalue	3.315	3.002	2,639	2,042	1,804	1,009
% Variability	25.36	19.42	17.19	10,72	8.97	7,06

The first principal component, PC₁, accounts for 25.36% of variability, while PC₂ through to PC₆ account for variability from 19.42% to 7.06%, as can be seen in Table 6.1. For the purposes of clarity, and after careful consideration, values of factor loadings below 0.5, in either direction, were dropped from the analysis. Analysing the direction (the sign of the component loading) and

strength (the value of the component loading) of the relationships between the components and the initial variables (as shown in Table 6.1) allows us to interpret the results.

Having proper training that is supported by good market and production information and the availability of technical assistants (previously known as extension officers) improves the chances of overcoming any constraint(s) that hinder the potential success of farmers. As these components have a positive relationship with PC₁, this could therefore be interpreted as **production capability**. It can be stated that in order for farmers to be more successful, they should have access to these components. What now becomes a concern is that infrastructure, distance to markets and transport costs might hinder the success of these farmers. However, what is positive is that farmers have access to credit even though some of them are reluctant to borrow because of previous experiences and what they have heard from other farmers.

The second principal component (PC₂) has 'a fixed relationship' with access to credit and education. Financial backing is the backbone of every business venture. It can therefore be interpreted as the **financial skills**. It is not possible for farmers to continue farming without an adequate financial back-up. This will help livestock farmers to buy vaccinations, fodder, lucerne, etc. (especially since Qwaqwa is known for livestock farming), and on the other side it helps crop farmers to buy inputs such as fertilizers, seeds, herbicides, pesticides, etc. It is no surprise therefore that this has strong negative relationship with financial record keeping – over 40% of the farmers stated that they do not have any financial records (income and costs records) and this makes difficult for them to access finance even though it is available.

PC₃ has a strong positive relationship with controlling transport costs, distance to markets and access to markets. This could therefore be interpreted as reflecting **physical access to markets**. PC₃ concerns the opportunity and possession of the qualities required to do something even if the situation does not permit or allow it. The majority of these farmers rely heavily on public transport to move their products or outputs from the farm

gate to the market. A few of them do have their own transport which they sometime make it available to their fellow farmers when they are requested to do so. Labour costs become a problem because they are always escalating during certain seasons, especially for livestock farmers, who have to employ shepherds.

Good technical assistance and improved infrastructure are some of the contributors that can help to ease constraints that are faced by small-scale farmers. This can help them to sell their products in accessible markets provided they have quality products. Both of these have positive relationship with PC₄. This could therefore be interpreted as reflecting **optimal resource use**. It is difficult for farmers to improve or develop without receiving assistance and having optimal infrastructure. Their ability to use whatever available resources can improve their access.

PC₅ shows a positive relation with technical assistance and both technical inputs for crops and livestock. To have this positive relations indicates or means that advice helps. That means whatever good assistance, either information or advice can be beneficial for the small-scale farmers to achieve their farming success and improve their ability to manage. And this will improve their skills and this can therefore be interpreted as **managerial skills**.

Finally, PC₆ shows a firm positive relationship between the farmers' age and farm size. A positive relationship with age exists, indicating that higher ages do affect the ability to manage farms. Therefore this component can be interpreted as **experience gained and scale of operation**. It is no surprise that this has a negative relationship with gender because gender can be ascribed to African tradition, which generally dictates that men, not women, should have a bigger influence on the management of farms businesses. However, men are not always around for much needed decision making, which help to explain why farmers fail to produce quality products and to attract more funding for their businesses.

6.3 INFLUENCE OF DERIVED COMPONENTS DETERMINING FARMING SUCCESS

Once the principal components were ascertained, it was important to conduct the regression analysis with the aim of studying how the estimated components influence the small-scale farmers' farming success. The previously described estimated components served as explanatory variables and their values were the component scores (the score of each variable within the component). The component scores are scaled in such a way that they have a variance of one and a mean equal to zero.

As discussed in both Chapters One and Two, a logit model was applied to ascertain the effect of the six components identified earlier with regard to the small-scale farmers' farming success. The model was chosen because of the dichotomous nature of the dependent variable (i.e. farming success). The following logit model was used to determine the influence of the six principal components on the success potential of smallholder irrigators:

$$\text{Log}\left(\frac{P_{(y=1)}}{1-P_{(y=1)}}\right) = \alpha_0 + \sum_{i=1}^n \alpha_i \chi_i \text{ or as } \left(\frac{P_{(y=1)}}{1-P_{(y=1)}}\right) = e^{(\alpha_0 + \sum_{i=1}^n \alpha_i \chi_i)} \dots\dots\dots (1)$$

Where P represents the probability of a small-scale farmer being successful, y represents more successful and χ_i is the set of explanatory variables determining small-scale farmers' farming success. The logistic regression is a mathematical modelling approach that can be used to describe the relationship between several Xs and a dichotomous dependent variable (Kleinbaum, 1994). He further states that other modelling approaches are possible but logistic regression is by far the most popular. The results of the logistic regression are show or reported in Table 6.2.

Table 6.2: Logistic regression of variables constraining small-scale farmers

<i>Variables</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T-ratio</i>	<i>Probability</i>
Production capability (PC ₁)	0.764	0.248	3.081	0,023**
Financial skills (PC ₂)	2.648	0.561	4.720	0,014**
Physical access to markets (PC ₃)	1.841	0.541	3.403	0,006*
Optimal resource use (PC ₄)	0.768	0.262	2.931	0,103***
Managerial skills (PC ₅)	-0.135	0.235	-0.604	0.536
Experience gained and scale operations (PC ₆)	1.640	0.513	3.197	0.104***
Constant	0.549	0.472	1.163	0.134

*=significance at 1%, **=significance at 5%, ***=significance at 10%

The model has a 79% goodness of fit. This can be considered a good result considering the complexity of the research object and the layout of the factors that constrain or affect small-scale farmers' farming success. As indicated in Table 6.2, PC₅ and Constant term are not significant. PC₃ is significant at a 1% level of significance. PC₁ and PC₂ are significant at a 5% level of significance and PC₄ and PC₆ are significant at the cut-off point of 10% level of significance.

In this kind of discussion it is best to focus on statistical significance because for the logit model, the estimated coefficients do not have a direct economic interpretation. PC₅ is delineated as managerial skills of the farmers and is based on how they are managing their farms by having good control of their technical inputs for both crops and livestock. The result of the regression indicates that this component does not have a significant input. This can be due to farmers not having good managerial skills even though they did receive good information and assistance from the technical assistants.

The discussion will focus on the components that do have a significant influence on the model. The third component represents the accessibility of the markets by the small-scale farmers. It defines as to whether the markets were accessed by individual farmers or as a joined team. Using a joined transport when collecting inputs and any other points of interest will reduce

farmers' transport cost; especially that majority them rely on their friends and or public transport.

PC₁, production capability, proves to be significant at a 5% level of significance. For example good or valuable information and also having the assistance of the technical assistants can be of a great help to the farmers. In the discussions that were hold with farmers, the majority did not see any importance of the technical assistance because they believe they are of no use to them. Bembridge (1988) articulated critical problems that are faced by extension assistants such as the lack of operational agricultural development policy; the lack of clear objectives in planning extension programmes; poor management of services within departments; poor linkages with research institutions; the lack of adequately trained research staff; technical assistants' dissatisfaction with salaries, housing, transport, general working conditions and training, and the lack of credit facilities. But with the current efforts that are taken by the government, we believe that technical assistants can deliver good assistance to the small-scale farmers all over South Africa.

The second component represents the financial skills and is also shown to be significant at a 5% significant level. It means failure to repay or to have access to finance from financial institutions does have a negative impact on farmers. It is known that credit plays an enormous part in making the farming sector more productive and efficient all over the world. Record keeping is a vital link to the success of any business; good decisions are always based on good information and farming is no exception to this rule (Bennett, 2003). Again shortage of credit availability, or capital constraints, faced by the farmers is one of the major obstacles in the adoption of modern technologies and efficiency improvement in the agriculture sector (Ayaz, Hussain and Sial, 2010). Further more limited access to capital for smallholder farmers and small businesses is a major constraint on rural development in South Africa (Ortmann and King, 2007). In addition credit affects the performance of agriculture in three ways: (i) it encourages efficient resource allocation by overcoming constraints on purchased inputs, and their optimal use; (ii) if agricultural credit is used to buy a new package of technology, for example

high-yielding seed and other unaffordable expensive inputs, it would not only help farmers to move closer to the production frontier, but it would also shift the entire input-output surface; and (iii) credit can also increase the intensity of the use of fixed inputs like land, family labour, and management, persuaded by the 'nutrition-productivity link of credit' (Carter, 1989). But again education plays an important role in a business. Randela *et al.* (2008) maintains that education is conversant with improved business methods.

The fourth component represents what can be termed as optimal resource use. This involves the technical assistants and the infrastructure. The regression results indicate that this component is significant at 10% level of significance. It becomes difficult for farmers to access the outside of the farm if their fare faced with poor infrastructure and not receiving agricultural advices from the technical assistants. The level of information that farmers receive from technical assistants does improve entrepreneurship within the farmers who has just received the farms.

Finally, the sixth component represents experience gained and scale of operations. It is a result of positive interaction between farmer's age and farm size. This component is significant at the 10% level of significance. Farm size sometimes is found to be having and or not having a factor in the business by different researchers. Iglori (2005) found from farms in the Brazilian Amazon that the smaller farms are less efficient. According Thirtle and Holding (2003) larger farms in the UK, the Greek agricultural sector (Rezitis, Tsiboukas and Tsoukalas, 2002), wheat farming in eastern England (Wilson, Hadley and Asby, 2001), and Portuguese dairy farms (Hallam and Machado, 1996) are operating more efficiently than smaller farms. On the other hand, Polish farms greater than 15 ha have lower efficiency than smaller farms (Munroe, 2001). Also for Irish farms (O'Neill, Leavy and Matthews, 2001) and for Philippine rice farmers (Herdt and Mandac, 1981) a negative relationship between farm size and efficiency are found. Morgan and Langemeier (2003) found that the larger farms have, on average, substantially higher profit margins and substantially lower total expense ratios; and in fact, farms in the largest size category, on average, earned an economic profit. It is no surprise that this has

a negative relationship with gender because gender can be ascribed to African tradition, which generally dictates that men, not women, should have a bigger influence on the management of farms businesses.

It can be concluded from the analysis that there are many factors that impact negatively or constrain the success and development of small-scale farmers. Some of these constraints have already been mentioned such as transport costs, finance, access to information, age, technical assistants, etc. These factors have been highlighted by many authors and researchers, who say that they are the ones of the main deciding factors that restrains farmers from producing what is needed or required by the markets. Some of the components were found not to be significant other significant, but they are all considered to be very important in determining the small-scale farmers' access to the markets. Randela (2005) provide an indication that household's ability to process information helps some farmers to better understand and interpret information than others. Also knowledge the farmers possess, ability to think critically and creatively, strong oral and written communication and interpersonal skills, ability to manage the task environment and managing conflict within a business will help in improving the chances to access markets.

6.4 SUMMARY AND CONCLUSION

It has been proven beyond any reasonable doubt that small-scale farmers play a crucial and significant role in the economy of South Africa, and this can also be said about the farmers of Qwaqwa, provided that they overcome their constraints. Therefore to improve farmers' living standards and also to contribute significantly to the economy of their region and South Africa at large, any positive assistance to small-scale farmers is important. Small-scale agriculture is extremely important in achieving the government's development objectives because it directly contributes to household food security through meeting subsistence requirements (Magingxa, 2007).

This chapter attempted to determine the reasons behind the failure of small-scale farmers' farming efforts. Importantly, principal component analysis was executed due to multi-colinearity amongst the variables and it yielded six principal components interpreted as production capability (PC₁), financial skills (PC₂), physical access to markets (PC₃), optimal resource use (PC₄), managerial skills (PC₅) and experience gained and scale of operations (PC₆). These accounted for 88.72% of the variability in the farming success. It should be noted that the total effect of a component is a function of the interactions of the variables within a component (Magingxa, 2007).

Further regression analysis using the principal components as explanatory variables revealed that the most significant components were physical access to markets, production capability, financial skills, optimal resource use and experienced gained and scale of experience. The model has a 79% goodness of fit. PC₃ was significant at 1% level while PC₁ and PC₂ were significant at 5% level; PC₄ and PC₆ were significant at 10% level. These results were in line with the dimensions of success potential described earlier. It should be noted, however, that the total effect of a component is a function of interactions of variables within a component.

To achieve the goals of assisting small-scale farmers to farm successfully, it is therefore important to make sure that the five significant components receive additional or further attention. Providing small-scale farmers in Qwaqwa with necessary advice, especially from technical assistants (extension officers), will assist farmers to reach their objective. Access to good and realistic information from good and reliable sources has been shown to be a critical factor in improving the success or chances of small-scale farmers in marketing. To improve this, farmers need to liaise with the media, but especially with different sources such as farming corporations, technical assistants (extension officers), buyers and/or supermarkets.

The analysis also showed that infrastructural development, farming experience, age and training do have a great depth to positively influence the probability of small-scale farmers' farming success. On the other hand,

outstanding debt, distance to the nearest market, transport costs and farming experience have a negative impact on the probability of small-scale farmers' **farming success**. With regard to outstanding debt, it is by Ahmed, Peerlings and Van Tilburg (2005) and Machete (2004) argued that credit is regarded as one of the crucial factors determining the availability of both production and marketing inputs. That clearly shows that without finance and more debt, small-scale farmers will never be successful.

In conclusion gender relations should not be ignored forever as it has a negative impact on the success and of small-scale farmers and also their ability to farm successfully. That means gender has a high potential in determining their success. It's a known factor that women in Africa are responsible for many farms but at the end they are not the decision makers of the daily running of the business. It is therefore very important that this sensitive issue of gender within the cultural aspects of the African culture is given an attention.

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This is not the end – it is not even the beginning of the end.

But it is, perhaps the end of the beginning.

– Winston Churchill

7.1 INTRODUCTION

This study focused on the constraints and/or factors that hinder the success of small-scale farmers in Qwaqwa. The aim was to assist in mainstreaming farmers to be future commercial farmers. With regard to factors that were found to be responsible for hindering the success of farmers, recommendations were provided as to how to overcome them. The New Institutional Economics (NIE) approach was also visited with the aim of understanding some of the factors that are related to it.

Finally, a general overview of small-scale farmers' constraining factors, as well as a summary and conclusion are presented in the following section. The concluding section proposes some recommendations and finally an outline of possible areas for further research are given.

7.2 SUMMARY

Small-scale farming has shown that it has an important role to play within the agricultural sector – locally, regionally, nationally and internationally. Mabugu and Juana (2005) and FAO (1995) confirm that it has been proven internationally that small-scale farmers and small households play a tremendous role in the development of both developed and developing countries. In South Africa small-scale farming plays a tremendous role in the lives of many rural households as they contribute towards food security (Fraser, Monde and Van Averbek, 2003), and also towards the economic growth of the country (Van Schalkwyk *et al.* 2003; Makhura and Mokoena,

2003; Montshwe, 2004; Gilimani, 2005; Magingxa, 2006; and Duc, 2008). Even though small-scale farmers contribute to the economy, the reality is that they have not yet realised or achieved their full potential despite efforts by government and private institutions (though assistance from these institutions is minimal) (Magingxa, 2006; Humphries, 2002; Nell, 1998).

The literature review has shown that the agricultural sector experienced profound changes in recent years. Further, policy reforms, which have both reduced the scale of support for agriculture and changed its focus, have impacted on farm incomes. At the same time, demand-side changes, in the form of increasing retailer concentration and complex patterns of consumer preferences, have required the development of sophisticated market-driven strategies. Farmers have demonstrated uneven abilities to adapt and adjust to these ongoing changes. The ability and propensity of farmers to engage in entrepreneurial behaviours is a key explanation of the different patterns of responses within the sector. Winter (1984) distinguishes two technological regimes of entrepreneurs: An 'entrepreneurial' regime facilitating innovative entry, whereas a routinised regime facilitates innovation by the incumbents in an industry.

The literature review further indicated and/or suggested that many small-scale farmers are constrained by various factors such as high loan interest rates, lack of and/or poor condition of roads leading to the farms, lack of management of harvesting programmes, inadequate technical assistance and inadequate infrastructure, insufficient contractual services (e.g. ploughing and harvesting), lack of institutional support, lack of knowledge with regard to the product quality needed by the marketing sector, poor market infrastructure and access to information, weather conditions that prohibit farmers from harvesting; carry-over of debts, lack of formal training (especially among those who acquired land through land reform), lack of sufficient production capital, lack of adoption of technology, stock theft, lack of extension service and veterinary support.

What is most important in this debate is the mainstreaming of farmers – which is the subject of the study. There are many factors that constrain the mainstreaming of farmers and also influence the success potential of small-scale farmers in Qwaqwa, and which prompted the researchers to collect data for the study in the area (Qwaqwa). Different mechanisms were used, including a questionnaire, one-to-one interviews and various other tools. Firstly a Cluster analysis was conducted with the aim of classing farmers based on their potential and ability to develop their farming businesses, and as a result, two clusters of farmers – more successful and less successful – were defined. More successful farmers were found to perform better in terms of making use of technical assistants (extension officers), leadership, financial record keeping, access to information, infrastructure and training. In addition to these findings it became clear that their skills in terms of financial record keeping help them to plan properly and assist them in decision-making.

Secondly, building on what was achieved by clustering also from the above results, a logit model was executed to determine factors that influence the farming success of the small-scale farmers. In this exercise, results of the cluster analysis were developed into the dependent variable. The objective was to assess the role of different variables that would logically influence the dependent variable. Variables such as technical assistance, transport costs, farm size, production loans, leadership skills, infrastructure and farmer's age were found to have featured significantly. In concluding these steps, Principal Component Analysis was deployed to investigate factors that influence the farming success of the small-scale farmers. Eventually the results grouped six principal components accounting for 88.72% of variability of the farming success. The influence of the derived components on the dependent variable was determined by again making use of a logit model. However, only five of the six components had a significant influence. The components were: physical access to markets, production capability, financial skills, optimal resource use and the experienced gained and scale of operations.

7.3 CONCLUSIONS

Based on the outcome of the study, the conclusions drawn from the results of the study are summarised and presented under two headings: 'General', and 'Principal components limiting success of farmers'.

7.3.1 General

Based on the outcome of the study, several issues have been found relating to the lack of success and the lack of mainstreaming of small-scale farmers in Qwaqwa. Some of the main problems, as mentioned previously, are the issues of production quality, infrastructure and the lack of adoption of new technologies by farmers, etc. It is believed that development and improved farmers' organisations, such as NAFU-SA, can assist in overcoming farmers' constraints. This implies that the farmers' organisation needs to strengthen its base through improved access and sharing of information and knowledge between members. There is a need for the farmers' organisation to inform its members about all developments and changes within the agricultural sector. For example, some farmers did not even know the price of one ton of maize on the South African Futures Exchange (SAFEX), although they are crop farmers. Some of the farmers pay an annual subscription fee to the Farmers' Union, but the majority of them cannot mention one important incident whereby they have benefited from the union.

Lack of coordination between farmers by their representatives with regard to access to information, farmers' days, farm management training, etc., has led to poor farming output and the poor performance by many farmers. There are no regular meetings held within the region that inform members about new developments in crop science, animal husbandry, adoption of technology, access to information, farm management practices, etc. Both the National African Farmers Union of South Africa (NAFU-SA) and the government must take the major step of ensuring that farmers are well informed about the sector at all times. They could also make use of local community radio stations and organise formal training and farmers' days.

There are mixed feelings with regard to extension officers or technical assistants. Even though few farmers confirm that they did have a visit from extension officers, they do not see their value. Farmers believe that extension officers only visit them if there is something that they could benefit from for themselves. Extension officers are shown to be one of the factors which are seen to be constraining the success of small-scale farmers.

Finally, from the study results it can be concluded that good planning, good management, proper training of both small-scale farmers and technical assistants, minimisation of transaction costs, good and dedicated labour (workforce) and proper infrastructure will have a significant and imperative role in development towards the improvement of production. This will then lead to small-scale farmers' successful farming. Also, there is a need for the development of agricultural research, as it will enhance small farmers' capacity to increase their production and productivity, as well as their competitiveness in the market. Ultimately, it would benefit communities and boost the economy in terms of employment and income for small-scale farmers.

The problems of the human immunodeficiency virus (HIV) and/or acquired immune deficiency syndrome (AIDS) were found to be constraining factors within the farming sector in Qwaqwa. Even though the problem was not thoroughly dealt with in the study it is indeed regarded as one of the constraining factors. Some of the farmers did mention it in passing; especially those who have casual labourers assisting them during harvesting or sheep shearing occasions. Finally, it has been proven that agriculture, specifically small-scale farming, can provide the necessary stimulus for economic growth in Qwaqwa, provided small-scale farmers are efficient, sustainable and competitive, and get the training necessary to improve their production.

7.3.2 Principal components limiting success of farmers

This study made an effort to determine the extent of the factors influencing the success of small-scale farmers in Qwaqwa by making use of both primary and

secondary factors. To fully understand and assess these factors a principal component analysis was performed due to multi-collinearity among the variables. This yielded six principal components, interpreted as production capability (PC₁), financial skills (PC₂), physical access to markets (PC₃), optimal resource use (PC₄), managerial skills (PC₅) and experienced gained and scale of operations (PC₆). These accounted for 88.72% of variability.

In addition to the principal component analysis, further regression analysis was performed and five significant components were found to be physical access to markets, production capability, financial skills, optimal resource use and experienced gained and scale of operations. The model has a 79% goodness of fit. Each of these five components that have a high level of significance influencing or limiting successful farming by small-scale farmers, their summary is contained below randomly:

Production capability consists of accessibility to information and technical assistance. This component was significant at a 5% level of significance. Even though majority of farmers state that they never had visits (47%) from technical assistants and do not need them because of their poor knowledge (33%), they still need them to assist them. It is not surprising when farmers say that their input is valueless based on the situation. But technical assistants (extension officers) are regarded as one of the most important components in the agricultural sector.

Financial skills consists with been able to keep good financial records that will assist in accessing credit from the credit providers such as banks, etc. and good educational background. This component was also found to be significant at 5% level of significance. This might be justified by the fact that all the financial institutions will loan anybody who's books are well balanced, show profit and accurate. Literature reveals that well infirmed farmers and those who are willing to learn are better adopters of new technologies as compared to their counterparts who are not willing.

Physical access to markets deals mainly with the cost of transport and the distance that small-scale farmers has to travel either selling or collecting whatever needed in the farm. Transport costs are one of the constraining factors in the farming business. They both have a positive relationship and this shows that if farmers are able to control them, they can save a lot on money. The greater the distance to the markets, the more the costs are to the farmers; also every increase in transport will always have a negative impact on the farming business. Joint venture when travelling to either markets (selling products or buying inputs) will reduce transport costs and increase level of communication among the farmers.

Optimal resource use consists mainly with utilising whatever resources that available within their means. Infrastructure is one of the constraining factors within the farming sector. For instance, it is known that most of the roads, especially those from the farms, are in bad conditions it will not be easy for farmers to sell their products or buy inputs. Farmers should also use their technical assistants to their advantage especially now government is equipping technical assistants with more knowledge and resources.

Experienced gained and scale of operations gives the farmers an upper hand in terms of having the ability to grab whatever chances that presents itself by making sure of their farming success. This component was found to be significant at 10% level of significance. Apart from farm size, gender sensitivity and farmers' age should not be ignored as they are also playing a very important role in their success.

These five components should not be ignored any further but be given attention with the aim of addressing the constraining factors. What small-scale farmers in Qwaqwa want to see is accessing markets and selling their products to the highest bidder. All these wishes can be achieved once all those involved in the agricultural sector join hands with the small-scale farmers.

7.4 RECOMMENDATIONS

Based on the outcome of the study, the following recommendations with regard to potential areas of improvement in sustainability and the success of the small-scale farmers, who play a vital role in their families and in the economy of Qwaqwa and the surrounding areas, are made:

7.4.1 Policy

- **Technical assistants:** The outcome of the study indicates there is a further need for the evaluation and the empowerment of the performance of technical assistants in the Free State province. It is recommended that the capacity of extension officers be enhanced so that they will be able to deliver quality assistance, as required, for the successful development of small-scale farmers. This implies that those who have received training in crop production should work with crop farmers, and those who have received training in livestock production should work with livestock farmers, etc.
- **Information Centre:** It is commonly known that small-scale farmers are struggling to penetrate the markets in order to sell their produce, but there is a general lack of market information. Therefore there is a need for the establishment of an information centre in the districts or regional offices, which could assist by providing valuable market information (pricing, quality of product needed, auctions, etc.) to small-scale farmers. The centre should also provide training to farmers (finance, book keeping, managerial skills, etc.) so that they can have access to the outside world. Further, community radio stations should also be used extensively to ensure that all farmers within the region have better access to information.
- **Technological Adoption:** The impact of the lack of technological adoption and veterinary innovations by small-scale farmers should also

be studied. This will help farmers to understand the impact that twenty-first-century technological advancement would have on their farming methods. Based on that the understanding and adoption of new technologies will at the end help small-scale farmers to produce better quality (as needed by the market) and increase their productivity. Even though this issue has been examined in previous studies, the recommendations have never been implemented, so it is important to revive these lost recommendations in order to assist in increasing the competitiveness of small-scale farmers with the agricultural sector.

- **Infrastructure Development:** Infrastructure plays a critical role within communities, especially for farmers; therefore there is a need to improve the infrastructure as it will increase easy access to markets for small-scale farmers and decrease the level of transport costs (especially for those who rely heavily on public transport to take their produce to markets). Significant increases in investment in rural infrastructure would help increase production and consumption, decrease malnutrition and increase livelihood security. Government should be engaged when the matter is dealt with, because they are responsible for infrastructural development, especially roads and railways.
- **Youth Development:** Due to the high level of illiteracy, which results in a lack of adoption of technology, access to marketing and production information, financial access, etc., there is a need for the youth to be recruited to play a major role within the agricultural sector. As already mentioned, the majority of the youth travel to urban areas once they complete their matric or tertiary education, and this has resulted in the loss of suitable candidates for agricultural development in the region. Youth can also play a major role in this regard. This can be done by recruiting them through financial assistance to further their studies (e.g. bursaries, scholarships, bursary/loans, etc). It should be kept in mind that it is also important for the youth to be involved in agricultural

activities, especially in any on-going processes attempting to meet their basic, personal and social needs. They need to feel cared for, valued and useful, and to build skills and competencies that allow them to function and contribute to their daily lives.

- **Union Development:** Improvement is needed within farmers' unions in the areas of communication, skills development and management. As part of development meetings should be held once a month; that will help in improving effective farming and sharing knowledge among union and non-union members. The National African Farmers Union of South Africa (NAFU-SA) should strengthen ties with other farmers' unions such as Agriculture South Africa (AGRI-SA), the Transvaal Agricultural Union (TAU), etc. in an effort to share the basic information, broaden small-scale farmers' knowledge base and equip their members with leadership skills. Apart from engaging in sensible dialogue with the rest of society, farmers need their representative organisations (structured from grassroots to the international level), as their legitimate voice. This is why a farmers' movement and other organisations are regarded as important because they are pillars of today's society.
- **Adult Education:** It is recommended that some form of basic training or adult education be provided, but the thrust should be on skills (either financial, managerial and or communication) development pertaining to the particular type of farming the small-scale farmer is engaged in. The effects of education and risk attitudes on technology adoption can be estimated by those who are schooled, meaning that schooling encourages farmers to adopt innovations. Thus, we find that schooling encourages innovation, a potentially risky undertaking, not only directly, but also indirectly through its effect upon attitudes toward risk and technological adoption. To the extent educated farmers are early innovators and are copied by those with less schooling (as other research on the same data has shown), the reduction of risk aversion

not only has private benefits for those with education but also may have externality benefits.

- **Access to Credit:** As already stated finance is the backbone of every business. And farmers in the Qwaqwa area are struggling to achieve what is best for their businesses because of finance and they are unable to secure loans with financiers. And no business can be successful in the industry without proper financial backing. After seeing the hardships faced by small-scale farmers when coming to financial issues, the South African government developed a policy called the Micro Agricultural Finance Institute of South Africa (MAFISA), that will contribute in assisting the small-scale farmers to run existing or starting new agricultural businesses and an able them into fully functional commercial farming businesses. Unfortunately this has never benefited small-scale farmers in Qwaqwa; therefore in the interests and benefit of small-scale farmers, government should revisit this MAFISA programme and make more funding accessible to all farmers, especially those in deep rural areas.
- **Infrastructure:** According to the results of the study, the majority of farmers are struggling because of poor infrastructure. Literature tells us that poor infrastructure, including poor rural roads, markets and transport systems result in high transaction costs for farmers and inaccessibility to both input and output markets are among the main problems that hinder the success of farmers. It is therefore of crucial importance that government upgrade and maintain roads in order to facilitate movement of agricultural products to markets. Also the establishment of agro-based industries to increase the value of agricultural produce; educational enhancement, capacitation and training of extension officers, establish local market centres to open up markets for farmers' produce; and extend rural electrification to facilitate agro-processing and build safe storages for small-scale farmers' produce.

- **Transportation Costs:** Transport plays an essential role in the economic development of the Qwaqwa region and it the heartbeat of every economy. Commodities produced in the rural areas have to be transported to urban areas where they will be processed and consumed. In general, well-coordinated transport in rural areas is an important connector between rural and urban areas and the nation at large. The results of the study have shown that most farmers are faced with high transport costs (which they do not know how to control), and they rely heavily on public transport. Therefore there is a need for farmers to be subsidised so that they can be able to transport their produce to markets.

7.4.2 For further research

In conclusion the following aspects are recommended for further research:

- There is a need to study the impact of leased farms on communal land, especially those given a lease period less than ten years.
- The benefits of having or joining a farmers' union and its (the union's) impact on production, market access and information accessibility for small-scale farmers should be examined. Also the union's contribution or role in financial access for small-scale farmers should be determined.
- It has been concluded in this study (based on the discussions with farmers) that extension officers were neither visible nor providing them with adequate advices as they expected, nor were they supplied valuable information and guidelines. However, when the researchers visited the offices of extension service managers many contradicting statements were discovered. It is therefore very important to research whether government extension officers do they still have a role to play

in assisting small-scale farmers or this portfolio should be privatised and adopt private extension services.

- Finally, there is also a critical need to determine the impact of the human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) within farming communities as it is believed that it impacts negatively on the labour force. The adverse effects of HIV and AIDS on agriculture and rural development are manifested primarily as the loss of labour supply, on- and off-farm income and assets. HIV/AIDS also is rumoured that it contributes to reduced productivity, yields and agricultural output.

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APPENDIX A:

QUESTIONNAIRE

UNIVERSITY OF THE FREE STATE
FACULTY OF NATURAL AND AGRICULTURE SCIENCES
DEPARTMENT OF AGRICULTURAL ECONOMICS

FARMER QUESTIONNAIRE ON CONSTRAINTS OF SMALL-SCALE FARMERS IN
QWAQWA, FREE STATE.

Date: DD - MM - YY

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Questionnaire no:

Mobile: **0731989572**
Office: **051-4013551**

Email: **koatlatab.sci@ufs.ac.za**

INSTRUCTION: Ask to speak to the farmer i.e. the person responsible for the day-to-day activities of the field plot(s).

GENERAL INFORMATION

a) Name of interviewee	
b) Location	
c) Name of the Village	
d) Postal Address and Telephone/Cell number	
e) Time taken for the interview	
f) Place interviewed	

A. DEMOGRAPHIC INFORMATION OF HOUSEHOLD
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A.1 Gender household head in years	Male	1
	Female	2
A.2 Age in years of household farmer		Years
A.3 Marital Status	Single 1 Married 2 Divorced 3 Windowed	4
A.4 Household size (number of people in the house)		
A.5 Level of education	None	1
	≤ Grade 5	2
	Grade 5-7	3
	Grade 8-10	4
	Grade 11-12	5
	Post-Matric	6
A.6 Occupation (apart from farming)	Teacher	1
	Doctor/Nurse	2
	Taxi Driver/Owner	3
	Security guard	4
	Other (specify).....	5

B. LAND AND AGRICULTURE

B.1 Type of farming (Name one)	Crops - Irrigation	1
	Crops - Dryland	2
	Livestock	3
<i>Specify:</i>	Mixed	4
	Fruit Irrigation	5

B.2. Soil type:	Sandy	1	Clayey	2	Loamy	3	Other	4
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B.3. How big is your farm size in hectares?	1 - 50	1
	51 - 100	2
	101 – 150	3
	151 – 200	4
	201 – 250	5
	> 250	

B.4 How did you acquire this land? (Can tick more than one)

Bought (Title deed)	1
Leased	2
Inherited	3
Given by government	4
Allocated by the headman	5
Renting and/or sharecropping	6
Other (<i>Specify</i>)	7

B.5 Please complete the table below.

Fields put under cultivation in 2006	Area (hectares to be indicated)	1
Field 1		2
Field 2		3
Field 3		4
Field 4		5
Field 5		6
Other		7

B.6. Are you satisfied with the size of the land that you have?	Yes	1
	No	2
B.7. Why?.....	Too Small	3
	Dry	4
	Shallow	5
	Other (specify).....	6

Livestock Enterprise

B.8 Number of animals on the farm

Animals		<i>Use: e.g. fattening, generating products, drought power</i>	
8.1 Cattle	Cows		1
	Calves		2

	Bulls		3
8.2 Goats	Goats		4
8.3 Pigs	Boar		5
	Sow		6
	Piglets		7
8.4 Sheep	Rams		8
	Ewes		9
	Lambs		10
8.5 Poultry	Hens		11
	Cock		12
8.6 Others (Specify):			13

C. HUMAN CAPITAL ENDOWMENTS

Knowledge – farming experience

C.1. How long have you been farming?		years
C.2 How long have you been farming on your current farm?		years
C.3 How long have you been farming with the current enterprises?		years
	Crops – Dryland	years
	- Irrigated	years
	Livestock	years

Farmer Qualities

Qualities	Question	Always	Sometime s	Never
C.5 Leadership	Do you take risks in trying new farming techniques?	1	2	3
C.6 Motivation to progress	Do you help other farmers in farming?	1	2	3
C.7 Need for autonomy	Do you consult other farmers before making a decision?	1	2	3

Planning skills

C.8 To what extent do you actively plan your actions for the future?	Always	1
	Sometimes	2
	Never	3
C.9. Resource utilization – Farm Enterprise Diversification		
C.10. Are you involved in any other farm activities, apart from growing crops and keeping animals? (e.g. value addition).	1	Yes
	2	No

C.11. Specify (if “Yes”).....	Packaging	1
	Branding	2
	Nutritional Input	3
	Other (specify).....	4

C.12. Do you find such farm activities profitable?	1	Yes
	2	No

C.13. What are the resources that you need and that you consider useful in improving your enterprise? (Fill the blank space below where appropriate. Marked space = 1; Open space = 0)

<i>Technique specification</i>	<i>C.13.1.1 Livestock enterprise</i>	<i>C.13.1.2 Crops enterprise</i>	<i>C.13.1.3 Fruits (Citrus)</i>
Technical Inputs			
<i>Technique specification</i>	<i>C.13.2.1 Livestock enterprise</i>	<i>C.13.2.2 Crops enterprise</i>	<i>C.13.2.3 Fruits (Citrus)</i>
Technical information			
<i>Technique specification</i>	<i>C.13.3.1 Livestock enterprise</i>	<i>C.13.3.2 Crops enterprise</i>	<i>C.13.3.3 Fruits (Citrus)</i>
Technical equipment			
<i>Technique specification</i>	<i>C.13.4.1 Livestock enterprise</i>	<i>C.13.4.2 Crops enterprise</i>	<i>C.13.4.3 Fruits (Citrus)</i>
Technical Infrastructure			

D. INFRASTRUCTURE AND CAPITAL

Available equipment

D.1. Please indicate any 5 most important types of equipment that you use for both farm production and marketing.

Type of asset	Condition (e.g. poor, good etc.)	Quantity	Age (years)	Estimated value (R)

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Financial Management

D.2.1 Do you keep any financial records?	Yes	1
	No	2

D.2.2 If 'Yes' to D.2.1, fill in the following table for the types of records you keep.

	Thorough neat	Rough incomplete	Only ideas	None	Office use
Cost records	4	3	2	1	
Income records	4	3	2	1	
Animal production records	4	3	2	1	
Crop production records	4	3	2	1	
Labour records	4	3	2	1	
Inventory records	4	3	2	1	
Other (specify) 1.	4	3	2	1	
2.	4	3	2	1	
3.	4	3	2	1	
4.	4	3	2	1	

D.3 Do you think keeping farming records is important?	Yes	1
	No	2

D.3.1 If 'Yes' in D.3, how important is the records to you?

	Not Important	Important	Very Important	Office use
Determining financial position	1	2	3	
Decision-making and planning	1	2	3	
To keep the bank or co-op manager happy	1	2	3	
Other (specify).....	1	2	3	

Question	Yes	No
D.4 Do you need credit for your farm enterprise?	1	2

D.5 Did you access any production loans in 2006/7?		1	2
D.6 Have you ever been denied a production loan?		1	2
D.7 To which source of credit do you have access?	Commercial banks	1	
	Agricultural cooperatives	2	
	Other (Specify).....	3	
D.8 If 'Yes' on 'D.6' what were the reasons?	Lack of invoices of what has been sold	1	
	Non residency of the community	2	
	Lack of a performing account	3	
	Lack of collateral or security (physical assets -farm machinery and livestock)	4	
	Other (Specify)	5	

Marketing Management			
D.9 Do you (sometimes) produce surplus?	Yes	1	
	No	2	
D.10 Do you store (part of) your produce	Yes	1	
	No	2	
D.11 Why do you store produce?	To sell later at higher price	1	
	For seed	2	
	Lack of access to market	3	
	For future consumption	4	
	Other (specify)	5	

Crop Production

Fertilizer usage

Please fill the table below?

D.12 Do you use fertilizers when growing crops?	Yes	1	No	2
Options	Inorganic		Organic	Both
D.13 Types of fertilizer in use	1		2	3
D.14 Type of preferred fertilizer	1		2	3
D.15 Reason for the preferred fertilizer type	Good	1		
	Cheap	2		
	Other	3		
D.16 Do you get these/this fertilizer(s) readily available?	Yes to 1 only	1		
	Yes to 2 only	2		
	Yes to 3	3		
	No to 1 only	4		
	No to 2 only	5		
	No to 3	6		

D.17 If 'No to 3' in D 16, what are the reason(s)	Lack of finance	1
	Delivery problems (e.g. poor transport network)	2
	Not available on the market	3
	Other (specify).....	4

Labour Usage				
Question	Yes	No	Number of labourers	Days per year
D.18 Do you employ permanent labour on your farm?	1	2		
D.19 Do you employ seasonal or casual labour?	1	2		
D.20 Are you satisfied with the number of labour that you employ?	1	2		

D.21 Where do you obtain labour?

Family labour	1	Hired labour	2	Help from neighbours	3	Others:	4
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D.22 Are you satisfied with the quality of labour that you employ?	1	Yes
	2	No

D.23 Why?		
	Good	3
	Lazy/ Come late	4
	Other (specify).....	5

Information and Training

D.24 How do you obtain information about your output prices?

Radio	Television	Newspapers	Internet	Extension	Friends	<i>Other (specify)</i>:
1	2	3	4	5	6	7

D.25 Are you a member of the National Farmers Union (NAFU)?	1	Yes
	2	No

D.26 If 'Yes' on D.25, are you satisfied with NAFU in terms of technical information provision?	1	Yes
	2	No

D.27. Do you attend workshops to learn about farming practices?	1	Yes
	2	No

Knowledge

D.28 Have you ever experienced the problems of soil erosion?	1	Yes
	2	No

D.29 What measure would you/have you put in place to prevent loss of soils? (Wait for response then tick the appropriate)

Measure	Examples	
Mechanical measures	Use of share ploughs and implements to create a coarse or cloddy soil surface;	1
Organic measures	Cover crops, crop residues or other organic matter on the surface;	2
Stubble cultivation	Leaving stubble on the surface;	3
Strip cultivation	Leaving the previous season's crop standing, or cutting off high when harvesting and planting between the old rows.	4
Other (Specify)		5
None		6

Skills

Disc the borders of the farm	1
Conducting regular fire drills	2
Minimizing hazards on site (e.g. extreme care when handling gasoline)	3
Keeping things clean and in good repair (e.g. Test your fire or smoke alarm system at least once a year.)	4
None (nothing)	5
Other (specify)	6

Fire Prevention and Safety on the Farm

D.30 How do you prevent fire from destroying your farm? (Can tick more than one)

Farm equipment

Ploughing equipment

D.31 Amongst the following which ploughing equipment do you use to till the land?

Tractor	1
Animal drawn	2
Hoes	3
Other	4

Cattle inputs

D.32 Do you own or have access to a milking parlour?	Yes	1
	No	2
D.33 What do you use for milking of the cow?	Human labour	1
	Milking machine	2
D.34 What would you prefer to use in milking the cow?	Human labour	1
	Milking machine	2
E. RESOURCES		

Land-use

E.1 What crops/fruits have you produced in the past 12 months?	Crops/fruits	Area	Units	Quantity	Income

1.1 Wheat					
1.2 Maize					
1.3 Apples					
1.4 Bananas					
1.5 Pumpkins					
1.6 Other (specify).....					

E.2. What livestock sales (including poultry) have you made in the past 12 months?

Indicate animal	Quantity	Price	Total revenue
2.1 Cattle			
2.2 Goats			
2.3 Sheep			
2.4 Pigs			
2.5 Chickens			
2.6 Other (specify)			
TOTAL			

E.3 Please indicate the category of your family income.

Category	Sources of Income (specify)	Rands	
A		0 – R1000	1
B		1001 – 2000	2
C		2001 – 3000	3
D		3001 – 4000	4
E		5001 – 6000	5
F		6000>	6

Technical assistance

E.4 Which of the following sources provides you with farming advice (basic support structures)?

Government agricultural extension work	1
Private extension workers (extension officer of FNB)	2
Development agencies	3
Friend (Other farmers)	4
Other (<i>Specify</i>)	5

E.5 Have you ever received any assistance from technical assistants?	Yes	1
	No	2

E.6 How often did technical assistants visit your farm in 2006/7?	Once a week	1
	Once a fortnight	2
	Once a month	3
	Twice a month	4
	Never	5
	Other (<i>Specify</i>)	6

E.7 How do you view the quality of the technical assistants who visit you?

Excellent	1
Very good	2
Satisfactory	3
Poor	4
Very poor	5

Other (never had a visit from extension officer)	6
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F. MARKET ACCESS

F.1 Did you produce a surplus for one or more of your crops in 2006/7?	Yes	1
	No	2

F.2 How often did you produce a surplus in the past 5 years?	Always	1
	Sometimes	2
	Never (if no on F1)	3

F.3 If you produced a surplus, for what purpose did you use it in 2006? (Can tick more than one)

Purpose	Tick	
Give it to a neighbour	1	
Sell it at the farm	2	
Sell it by the road side	3	
Sell it to a local shop	4	
Sell it to a nearest town	5	
Sell to a supermarket in town	6	
Take it for household consumption	7	
Give it to my animals	8	
Other: specify	9	

F. 4 How far is it to get to your main market outlet? State in km	0 – 40	1
	41 – 80	2
	81 – 120	3
	121 – 160	4
	161 – 200	5
	200 >	6

F.6 Were you guaranteed of a market for your produce in 2006/7?	Yes	1
	No	2

F.7 Did you have a contract for marketing your output in 2006/7?	Yes	1
	No	2

F.8 If “yes” above, what kind of assistance if any do you get from those you have a contract with?.....		
	Retail	1
	Packaging	2
	Other (specify).....	3

F.9 If you did not have a contract in 2006/7, have you ever tried to get one?	Yes	1
	No	2

F.10 If “yes” above, what was the reason for not getting a contract?		
	Poor Quality	1
	Other (specify)	2

F.11 Did you have any problem(s) with getting your produce sold in 2006/7?	Yes	1
	No	2

F.12 If “NO” on F6 states the problem(s)? (Fill the table below)

1) Poor quality	1
2) Less produce	2
3) No Market	3
4)	4
5) Other (specify)	5

F.13 Is there any produce that you could not sell in 2006/7?	Yes	1
	No	2

F. 14 Name the product and the reason? (If yes on F8)

Product	Reason
1)	
2)	
3)	
4)	
5)	

THANK YOU!!!

KEYA LEBOHA!!!

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