FACTORS DISTINGUISHING LOW TURNOVER EMERGING FARMERS
FROM HIGH TURNOVER EMERGING FARMERS
IN SOUTH AFRICA.

By

SENYOLO, GRANY MMATSATSI

BSc Agric, University of Limpopo (UL)

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Department of Agricultural Economics
School of Agriculture and Environmental Sciences
Faculty of Health, Sciences and Agriculture
University of Limpopo
Limpopo Province
South Africa

Supervisor: Mrs. P. Chaminuka (UL)
Co-supervisors: Dr M.N. Makhura (Land Bank)
: Prof. A. Belete (UL)

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DECLARATION

I declare that the dissertation hereby submitted to the University of Limpopo for the degree of Master of Science in Agricultural Economics has not previously been submitted by me for the degree at this or any other university, that is my own work in design and in execution, and all material contained therein has been duly acknowledged.

Signed--

Date --

DEDICATION

To my late father (Khashane Alpheuse Senyolo),
my mother (Daphney Ngwana-Mohuba Ramoshaba), my younger brother
(Cedrick Makwala Senyolo) as well as all the emerging
farmers in South Africa

ABSTRACT

The main objective of this study is to identify the socio-economic factors associated with the level of annual farm turnover of emerging farmers in South Africa. This study defines emerging farmers as those farmers that are participating in the market and have intentions to produce and sell more. The study is based on a randomly selected quota sample of 500 emerging farmers surveyed from the nine provinces of SA in 2005. Descriptive statistics, factor analysis and logistic regression are used to analyse the data. Factor analysis is used to determine the emerging farmers' access and utilization of agricultural infrastructure and support services. The logistic regression is used to predict the likely positioning of emerging farmers in the high and low farm turnover groups. Farm turnover is based on how a farm household organizes and manages its resources and how it is able to interact with the outside stakeholders. The level of annual farm turnover is categorized into four groups, low turnover group 1 (LTG1), low turnover group 2(LTG2), high turnover group 1 (HTG1) and high turnover group 2(HTG2).

Whilst many studies on constraints to production in agriculture in South Africa have identified infrastructure as such a constraint, few have attempted to study the extent to which emerging farmers are able to access and utilize output markets infrastructure. The results show that the local output markets are generally more accessible to emerging farmers. Access to external markets is absent. The implication of this is that it is important for policymakers to know that farmers access output markets in a package form and that the role of locating output markets in centers can stimulate agricultural and rural development.

The creation of favourable environments for the participation of emerging farmers in the mainstream of the economy has been the most significant initiative in promoting structural change, away from subsistence farming towards commercialization of agriculture in South Africa. Despite the new opportunities that have been created to facilitate participation of emerging farmers in the first economy, emerging farmers continue to face a host of challenges ranging from socio-economic to farm based

constraints. These constraints have made some emerging farmers to fall in the high farm turnover group and others in the low farm turnover group.

Logistic regression analysis is used to identify socio-economic factors that place emerging farmers in one group versus the other and to identify constraints faced by emerging farmers. Six logistics models are developed to distinguish emerging farmers in one group from another. Model 1 compares the HTG2 and the LTG1. The factors that increase the likelihood of being in an HTG2 rather than in an LTG1 are farm size, level of education, sugar farming, tarred road to the local fresh produce market, distance to the output market, being NAFU (National African Farmers Union) membership, and access to ground water. Horticulture and livestock farming decrease the chances of being in the HTG2. Factors that increases the likelihood of being in the HTG2 rather that LTG2 are farm size, level of education, sugar farming, road conditions to the local fresh produce market and access to ground water. Farm structure decreases the chances of being in the HTG2.

The main factors affecting most of the emerging farmers in South Africa are the size of farm, level of education, distance to output market which leads to lack of transport and that most of the emerging farmers uses surface water for irrigation. Some of the farmers face poor road condition to the output market and they produce less to the output market. Access to high value commodities such as sugar does increase.

The policy required to encourage commercialization must be tailored to the needs of the different categories of emerging farmers in South Africa. The low turnover group of farmers appears to contain community garden farmers. These farmers will require the comprehensive set of programmes that are commonly recommended. The programmes include land reform, educational programmes, infrastructural services, marketing and credit facilities, crop insurance, as well as transportation.

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Acronyms

ARC : Agricultural Research Council

BATAT : Broadenings Access to Agricultural Thrust

CASP : Comprehensive Agricultural Support Programme

DAEC : Department of Agriculture and Environmental Conservation

DBSA : Development Bank of Southern Africa

DPLG : Department of Provincial and Local Government

FAO : Food and Agricultural Organization

FSP : Farmer support programme

GDP : Gross Domestic Product

IFAD : International Fund for Agricultural Development

IITA : International Institute of Tropical Agriculture

LRAD : Land Redistribution for Agricultural Development

MALA : Ministry of Agriculture and Local Affairs

NAMC : National Agricultural Marketing Council

NDA : National Department of Agriculture

NERPO : National Emerging Red meat Producers Organization

PDA : Provincial Department of Agriculture

StatSA : Statistics South Africa

CHAPTER 1:   INTRODUCTION

1.1   Background

South Africa is currently undergoing a significant transformation in its political, social and economic structure. The political dimension of the transformation process has been remarkably and successfully completed as marked by the first all-race election in April 1994 and the subsequent elections in 1999 and 2004. The government has made considerable progress in peeling away the legacy of racial segregation through legal and regulatory reform and redistributive public investment programmes (Ngqangweni, 2000). This process of change has called attention to the issue of reintegration of the previously marginalized black rural inhabitants into the mainstream economy.

An important component of South African agricultural policy is to increase incomes of the poorest groups in society through opportunities for small/medium-scale farmers. The National Department of Agriculture (2001) gives particular attention to small-scale agriculture with three strategic aims (a) making the sector more efficient and internationally competitive, (b) supporting production and stimulating an increase in the number of new small-scale and medium-scale farmers and (c) conserving agricultural natural resources.

A major challenge facing South Africa is the development of rural areas, many of which are seriously disadvantaged. Another challenge is the development of policies and

strategies that will help previously disadvantaged farmers (emerging farmers) benefit from the more liberalized, deregulated market for agricultural products.

Emerging farmers of South Africa emanate from the group of smallholder farmers, who were previously excluded from the mainstream of the economy. They now constitute a major part of what is referred to as the second economy in agriculture. They include beneficiaries of land reform programmes and new entrants who took advantage of opportunities to enter into agriculture. While these smallholder farmers provide livelihoods to some 20 million people, they still face very difficult conditions, for example, poor infrastructure. According to Stats SA census (2001), 65-90 percent of rural households (depending on location) lack access to decent roads, while 2.4 million households have no access to nearby telephone trunk lines or cell phone connections. Only 58% have access to piped water and only 51% have access to electricity (Stats SA, 2001).

Emerging farmers are further frustrated by an inability to gain access to infrastructure. A survey conducted by the NERPO (National Emerging Red Meat Producers Organization) among its members has shown that farmers are unable to gain access to finance because institutions such as the Land Bank require land held in title as collateral. According to NERPO, access to land and farm infrastructure remain the main constraints to the commercialization of emerging farmers (Blom, 2006).

Commercialization or transformation of emerging farmers has been researched for years. The basic concept centered on linking farmers with money generating activities. The motivation for commercialization is to generate income in order to acquire other goods. This is even more applicable in South Africa where basic and municipal services are being provided on a cost recovery basis (Makhura *et al*, 1996).

This study defines commercialization in terms of farm turnover, which is the reflection of how farming links the farmer with the monetary economy. Farm turnover indicates the gross farm income which is the sales from enterprise output.

1.2   Definition of emerging farmers

The National Department of Agriculture (NDA) defines emerging farmers as farmers who are the beneficiaries of one of government's land reform programmes {e.g. Land Redistribution for Agricultural Development (LRAD) and Comprehensive Agricultural Support Programme (CASP)}, and again as farmers who are mainly dependent on state and semi-state organizations for support and finance and again those farmers who consume and sell some portion of their harvest (NDA, 2006). Gelderblom (2003) defines emerging farmer as a person who aspires to farm successfully within his or her given physical, mental and socio-economic constraints and needs the assistance of an external facilitator to realise this aspiration. This study defines emerging farmers as those farmers that are participating in the market and have intentions to produce and sell more.

The study applies the concept of level of income (or farm turnover) to explain participation of emerging farmers in the mainstream of the economy. At micro level, farm turnover is based on how a farm household organizes and manages its resources and how it is able to interact with the outside stakeholders. At macro level, the farm income positions the role of agriculture and farmers in the economy. In South Africa, the development of the local economies (operated at municipal level) has been eminent (DPLG, 2003). The municipalities have been introducing a range of programmes and policies to stimulate the local economies. Farmers, on the other hand, have been contributing to the economic development of the local economies.

1.3   Role of emerging farmers in South Africa

Agriculture remains the backbone of the South African economy. Not only does it contribute to the gross domestic product (GDP), but it is an important earner of foreign exchange, provides employment, has some of the strongest forward and backward linkages in the economy, as well as strong employment multipliers and it provides food (MALA, 1998). Its contribution to GDP over the last decade ranged between 3 and 5%, but this does not reflect the true contribution in terms of the other issues mentioned. It employs 11% of the labour force with many dependents (NDA, 2003). According to DBSA (2000), agriculture is a cornerstone of South African rural economies. Emerging farmers are responsible for an ever-increasing percentage of agricultural exports.

Smallholder agriculture creates a demand for non-farm sector goods. Linkages with non-farming sectors become stronger when farming generates more income. The expansion of

rural incomes through agricultural production creates a market for inputs and consumer goods and services. As a result, productivity of resources can be transferred from the agricultural sector to the rest of the economy without constraining required growth in the agricultural sector (Makhura, 2001).

The instability of agriculture or the failure of the agricultural sector affects its considerable effect on backward linkages and consequently those industries relying heavily on agriculture as a market become relatively unstable. Emerging farmers can contribute positively to rural development, increase in rural income and the overall economy. According to Van Rooyen (1997), agriculture has the potential to contribute significantly to economic development and transformation through stimulation of income and employment within the countries. The increase in levels of non-farm activities in the economy provides job opportunities for the rural poor (Kirsten *et al*, 1998). The emergence of small-scale farms is supported because of intensive utilization of labour and capital thus fulfilling employment and equity goals (Ellis, 1988), which large farms do not meet. According to Delgado (1999), the small-scale emerging farm sector in South Africa is important in terms of providing employment, human welfare and political stability.

In other countries, particularly from Africa, studies show that small-scale agriculture has been the primary motor of development in rural areas that have achieved higher returns from land and capital over time than large scale agricultural productions (Delgado, 1997). It has been shown by Ngqaweni (2000) that small to medium scale farmers are at least as

privately and socially efficient as their large scale counterparts. Based on the above assertion it can be argued that the smallholder agriculture in certain commodities would at least not waste resources, save country foreign exchange and could promote local economic activity.

1.4   Challenges faced by emerging farmers in South Africa

According to Sasol (2006), one of the biggest challenges faced by emerging farmers in setting up sustainable and competitive farms is the application of old cultural farming knowledge in an industry that has become technologically advanced. For example," The mentorship programme was designed to provide emerging farmers with the support and practical experience to navigate the modern dairy industry landscape and ensure sustainable and long-term productivity."(Sasol, 2006)

Molewa (2002) pointed out the challenges to be overcome by the small scale and emerging farmers en route to their entering the commercial farmers market:

➢ Practicing designed breeding programmes.

➢ Adaptation of livestock to environment.

➢ Creating mechanisms that make controlled grazing possible.

➢ Ability to prevent and fight livestock diseases.

➢ Improving profitability of small scale farmers.

➢ Creating access to open markets.

➢ Value adding opportunities.

➢ Development of business management skills.

The issue of lack of access to start-up finance for small and emerging farmers remains a major challenge. According to Masango (2006) emerging farmers who have land, still lack equipment, such as tractors, to plough their land.

According to the survey that was done by the Land Bank (2001), emerging farmers lack access to marketing channels and the type and quantity of produce demanded by these markets, but are also hampered by the transport costs of delivering products to the markets. The relatively small quantities often produced by emerging farmers also increase the transaction costs related to marketing.

Financial institutions tend to be physically inaccessible to emerging farmers, but complicated loan application procedures and collateral requirements also limit access to finance. The long loan processing time and late payment of loans (after the planting season) are also perceived as problematic with financial institutions like the Land Bank. On the issue of land, insecure land tenure means that emerging farmers cannot use land as a means of collateral while it also limits the possibility of expanding farming activities in many directions. In summary, the slow pace of land redistribution is one of the perceived reasons why access to land remains a problem.

Lack of infrastructure, including electricity, dams, roads, etc, poses a constraint to many emerging farmers as this problem increases the transaction costs of many farming activities. Infrastructure is also not always well maintained on communal land. High input cost versus low prices is a problem that commercial and emerging farmers share.

The decline in the value of the Rand has resulted in price increases on inputs e.g. seed, fertilizers, etc, while prices of agricultural commodities remain low due to: surplus production in the subsidized markets of Europe and USA, negative climatic conditions, lower demand due to a slowdown in the world economy and increased competition from the other emerging markets like South Africa.

Emerging farmers do not have the necessary skills and training to cope with the complex agricultural situation of today. Many are illiterate and have little access to information on the technical and other aspects of agricultural production. Again South African climatic conditions on the whole are not conducive to profitable agricultural activities and farmers face, for example, drought, floods and pests and diseases on a regular basis. Theft of crops and livestock is also a factor that limits production potential.

1.5   Government policies and emerging farmers in South Africa

After 1994, South African agricultural policy expanded its focus from the fully developed, modern, commercial farming sector to include the emerging farming group found in traditional tribal areas. Government institutions like the Department of Agriculture, the Land Bank and the Agricultural Research Council hastened to revamp, cater to the needs of this most needy group. A second big change in agricultural policy came in September 1997, when the New Agricultural Products Marketing Act swapped a controlled marketing economy for a free market situation (Germishuis, 1998). South African agriculture is highly dualistic with a small number of commercial operations run

predominantly by white farmers and large numbers of subsistence farms run by black farmers.

Most agricultural development institutions are still learning how to deal with the special circumstances and needs of emerging farmers. The result is that the National Department of Agriculture has all but lost direct control over the instruments and institutions with which it could possibly influence agriculture (DBSA, 2005).

Access to land is essential if the poor are to enjoy the benefits of agricultural growth, and creating such access is expected to improve the production capacities of the marginalized. However, land ownership in South Africa is highly skewed due to past policies. To correct this imbalance, the government launched its land reforms in 1994, comprising tenure reform, restitution and redistribution programmes. Tenure reform aims to address insecure tenure; restitution involves giving back land or providing equivalent compensation to those who were dispossessed of their land through apartheid laws after 1913, while redistribution aims to redress racial imbalances in land ownership (DBSA, 2005).

Improving market access for disadvantaged communities involves a range of aspects, from ensuring that they produce products of the right quality acceptable to the market, to physical functions such as providing them with infrastructure and information. Thus, improving market access requires a range of interventions by the state. These include the provision of marketing infrastructure (depots, auction pens, telecommunications

infrastructure, etc.); information (on prices, markets, buyers, grades, etc.); extension (technical production issues, quality requirements, financial and market knowledge) and research (on a wide range of issues).

According to Machethe (2004) one of the major constraints on the growth of smallholder agriculture in African countries is high transaction costs, largely attributable to poor infrastructure. Inadequate physical infrastructure in rural areas, particularly in the former homelands, remains a major obstacle to such growth in South Africa. Despite government initiatives to improve the quality and quantity of infrastructure in the rural areas through programmes such as the Community Based Public Works Programme, the Consolidated Municipal Infrastructure Programme, and the Poverty Relief and Infrastructure Investment Fund, the impact on the lives of many rural people has been limited (Everatt & Zulu, 2001). Large investments were made in smallholder irrigation schemes in the former homelands, but many of these schemes are not performing optimally because of the withdrawal of state support (Machethe et al, 2004).

Smallholder agricultural growth cannot be achieved without access to farmer support services. In the 1990s, the National Department of Agriculture initiated the Broadening Access to Agriculture Thrust (BATAT) programme to provide such services, but it never got further than the planning stage. The Department's second attempt was the new CASP (National Department of Agriculture, 2004). However, the approach needs to be broadened to include smallholder agriculture in the former homelands. Until that happens, these services will not be available to most smallholder farmers.

According to the DBSA (2005), it would be hard to argue that government policies and programmes to support smallholder agriculture in South Africa are sufficient when the current state of policies is either inimical to these farmers' interests or ignores them altogether. If agriculture is to make more of a contribution to poverty alleviation, the incomes of smallholder farmers will have to be raised, which requires promoting the growth of smallholder agriculture.

1.6   Problem statement

South Africa has a dualistic agricultural economy, comprising a well-developed commercial sector and a predominantly subsistence-orientated small scale sector. Agriculture is divided into approximately 50 000 commercial farmers and an unknown number of emerging or 'developing' farmers (Louw *et al,* 2004). Many development efforts on emerging farmers have not been successful due to several reasons. For example, marketing arrangements were not encouraging commercial output.

A range of constraints and barriers limits smallholder participation in the agricultural market. As a result most of the smallholder products are wasted after harvesting or sold at a very low price. Farmers generally do not have the required information and means to locate better markets. Many a time reliable markets are located further away and are difficult to access. Only farmers with assets such as vehicles are able to move around in search of a better market (Makhura, 2001).

Agricultural service institutions deliver a variety of goods and services to emerging farmers. They deliver inputs such as seeds and fertilizers, financial services such as loans, product marketing services, technologies developed from research, information such as extension support and training. Most of them are organizations with a mandate to perform particular functions. Most constraints to smallholder agricultural development tend to fall within the mandate of agricultural service institutions (Mabedza-Chimedza, 2000).

It is the main objective of the policy makers to transform small scale farmers into commercial entrepreneurs (DAEC, 1986; and BATAT, 1995) by assisting them to increase their agricultural production. However, there have not been adequate studies of the type of farmers that are more likely to market part of their production (Makhura, 1994). The fundamental question is what are the social and economic characteristics that differentiate farmers with high levels of farm turnover from those with low levels of farm turnover? Identifying these factors will assist in the formulation of more appropriate development policies to accelerate the process of transforming emerging farmers into commercial farmers.

1.7   Justification of the study

Primary research on emerging farmers is particularly pertinent since not enough is known about them, as the sector is in fast transition. Unfortunately, there are not so many nationally based surveys on emerging farmers that have been turned into public knowledge. Most of the surveys are case studies focusing on community level or selected enterprises or targeted problem areas. The last comprehensive survey to claim national

public knowledge on smallholder farmers was done in the early 1990's based on the DBSA sponsored Farmer Support Programme (FSP) (Makhura *et al*, 2006).

Due to the political landscape then, the FSP survey dealt with farmers in selected former homelands areas. However, the survey was imperative in determining the farmer's response to comprehensive support intervention (Singini and van Rooyen, 1993). The findings of the research were pertinent in influencing a development paradigm for smallholder farmers.

Some selected findings of the surveys were used to determine the effect of transaction costs of market participation by smallholder development issues, there was still a need to capture broader development challenges of what could now be referred to as emerging farmers, who are beyond the smallholder concept.

1.8   Objectives of the study

The objectives of this study are as follows:

a. To determine the socio-economic factors distinguishing low turnover emerging farmers from high turnover emerging farmers in South Africa.

b. To determine the patterns of access and use of output infrastructure and support services by emerging farmers.

c. To determine the constraints faced by emerging farmers in South Africa.

d. To recommend strategies for improving market access of emerging farmers.

These objectives may offer information for policy alternatives that could promote and enhance better commercial orientation, and thus lead to improved rural household incomes. Policy options for commercial orientation can be integrated in the broader framework of integrated sustainable agricultural and rural development strategy.

1.9   Hypotheses of the study

a. Socio-economic factors such as age, gender, education and employment status distinguish high turnover emerging farmers from low turnover emerging farmers.

b. Emerging farmers access different types of infrastructure in a package form or systematic or sequential.

c. Poor infrastructure and lack of support services are constraints causing failure among emerging farmers.

1.10   Organization of the thesis

The study is presented in six chapters. Chapter 2 presents the factors affecting the level of farm turnover. Chapter 3 contains a discussion of the methods of analysis employed in the study. Chapter 4 presents the characteristics of the emerging farmers in South Africa while Chapter 5 presents factors distinguishing the emerging farmers. Finally, Chapter 6 summarizes the study and discusses the major conclusions. The more important policy implications are also discussed in this chapter.

CHAPTER 2: FACTORS AFFECTING THE LEVEL OF FARM TURNOVER

2.1 Introduction

The level of farm turnover is impacted by internal and external factors. According to Langemeier and Weeden (2006), internal factors includes farm size, age of the farmer, technology adoption, land tenure, non-farm income and financial structure, while external factors are input and output prices changes, changes in crop insurance as well as government program provisions.

2.2 Factors affecting the level of farm turnover of emerging farmers in South Africa

In South Africa, most of emerging farmers are found in the former homelands areas. According to Stats SA (2001) these areas still have poor infrastructure and continue to experience major service backlogs (DBSA, 2005). Smallholder farmers are also found in the new land reform resettlement areas. These constitute about 3% of the agricultural land. Most of the farms under resettlement have not been productive. There is a general lack of support services for new owners. The beneficiaries do not have sufficient capital to finance post-settlement operations. They also do not have sufficient knowledge about the new farming activities.

One of the most significant initiatives in SA to cater for the needs of small scale farmers in general, was the establishment of the FSP (Farmer Support Programme) in 1987. The

main aim of the programme was the promotion of structural change, away from subsistence agricultural production towards commercialization of agriculture, by the provision of comprehensive support services to emerging farmers in the so called "self governing" and "independent homelands" in SA (DBSA, 1988). The major concern of the present government has always been to expand the existing FSP so that many existing and emerging small scale farmers could benefit from the multi-facet services of the programme.

The dynamics of emerging farmers and the rural communities are more complex than that of the white commercial farmers. The intention is to change the historical process to become one of participatory development and exchange of technologies, resulting in the empowerment of all involved (Hart and Isaacs, 2005). Based on the discussion with emerging farmers in the Western and Northern Cape Province, Isaacs (1996) identified the following factors as constraining the participation of the emerging farmers in mainstream agriculture:

Discrimination because of race and gender; a lack of access to land for farming; lack of provision of and access to water; lack of access to markets; illiteracy and related problems; minimal access to financial assistance; minimal access to cooperatives and marketing organizations, especially membership in such bodies; lack of access to appropriate information, technology and extension services and; lack of access to agricultural education and institutions. According to Isaacs (1996), these constraints also continue to affect research and extension agenda.

The results of the survey made by Lotz *et al* (2000) indicate that a distinction can be made between equity schemes, where there is support from a commercial farm or company, and emerging farming on own land. The latter group often farms without adequate resources, support and guidance. They need greater support than equity scheme enterprises- especially in terms of access to resources and experienced management.

According to the study by Lotz *et al*, 2000, emerging farmers identified the need for training on all technical aspects of their farming, as well as the development of financial, farm management and marketing skills as immediate priorities. Again, they require bridging capital to start and sustain their venture for a number of seasons until the enterprises realize a sustainable income and profit. Land reform grants usually only cover the cost of the purchase of the land and not the other necessary inputs and infrastructure.

However, many of the emerging farmers do not have a source of income for production purpose and to support their families and are consequently unable to commit themselves to full-time involvement in the venture. Although various organizations assist emerging farmers, efforts are often uncoordinated and not as effective as required (Lotz *et al*, 2000). Large investments were made in smallholder irrigation schemes in the former homelands but many of these are not performing optimally because of the withdrawal of state support (Machete *et al*, 2004).

Improving agricultural production largely requires improving rainfed agriculture an important source of food for an increasing population in such areas (FAO, 1990 and Parr

et al., 1990). As a result there is need for more efficient use of water and land in both rainfed and irrigated agriculture to meet future food demand and growing competition for productive resources (Fox and Rockstrom, 2003). Sustained growth in agricultural productivity is seen as being critical to improvements in food security (Ortmann and Machethe, 2003 and Weibe, 2001) for rural populations, as it translates into increased food supplies and lower prices for consumers. Secondly, growth in agricultural productivity will lead to higher incomes, thus an improved ability to purchase food and other basic necessities, for many food-insecure households who earn their livelihoods through agricultural production.

2.3   Factors affecting the market access of emerging farmers

According to Heinemann (2002), rural people in Africa, especially the poor, often say that one reason they cannot improve their living standards is that they face difficulties of accessing markets where they can obtain agricultural inputs and consumer goods and sell the produce that they grow. A major reason why even those farmers who can produce a surplus remain trapped in the poverty cycle is lack of access to profitable markets. All too often farmers are forced to sell to the buyer of convenience at whatever price that buyer dictates (IITA, 2001).

Access to markets is critical in allowing new farmers into the mainstream because it is considered as one of the most important determinants for their success (NDA, 2000). From this perspective, the integration process of the emerging farmers should not be viewed in a narrow context of only allocating land and water, but in a broader perspective

that embeds the access to these resources in an overall economic framework that includes access to markets, credit, extension, etc. These aspects of viability should be viewed in line with other important factors such as the managerial abilities of the farmers. This requires applied research and monitoring so as to generate information on the conditions for achieving sustainable livelihood strategies for the smallholder farmers for eventually integrating them in the national economic system.

In addition, most of the literature related to smallholder agricultural marketing, e.g. Dorward *et al* (1998), Freeman and Silim (2001), IFAD (2003), Jayne et al (2002), Kherallah and Kirsten (2002) and Killick *et al* (2000), reiterates that the problem of market access is linked to the following constraints: price risk and uncertainty, difficulties of contract enforcement, insufficient numbers of middlemen, cost of putting small dispersed quantities of produce together, inability to meet standards. Other problems relate to physical market access like physical infrastructure − roads, market facilities, power and electricity. In rural areas, for example, smallholders are often geographically dispersed, roads and communications are poor and the volumes of business are insufficient to encourage private sector service provision. Rural people are also the most difficult group for potential buyers to reach. To overcome these problems, farming communities have formed cooperatives, collective marketing associations, and other mutual alliances to increase their buying and selling power in the market place. Larger commercial players have also been active, forming mutually beneficial alliances with farmers supplying marketable products at agreed prices. Clearly, it is only by such means that most developing country farmers can move from a poverty cycle to an income

cycle, and begin to make a real contribution to overall economic development (IITA, 2001).

2.4   Infrastructure and agricultural development

One of the major constraints to the growth of smallholder agriculture in African countries is high transaction costs (Machethe, 2004), largely attributable to poor infrastructure. This situation is no exception in South Africa, particularly the former homelands (DBSA, 2005). A large proportion of rural households continue to lack access to basic services (Stillwell and Makhura, 2004). Government initiatives to improve the quality and quantity of infrastructure in the rural areas through programmes such as the Community Based Public Works Programme, the Consolidated Municipal Infrastructure Programme, and the Poverty Relief and Infrastructure Investment Fund, have registered limited impact on the lives of many rural people (Everatt and Zulu, 2004).

Improved infrastructure reduces the cost of transactions for participants in the economy (Makhura, Kirsten & Delgado, 2004) and can improve overall development outcomes and economic competitiveness (DBSA, 2006). Infrastructure is the capital stock that provides public goods and services. Wanmali (1992) categorizes infrastructure services to agriculture into soft and hard infrastructure.   The 'soft infrastructure' includes transportation services, finance services, animal husbandry, input distribution and marketing. This can improve or hinder agricultural development. Roads, telecommunications, electrification and irrigation are termed 'hard infrastructure'. Infrastructure in all its forms is viewed as a 'means to an end' (DBSA, 2006) and efforts

to improve the competitiveness of emerging farmers should take cognizance of, amongst other things, critical issues on infrastructural factors that have a direct bearing on levels of turnover for emerging farmers in South Africa. Most studies on infrastructure and rural development have focused on industrialized countries due to the absence of data in developing countries (Yoshino and Nakahigashi, 2000).

Numerous studies (Wanmali, 1987, DBSA 1998, Yoshino and Nakahigashi, 2000, Makhura and Wasike, 2003 and others) have shown that good infrastructure services are necessary for agriculture and rural development. Under normal circumstances all infrastructure is located in the settlement system of a region, and the accessibility of these services will determine the economic activity in that region. The relationship between infrastructure development and agricultural development is bi-directional. Infrastructure development can stimulate agriculture and rural development, whilst on the other hand agricultural development can also stimulate improved infrastructural development. Improved infrastructure also has the potential to reduce inequality in income distribution.

Access to road transportation determines households' demand for production and consumption goods and services (Wanmali, 1992). If agricultural inputs and output markets are more accessible rural households will tend to use these services more, leading to improved productivity (Kamara, 2004). Deficiencies in rural infrastructure services result in poorly functioning domestic markets with little spatial and temporal integration, low price transmission, and weak international competitiveness (Pinstrup-Anderson and Shimokawa, 2006). Economic activities in most rural areas tend to be

concentrated around areas where there are banks, postal services, retail outlets and suppliers of inputs.

Poor road conditions, high transport costs and distant markets have been identified as factors that hamper improved market access for emerging farmers in South Africa (Makhura and Mokoena, 2003, Nieuwoudt and Groenewald, 2003), and also contribute towards failing input markets. Factors that determine access to input and output markets include distance to the markets, the state of the roads, the cost of transportation and the frequency of visits to these markets. Rural service centres, nearby towns and cities are often an important source of inputs for farmers, and also provide a market for farm produce. According to Mabogunje (1980), the analysis of the relationship between centre and periphery, particularly the relationship between infrastructure and people, is viewed as a centrepiece in regional development planning in the developing world.

Infrastructure directly affects human welfare and equity across community and income groups. Urban and rural households in South Africa experience widely different access to basic infrastructure services. The lowest household income groups have no or extremely limited access to infrastructure (Bogetic and Fedderke, 2005). Pinstrup-Anderson and Shimokawa (2006) illustrated the causal relationships between physical infrastructure and various facets of agriculture. Figure 1 shows that physical infrastructure such as irrigation and transport and road systems, together with institutions such as banks and markets make possible a range of production options which are translated to higher agriculture productivity through technology adoption.
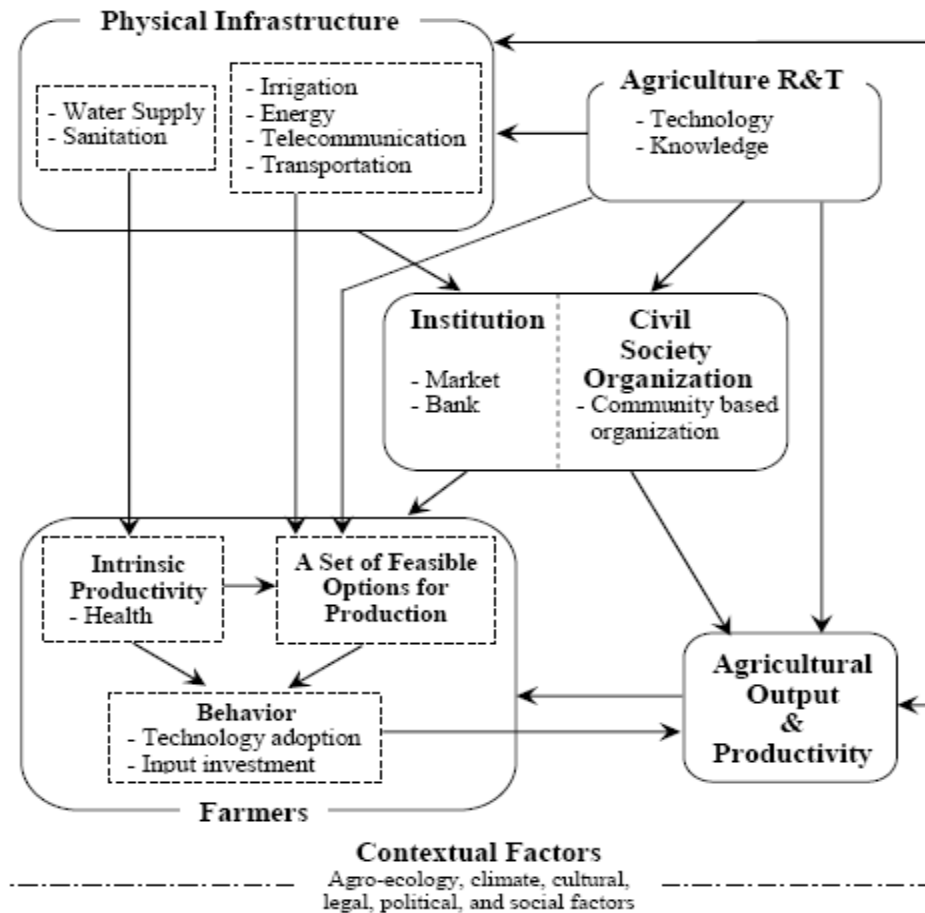
Figure 2.1: How infrastructure promotes agricultural development

Source: Pinstrup-Anderson and Shimokawa (2006)

http.siteresources.worldbank.org/INTDECABCTOK2006

2.5   Summary

In this chapter, it has been demonstrated that there are a lot of factors that affect the level of farm turnover or the progress of emerging farmers in South Africa, such as

(i)   Lack of access to land for farming

(ii)   Lack of access to markets

(iii)   Illiteracy

(iv)   Lack of financial assistance

(v)   Lack of access to appropriate information

(vi)   Poor infrastructure, etc

Most emerging farmers are faced with lack of access to market information and, most importantly, a proper understanding of the fundamental factors that influence behavior of the market. Market information has been identified as one of the critical constraints facing emerging farmers to participate successfully in the commercial markets (Morokolo et al, 2005, Montshwe et al, 2005 and Louw et al, 2005). Lack of access to market information can result in a reduction of market access opportunities. According to Nicholson (1992) and Rauniyer (1990) inadequacy of market information affects the probability of market participation. This affects their level of farm turnover.

CHAPTER 3:   RESEARCH METHODOLOGY

3.1   Introduction

This chapter describes the research methodology used to collect data and to analyze variables that were considered to distinguish the low turnover group of emerging farmers from the high turnover group in South Africa. The chapter provides a brief description of the sources of information used, the determination of the farmers' population, sampling technique, and data collection method. The way the survey data were analyzed is also presented in this chapter.

3.2   Method used in data collection

The main method used in the collection of the data was household interviews. A structured questionnaire was developed based on the knowledge of farmers and their farming operations in their areas. The information was collected through a structured questionnaire administered on individual head of households. The developed questionnaire comprises of several parts, amongst others, geographic, demographic, infrastructure, support services, marketing and ownership of assets, and water management and climate change. The information and data were collected by the Development Bank of Southern Africa (DBSA) and the Marketing Survey and Statistical Analysis (MSSA) in 2005 for another project.

3.3   Sampling

A sample of 500 emerging farmers was randomly selected after an initial process of identifying emerging farmers in each province by the DBSA and MSSA for their project. The number of households interviewed in each province is listed in Table 3.1.

Table 3.1: List of Provinces and Number of Respondents

	Frequency	Percent
Eastern Cape	70	14.0
Free State	40	8.0
Gauteng	50	10.0
KwaZulu/Natal	70	14.0
Limpopo	70	14.0
Mpumalanga	50	10.0
Northern Cape	40	8.0
North West	50	10.0
Western Cape	60	12.0
Total	500	100.0

Source: Makhura *et a*l (2006)

3.4   Methods used in data analysis

The Statistical Package for Social Sciences (SPSS) for Windows was used to analyze data. Descriptive statistics including means, frequencies, and standard deviations were calculated.

A set of analytical techniques was used with an emphasis on multivariate procedures such as factor analysis (FA). The main reason for use of factor analysis was that the study was faced with a big data set which needed to be reduced to a small number of variables. After using the factor analysis to group and thereby reduce the number of variables, the

logistic regression was then applied. This provided the analytical information on the factors that distinguish low turnover emerging farmers from high turn over emerging farmers in South Africa.

3.4.1   Factor analysis (FA)

Factor analysis seeks to resolve a large set of measured variables in terms of relatively few new categories, known as factors. These are linear combinations of the data. The coordinates of each observation or variable are measured to obtain the factor loadings which represent the degree of correlation between the particular variable and the factor. According to Johnson & Wichern (1992) and Hair *et al* (1995) the purpose of FA is to describe the covariance relationships among many variables in terms of a few underlying, but unobservable, random quantities called factors interpreted through weights of the variable called factor loadings organized in a matrix of factor loadings. The FA model is organized in such a way that all variables within a particular group are highly correlated among themselves but have relatively small correlations with variables in another group (Makhura *et al*, 1997).

The factor analysis model can be expressed in matrix form as:

$$\mathbf{x} = {}^{\wedge}\mathbf{f} + \mathbf{e}$$

Where **x** is the vector of *n* observable variables

      f is the vector of *m* unobservable factors ,

      ^ is called the loading matrix of the order *nfm*

      e is the error vector of *nx1*.

So, the importance of FA is that it retains most of the information contained in the original data while reducing the number of variables in the data set. FA is superior to principal components in that the results can be used for further analysis. Secondly, unlike principal component that uses a loading method leading to inflation of factor loadings, FA offers alternative loading methods. In economics FA has been applied in technology adoption (Rauniyar, 1990), dairy management (Ford & Showiller, 1994), stages of economic development (Yotopoulous and Nugget, 1990), and food buying practices (Herrmann and Warland, 1990) and sources of risk (Bullock et al, 1994). FA is considered appropriate for understanding the underlying dimension of the emerging farmer's data. Factors from factor analysis will be used in the logistic regression.

Table 3.2: Variables included in the factor analysis

Variables	Units
Output market infrastructure	
Distance to the family and friends	km
Tarred road condition to the family and friends	%
Produce sold by emerging farmers to the family and friends	%
Distance to the public market	
Tarred road condition to the public market	
Produce sold by emerging farmers to the public market	
Distance to the local fresh produce market	
Tarred road condition to the local fresh produce market	
Produce sold by emerging farmers to the local fresh produce market	
Support services	
1 if a farmer faces shortage of land, 0 otherwise	Dummy
1 if a farmer lacks financial support, 0 otherwise	Dummy
1 if a farmer is aware of projects or support services aimed at emerging farmer	%
1 if a farmer is aware of agricultural projects, 0 otherwise	Dummy
1 if a farmer forms part of the projects or support services aimed at them	%
1 if a farmer forms part of agricultural project, 0 otherwise	Dummy
1 if a farmer receives financial support	%
1 if a farmer needs agricultural inputs from the municipality, 0 otherwise	Dummy
1 if a farmer requires infrastructure from the municipality, 0 otherwise	Dummy
1 if a farmer is a NAFU member, 0 otherwise	Dummy
1 if a farmer was not aware of NAFU, 0 otherwise	Dummy

3.4.2 Logistic Regression model

The primary objective of this is to determine the relationship between socioeconomic characteristics of the emerging farmers and their level of annual turnover. This will be done by estimating logistic models to identify characteristics that differentiate one turnover group from the other (Shields, 1991; Gujarrati, 1995; Aldrich and Nelson,

1984). The responses will be used as the basis of the dependent variable in a logistic regression model:

The logit model is based on the probability that Y equals one ($P=P_1$). The value of Y is assumed to depend on the value of X_k, $k=1,\dots k$. That is $P=P_{1/x}$, where X represents the set of k independent variables. The logit models representing the relationship of Y and X is given by

1. $P_{1/x} = \exp (\sum \beta_k X_k)/ [1+ \exp (\sum \beta_k X_k)]$

    Where B_k are k parameters.

This model can be transformed to a linear equation by taking a log. The linear transformation will be given by,

2. $\log [p_i / (1-p_i)]=\sum \beta_i X_i k$

The observed logits, using sample proportions as an estimate of Pi can be defined as:

3. $L_i = \log (\hat{p}_i / (1- \hat{p}_i)$

Now true logits can be estimated by the observed logits

4. $L_i = \log [\hat{p}_i / (1- \hat{p}_i)]+ E_i$

    OR

5. $L_i = \sum \beta_k X_{ik} + E_i$

Annual farm turnover is the dependent variable which is measured in Rand (R) as a value of sales from all farming activities. Annual farm turnover is categorized into four

categories which are very low turnover group (LTG1), low turnover group (LTG2), high turnover group (HTG1), and very high turnover group (HTG2).

Emerging farmers were classified according to the above categories. This classification is adopted from the classification made by DBSA for high turnover and low turnover emerging farmers in South Africa

Table 3.3: Annual farm turnover in Rand and corresponding groupings

Annual Turnover in Rand	Group	Frequency	Percent
Less than 10000	LTG1	205	41
10000 to 49999	LTG2	169	33.8
50000 to 100000	HTG1	48	9.6
Greater than 100000	HTG2	73	14.6
Total		495	99

Use of ordinary multiple regression techniques or discriminant analysis is not suitable for such type of study, and the alternative is to use the logistic regression model. Thus the analytical technique used for this study is logistic regression. In logistic regression the dependent variable is binary and can only take two values. Logistic regression allows one to estimate the probability that given a set of factors a farmer falls into the low turnover or the high turnover group.

A logit model is also generally preferred to the probit model due to its simpler mathematical structure. The logit model is based on the cumulative distribution function and yields results that are not sensitive to the distribution of sample attributes when estimated by maximum likelihood. If the aim is to examine which variables are

significant in explaining a dependent variable using the logit model, disproportionate sampling is not a problem as it only affects the constant term and not the estimated slope coefficients (Maddala, 1992).

The traditional approach to statistical model building involves seeking the most parsimonious model that can reasonably explain the data. In general, the appropriateness of the decision to begin the multivariable model with all possible variables depends on the overall sample size and the number in each outcome group relative to the total number of candidate variables. When the data are adequate to support such an analysis it may be useful to begin the multivariable modeling from this point (Hosmer and Lemeshow, 2000).

The operational logit model can be written as;

$$\mathrm{logit}(p) = \ln\left(\frac{p}{1-p}\right) = \alpha + \beta_1 x_{1,i} + \cdots + \beta_k x_{k,i}$$

The ratio p/1-p is the odds ratio. It shows the likelihood of a farmer being in the high turnover group in relation to his being in the low turnover group.

In the model:

P_i = probability that a farmer belongs to the high turnover group

$1\text{-}P_i$ = Probability that a farmer does not belong to the high turnover group

X_i = various socio-economic factors considered in the study

B_i = Parameters to be estimated

U_i = Disturbance term

The socio-economic variables that are considered in the study include household demographic characteristics such as the level of education of the farmer, the farm characteristics and enterprises such as farm size, farm structure and type of enterprises, infrastructure such as output market, input market and services infrastructure. Support services, water use and climate change as well as marketing variables are also included in the model. The problem of multi-collinearity is corrected by including only one of a set of variables that were found to be correlated.

The dependent variable (Y) takes on the value of 1 if an emerging farmer is in the high farm turnover classification and 0 if the emerging farmer is in the low farm turnover classification. The definition of the independent variables expected to be directly related with high turnover are presented in Table 3.3. Other variables will be taken from the factor analysis.

Table 3.4: Definition of variables included in the logistic model

Variables	Description	Unit
Dependent variables:		
HTG2	1 if emerging farmer makes a turnover of more than R100 000, 0 otherwise	Dummy
HTG1	1 if emerging farmer makes a turnover of between R50 000 and R100 000, 0 otherwise	Dummy
LTG2	1 if emerging farmer makes a turnover of between R10 000 and R49 999, 0 otherwise	Dummy
LTG1	1 if emerging farmer make a turnover of less than R10 000, 0 otherwise	Dummy
Independent variables:		
Demographic characteristics		
EDUC	1 if the farmer has grade 8 or more, 0 otherwise	Dummy
Farm characteristics and enterprises		
FARSIZ	Area used for farming	ha
FAROWN	1 if the farmer is the owner, 0 otherwise	Dummy
SUGA	1 if the farmer is producing sugar; 0 otherwise	Dummy
HORT	1 if the farmer is in horticulture farming; 0 otherwise	Dummy
LIVSTO	1 if the farmers is livestock farming; 0 otherwise	Dummy
Water use and drought effect		
GROWAT	1 if farmer uses ground water' 0 otherwise	Dummy
EFDROU	1 if farmers affected by drought, 0 otherwise	Dummy
Marketing		
CUSCOL	1 if customers collect output from the farmer, 0 otherwise	Dummy
SESEL	1 if farmer sell by his own, 0 otherwise	Dummy

3.5   Summary

The econometric framework discussed in this section will make it possible to determine the patterns of access and use of output infrastructure and support services by emerging farmers and to analyze the factors that distinguish low turnover emerging farmers from

high turnover emerging farmers in South Africa. The four hypotheses postulated in chapter 1 will be tested with the results of the analyses presented in the next chapters.

CHAPTER 4: CHARACTERISTICS OF THE EMERGING FARMERS IN SOUTH AFRICA

4.1 Introduction

This chapter aims to provide some insight into the characteristics of the emerging farmers in South Africa. The information given below is derived from the descriptive analysis of the data collected as described in Chapter 3. In this chapter, demographic characteristics, farm characteristics and enterprise, infrastructural access, support services access, water sources as well as marketing channels are discussed.

Results were in tabular form and charts and each of them is interpreted. The total sample size was 500 emerging farmers. Due to unreliable data five observations were dropped, and as such the results presented in this chapter are based on 495 emerging farmers. However, the questionnaire was structured in a manner that allowed respondents to choose or provide more than one answer per question. Therefore, in most cases one would find percentage frequencies that are more than 100, where more than one answer per question was chose and/or provided. The information in this chapter of the dissertation is based on preliminary descriptive analysis of the report (Makhura *et al*. 2006) done with the DBSA.

4.2   Demographic characteristics

Several studies have found a direct correlation between the number of years a farmer is educated and performance in farming (Bizimana et al, 2004, Mohammed & Ortmann, 2005, etc). Education is a fundamental factor that can enable the farmer to easily communicate, understand business operations and be able to interpret market information. Highly educated farmers are likely to be in the high turnover group. Table 4.1 shows the level of education of the emerging farmers (respondent) by turnover. The results show that of emerging farmers in the LTG1, almost 25% have no formal schooling. Emerging farmers in the higher turnover have higher proportion of grade 12. This is encouraging as it makes training very much easier. The results show that an increase in tertiary diplomas among emerging farmers makes annual turnover go up.

Table 4.1: Educational level of the respondents by turnover

Level of education	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
No schooling	24.9	11.2	4.2	4.1	15.2
Primary schooling	22.0	23.1	6.3	9.6	19.0
Standard 5/ Grade7	9.3	7.1	6.3	6.8	7.9
Standard 6/ Grade 8	11.2	8.9	16.7	11.0	10.9
Standard 7/ Grade 9	7.3	3.6	4.2	2.7	5.1
Standard 8/ Grade 10	6.8	12.4	8.3	15.1	10.1
Standard 9/ Grade11	4.4	4.7	14.6	6.8	5.9
Standard 10/ Grade 12	9.8	17.8	29.2	26.0	16.8
Tertiary diploma	3.9	7.1	10.4	15.1	7.3
Degree	0.5	4.1		2.7	2.0
Total	100	100	100	100	100

4.3   Farm characteristics and enterprise

Farm size plays an important role in farming. The size of a farm is based on the size of land used by the household. High turnover is achieved by large farm size. Table 4.2 shows the average farm size that is occupied by the emerging farmers. The results show that emerging farmers in the LTG1 occupy on average a small size of land (29ha) as compared to the emerging farmers in the HTG2 who occupy an average of 266 ha of land.

Table 4.2: Average farm size (ha) by turnover

Farm size	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Mean	29.1	67.2	50.0	266.3	79.1
Std deviation	91.195	183.354	87.545	534.366	252.112
Min	0.3	0.3	1.0	2.0	0.3
Max	912	1600	400	3200	3200

The different types of legal entities prevalent amongst emerging farmers are classified in the study as individual (farm on my own), farming as part of a cooperative, as a closed corporation or in partnership. Figure 4.1 show the legal form of land or the structure of land by turnover. The results show that most of the emerging farmers (74%) farm on their own. This perhaps indicates that those emerging farmers who decide to farm as individuals are in the low turnover. On the other hand those farmers who are in partnerships or as closed corporations are likely to have higher farm turnover.
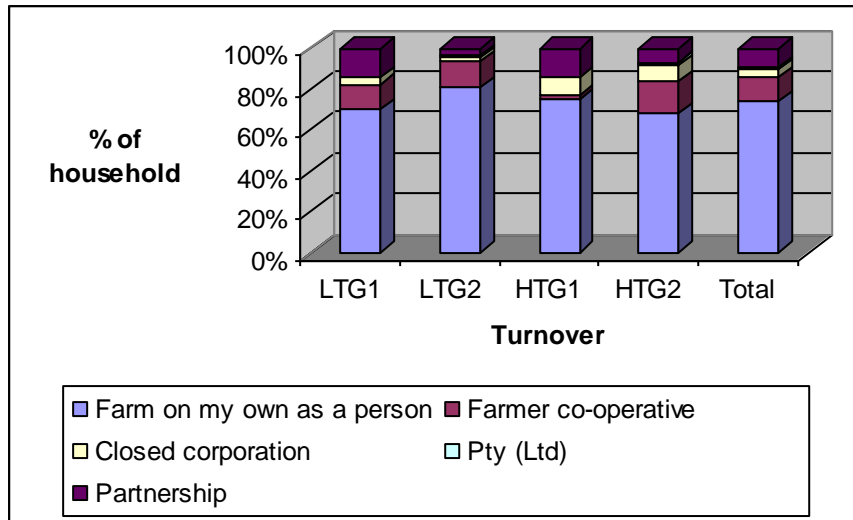
Figure 4.1: Legal form or structure of the farm by turnover

Agriculture is the main economic activity in most rural areas, and the ability and willingness of a household to adopt technology impacts on their total household production as well as the household's participation in output markets. On the other hand the amount of income that a household generates from agricultural activities may also influence the household's decision to adopt certain technologies or not. All the households that participated in the survey were involved in agricultural activities, albeit at different levels.

Emerging farmers in South Africa are involved in different types of enterprises. The types of enterprises they are involved in tend to define the pattern of income of the farmers. Table 4.3 shows the farm enterprises by turnover. The results show that beef is the main enterprise for the middle turnover groups. Most of the emerging farmers in the LTG1 are mainly involved in vegetable and small stock farming. Emerging farmers whose farm enterprise is sugar are in the high turnover group.

Table 4.3: Farming enterprise by turnover

Farming enterprise	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Stock farming (beef)	23.9	33.7	41.7	23.3	28.9
Stock farming (mutton, goat, wool)	18.0	9.5	2.1	5.5	11.7
Summer & Winter crops	4.4	5.9	10.4	8.2	6.1
Dairy		1.8	8.3	4.1	2.0
Vegetables	33.7	16.0	10.4	4.1	21.0
Fruit	1.5	5.9		8.2	3.8
Other	1.0	4.7	2.1	5.5	3.0
Pigs	4.4	7.1	4.2	1.4	4.8
Poultry	7.8	8.9	12.5	8.2	8.7
Sugar	1.5	1.8	4.2	30.1	6.1
Cotton	3.9	4.7	4.2	1.4	3.8
Total	100	100	100	100	100

4.4 Access and use of output infrastructure

Access and use of output markets is fundamental to the commercialization process of emerging farmers. The output markets are the places where transactions are made and emerging farmers use a variety of marketing channels for their produce. Distance to the market affects the cost of transport which also impacts on farmer profits. Lack of markets or long distances to the market can be a disincentive to farmers who want to commercialize.

Previous studies outlined that farmers do not market their products cooperatively but market individually. There are no formal or informal contracts between producers and buyers. Most emerging farmers produce without the knowledge of who would be the

buyer. Transactions are for cash only and usually take place at the farm; i.e. farmers are not involved in the transportation of products to the buyers. Buyers of products are mainly family and friends, public market/ road side market and the local fresh produce market. The ability to access such market centres can distinguish low farm turnover from high farm turnover. In this study, emerging farmers were asked to indicate their distance in km from the different market destinations. They were further asked to indicate the road conditions and the produce they sell to the different destinations.

The distance is used to indicate the accessibility of output market. Table 4.4 shows the accessibility of market destination by turnover. The results show that the metro fresh produce markets are the further, particularly for the high turnover group. The family and friend market is the closest output market for emerging farmers in all turnover groups.

Table 4.4: Average distance (km) to the output market by turnover

Distance to output market		LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Distance to family and friends	Mean	4.1	9.7	6.3	10.5	6.7
	Std deviation	6.276	11.672	7.363	12.012	9.363
Distance to public market	Mean	7.5	14.4	11	35.7	13.45
	Std deviation	10.259	21.953	13.241	45.643	22.043
Distance to local fresh produce market	Mean	9	27.7	13.1	28.3	19.4
	Std deviation	13.064	67.048	15.615	38.637	44.201

Table 4.5 shows the proportion of products sold to the output market by the emerging farmers. The results show that most of the emerging farmers in the low turnover groups sell most of the produce via the output market. This perhaps means that emerging farmers in the high turnover groups tend to sell most of the products to other output market like hospitals, schools, hotels, coops, abattoir, factories, etc. These are specialized market that absorbs most of the farmer's output. The results show that farmers diversify their products among various markets. This implies that the markets are still less reliable.

Table 4.5: Percentage of produce to the output market by turnover

Percentage of produce to the output market		LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
% Of produce to family and friends	Mean	68.2	47.9	45.3	33.9	56.5
	Std deviation	34.832	34.024	32.561	32.495	35.987
% Of produce to public market	Mean	57.1	52.4	39.3	48.3	51.9
	Std deviation	29.933	29.431	25.859	46.837	30.988
% Of produce to local fresh produce market	Mean	66.0	54.3	44.4	54.4	56.7
	Std deviation	27.064	26.671	25.671	37.513	29.412

Table 4.6 shows the road conditions from the household to the output market. The results show that most of the emerging farmers in the low turnover groups use gravel roads to the family and friends market as compared to other turnover groups. Eighty five percent of emerging farmers in the HTG1 use the gravel road to reach the public markets. There is a reasonable number of emerging farmers in the HTG2 who use the tarred road to reach the local fresh produce market.

Table 4.6: Road condition to the output market by turnover

Road condition to the output market	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Tarred road to family and friends	32.7	22.3	20.7	25	27.4
Tarred road to public market	42.9	28.3	7.7	22.2	30.1
Tarred road to local fresh produce market	32.1	46.2	60	69.2	47.4
Gravel road to family and friends	53.1	66	69	55	59.2
Gravel road to public market	41.3	63	84.7	55.5	68.9
Gravel road to local fresh produce market	49.1	34.7	28	15.4	35.1

4.5   Support services

Emerging farmers' agricultural growth cannot be achieved without access to support services. Access to support services can significantly increase agricultural productivity. Experience from other countries indicates that a comprehensive approach to the provision of support services is required to achieve growth in the smallholder agricultural sector.

This section aims to determine the relationship between the support services and the turnover groups. Support services include projects and support aimed at emerging farmers, financial support and factors hampering emerging farmers to develop into commercial farmers, agriculture and municipal services.

The awareness by emerging farmers of projects or supports service aimed at them can increase agricultural productivity. Figure 4.2 shows the proportion of emerging farmers that are aware of projects or support services aimed at them. The results shows that more than 50% of the emerging farmers in all the turnover groups surveyed are not aware of the projects or support services aimed at emerging farmers. Some studies outlined that

most of the emerging farmers are located in the remote areas, hence it is not easy for them to access information. About 50% of the emerging farmers in the HTG2 are aware of projects or support services aimed at them.
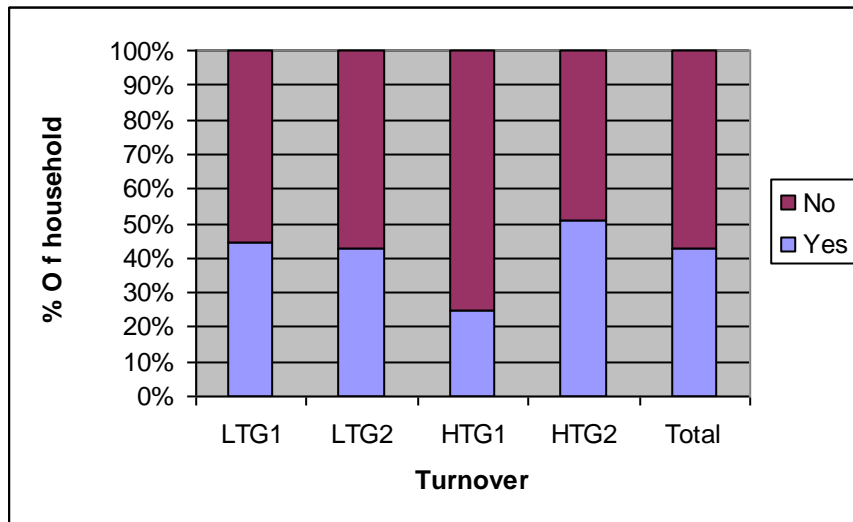
Figure 4.2: Awareness of projects or support services aimed at emerging farmers by turnover

Projects or support services that are aimed at emerging farmers were categorized into 4 groups which are financial support, extension services, agricultural projects and others. Most of the emerging farmers in all the turnover groups were aware of agricultural projects (poultry projects, goat projects, vegetable projects, etc). Twenty seven percent of emerging farmers in the LTG1 were aware of financial support services aimed at them.

Table 4.7: Projects or support services of which emerging farmers are aware by turnover

Projects or support services	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Financial support	26.7	20.0	25.0	24.2	23.9
Extension support	17.4	15.7	8.3	18.2	16.4
Agricultural projects	53.5	62.9	66.7	57.6	58.2
Others	2.3	1.4			1.5
Total	100	100	100	100	100

Figure 4.3 shows the proportion of emerging farmers forming part of the projects or support services aimed at them. Out of the emerging farmers that were aware of the projects, most of them in all the turnover groups did not form part of the projects or support services aimed at them. This is true as many of the emerging farmers were not aware of the projects or support services aimed at them.
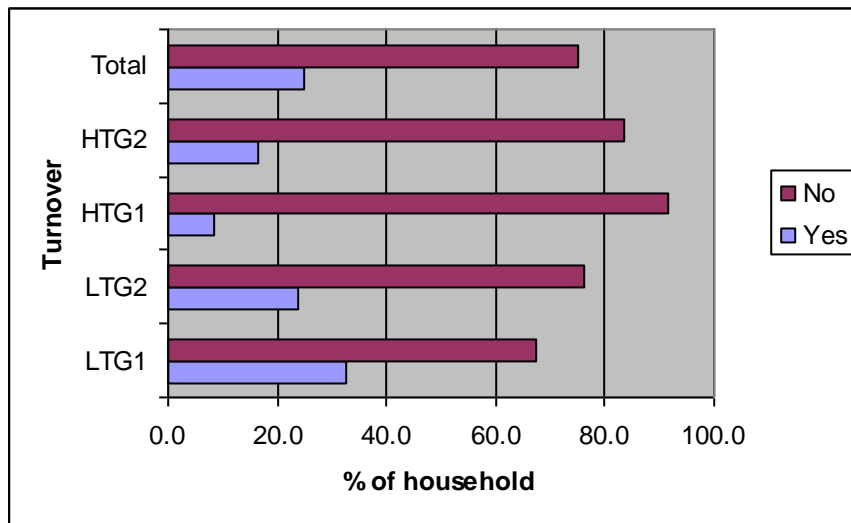
**Figure 4.3: Participation in projects or support services aimed at emerging farmers by turnover**

Projects or support services that emerging farmers were participating in, were recoded into 4 groups which are financial support, extension services, agricultural support and others. Table 4.8 shows the projects or support services in which the emerging farmers participate. The results show that most of the emerging farmers in the entire turnover groups form part of the agricultural projects. About 17% of emerging farmers in the HTG2 form part of the extension services.

Table 4.8: Projects or support services of which emerging farmers form part by turnover

Projects or support services	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Financial support	4.5	15.0			7.4
Extension services	13.6	15.0		16.7	13.9
Agricultural projects	78.8	62.5	100.0	66.7	73.0
Other	3.0	7.5		16.7	5.7
Total	100	100	100	100	100

Most of the emerging farmers do not have access to financial assistance. This may be because of the lack of collateral needed by the financial institutions. Sixteen percent of the emerging farmers received financial support services for their farming operation. Most of the emerging farmers in all the turnover groups do not have access to financial support.
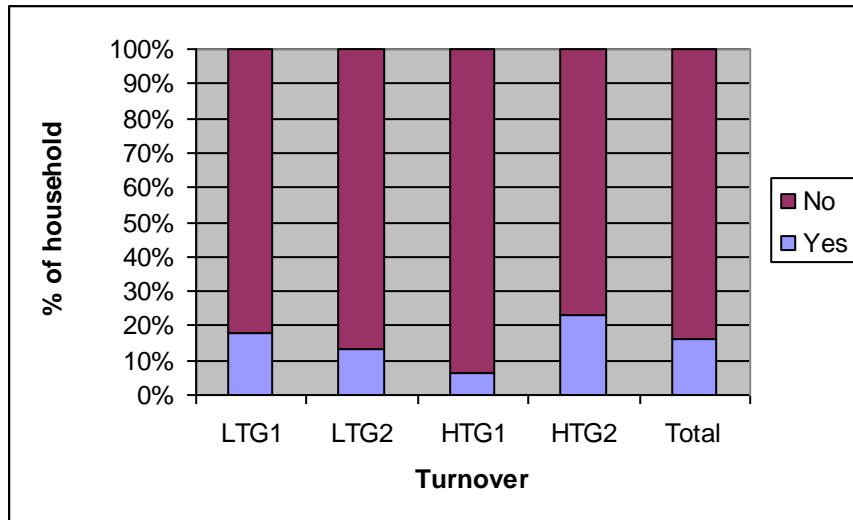
Figure 4.4: Financial support for the farming operation by turnover

NAFU is a mouthpiece of predominantly black small-holder farmers in South Africa. It strives to actively promote the interests primarily of black farmers who are from the previously disadvantaged farming community. It therefore represents the aspirations of those who have been disadvantaged, neglected and marginalized. Figure 4.5 shows the membership of NAFU between the turnover groups. The results show that most of the emerging farmers in all turnover categories are not members of NAFU.
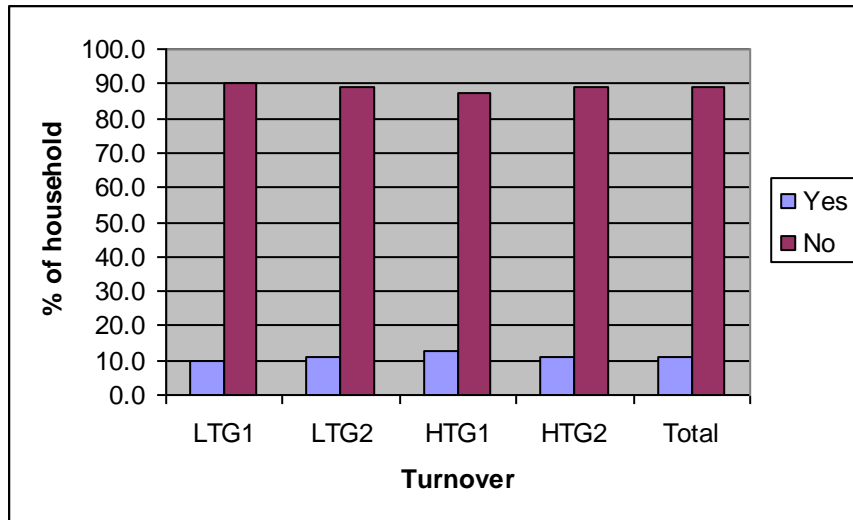
Figure 4.5: NAFU membership by turnover

Previous studies outlined that land shortage, financial assistance, lack of information, lack of access to markets, poor infrastructure, etc are the main constraints faced by small scale farmers. Table 4.9 shows the factors hampering emerging farmers to grow into commercial farmers by turnover. The results show that most of the emerging farmers in all the turnover groups are faced with a lack of finance. Some of the emerging farmers in the low turnover group are facing a land shortage while some of them in the high turnover group are facing a problem of lack of information and marketing skills.

Table 4.9: Factors hampering emerging farmers to develop into commercial by turnover

Factors hampering farmers to develop	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Land shortage	23.9	17.8	25.0	16.4	20.8
Lack of finance	48.3	52.1	37.5	45.2	48.1
Lack of information and marketing skills	9.8	14.8	27.1	20.5	14.7
Poor infrastructure	17.6	14.8	8.3	15.1	15.4
Other	0.5	0.6	2.1	2.7	1.0
Total	100	100	100	100	100

4.6   Water use and climate change

The sources of water in South Africa are diminishing and the result of this is that there is a limited amount of irrigation water available for previously disadvantaged groups, who have not had access to water or the authority structures that control water use and provision. This situation continues in most rural areas of South Africa and is aggravated by the fact that there is a limited amount of water available and the established white farmers retain most access to water and power to determine its use.

Table 4.10 shows the primary water sources used by farmers in the sample. The results shows that most of the emerging farmers (except in the HTG2) tend to use surface water, which includes dams, rivers, etc. Most of the emerging farmers in the HTG2 are using ground water, mostly boreholes. The other water source is rain which may be associated with the livestock and dry land farmers.

Table 4.10: Primary water sources by turnover

Primary water source	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Ground water	20.5	31.4	27.1	46.6	28.7
Rain water	11.7	18.3	20.8	9.6	14.5
Communal tap	19.0	7.1	8.3	5.5	11.9
Surface water	43.9	37.9	43.8	30.1	39.8
Other	4.9	5.3		8.2	5.1
Total	100	100	100	100	100

Climate change is not only about changes in the earth system, it is also about the impact of these changes on vulnerable communities. Climate change is happening and when all the impacts are added up, everyone will lose out sooner or later. Some people will adapt more successfully than others, and climate change may well result in a polarization of wealth and well-being in ways we have not seen before.

The figure 4.6 shows the proportion of emerging farmers affected by 2003/4 and 2004/5 drought by turnover. The results show that most of the emerging farmers in all the turnover groups were affected by the drought.
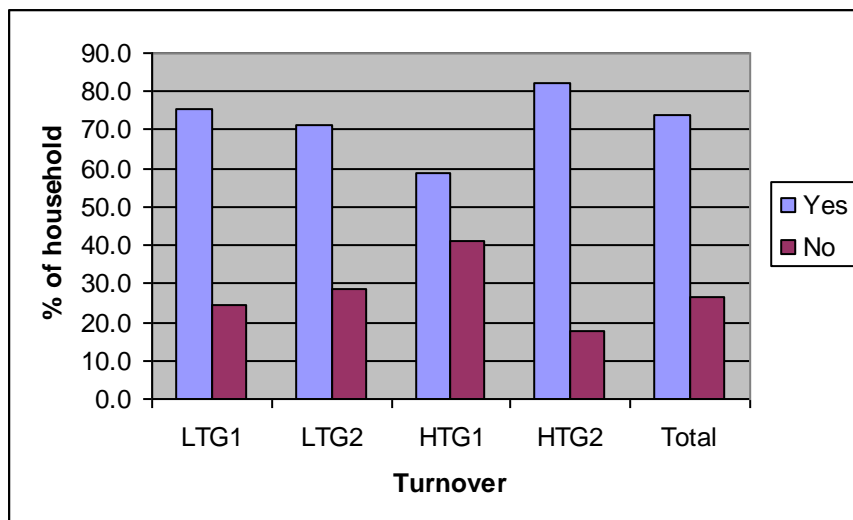
Figure 4.6: Emerging farmers whose area was affected by drought by turnover

4.7   Marketing

Marketing means the preparation and advertisement of agricultural products and includes the conveying, purchase and sale of agricultural products and any other act necessary to make agricultural products available for consumption or use. Market participation is based on the ability of households to sell all or some of their produce for cash. Lack of access to markets for smallholders is the reason even those farmers who manage to produce surplus cannot realize any profits from agriculture.

Emerging farmer's income is from the selling of output. Table 4.11 shows the proportion of emerging farmers selling their product by turnover. The results show that most of the emerging farmers in all the turnover groups sell their product by themselves/on their own. A small proportion sells through family and friends across all groups (except HTG2).

Table 4.11: Selling of the products by turnover

Selling strategies	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Self selling	85.9	89.9	91.7	89.0	88.3
Through family and friends	10.7	4.1	2.1		6.1
Other	3.4	5.9	6.3	11.0	5.7
Total	100	100	100	100	100

Transportation plays an important role in market development, expansion and competition. The size of the market area depends on whether products can be moved and cost of production. Table 4.12 shows the proportion of emerging farmers indicating how they transport the products by turnover. The results show that most of the emerging farmers in all the turnover groups (except the LTG1) use their own transport (bakkie/trucks). For most of the emerging farmers in the LTG1, the customers collect the products by themselves. There is a number of emerging farmers (18%) in the HTG2 who hire trucks to transport their goods.

Table 4.12: Transport of products by turnover

Transport	LTG1 (n=205)	LTG2 (n=169)	HTG1 (n=48)	HTG2 (n=73)	Total (N=495)
Own transport	18.5	39.1	60.4	58.9	35.6
Friend's transport	12.7	16.6	12.5	11.0	13.7
Group of farmers hire truck	7.8	7.7	2.1	4.1	6.7
Customers collect	45.9	22.5	18.8	8.2	29.7
Carry goods to destination	4.4	1.2	4.2		2.6
Hire transport	7.3	12.4	2.1	17.8	10.1
Don't transport	3.4	0.6			1.6
Total	100	100	100	100	100

4.8   Summary

This chapter has given a general overview of the demographic characteristics of emerging farmers in South Africa and also highlighted the environment in which the emerging farmers operate. This information has been presented in categories based on the different turnover groups of the farmers as classified in this study. Farm size, level of education, and distance to the infrastructure differ considerably between the different turnover groups. Understanding of socioeconomic variables that matter in determining farm turnover can enable more informed and better targeted policy responses and tailor-made farm support programmes. The next chapter presents more detailed analyses of the data in the study.

CHAPTER 5: FACTORS DISTINGUISHING EMERGING FARMERS[1]

5.1   Introduction

This chapter presents the results from two analytical techniques which are factor analysis and logistics regression. The main reason for use of factor analysis was that the study was faced with a large set of data which needed to be reduced to a small number of variables. After reducing the data size using factor analysis, logistic regression was then applied to determine those data variables that influence the turnover grouping of farmers. This provided the analytical information on the factors that distinguish low turnover emerging farmers from high turnover emerging farmers.

5.2   Factor Analysis

Based on the findings in the literature and the theoretical framework, a set of explanatory variables was chosen. These were variables reflecting farmers' access to and use of output infrastructure and support services.

Chapter 4 discussed a range of socio-economic indicators about emerging farmers. In order to reduce the dimensionality into limited number of socio-economic indicators, factor analysis was applied. This technique, which can be considered as a kind of data-reduction, makes it possible to measure the answers given to the original questions on a limited number of 'new dimensions'. These 'new dimensions' can subsequently be interpreted as common denominators reflecting shared underlying factors. The basic idea

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[1] Some of the results in this chapter were presented at the 44th AEASA conference in Grahamstown held on 20-22 September 2006

in factor analysis is that from a set of N variables (answers to specific survey questions) a set of M correlated descriptors (principal components) can be described. Each principal component is a suitable linear combination of the original variables. The first principal component accounts for the maximum variance in the original set of survey questions; the second is uncorrelated with the first and has the second largest variance and so on. Only those components with variances above a critical level are retained, thus reducing the original data set to a few variables (see Wichern and Johnson, 2002).

A rotated factor analysis was carried out on the data concerning the socio-economic characteristics using the SPSS package (2003). The Kaiser (1960) criterion was used for selecting the number of underlying M factors or principal components explaining the data. In this study, the number was decided by leaving out components with corresponding Eigen values of less than one. This is the rule of thumb when conducting principal component analysis (PCA) using a correlation matrix. This is so because an Eigen value corresponds with the number of variables in a factor and the sum of the Eigen values corresponds with the total number of variables. Therefore, if a factor is less than one that means that it accounts for variability of less than one variable.

The principal components factor analysis extraction method was used to analyse the patterns of access to output and support services. Principal components analysis uses the prior communalities of one, and therefore tends to inflate factor loadings, which makes identification of patterns relatively easier.

5.2.1 Patterns of access and utilization of output infrastructure

Output market infrastructure is the capital stock that provides the market for output produced by farmers. In particular, this aimed to determine the accessibility to and usage of output market infrastructure by emerging farmers. How one marketing channel is related to other marketing channels that farmers use? The objective of this section is to determine the patterns of access to output market infrastructure by emerging farmers.

Table 5.3 shows the rotated factor patterns for the output market infrastructure variables. Five factors were suggested by the criterion of Eigen values previously discussed. These factors were the true factors as they explained 71% of the variance in the 12 output infrastructure components. The five factors referred to are road condition to public market, road condition to local fresh produce market, road condition to family and friends, distance to output market, and percentage of produce to the output market.

Factor 1: Tarred road to the road store/public market

The first factor in the factor analysis, road condition to the road store/public market, explained 22% of the total variance in the 12 output infrastructure items. Tarred road to the road store/public market and the gravel road to the road store/public market were the items that loaded heavily in this factor. They had a different sign which implies that they are negatively correlated. This is to say that emerging farmers using tarred roads to reach the public market do not use the gravel road.

Table 5.1: Rotated factor patterns for access and use of output market infrastructure

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Commu Nality
% Of produce to family and friends	0.011	-0.193	0.325	0.086	0.017	0.151
% Of produce to road store/direct to public	-0.360	-0.138	-0.106	0.005	**-0.419**	0.350
% Of produce to local fresh produce market	0.086	0.010	0.068	0.069	**-0.813**	0.675
Distance to family and friends market (km)	-0.139	-0.013	-0.071	**0.689**	**0.428**	0.626
Distance to road store/direct to public (km)	0.147	0.016	0.073	**0.700**	-0.081	0.543
Distance to local fresh produce market (km)	0.001	0.086	-0.033	**0.595**	-0.352	0.503
Tarred road to family and friends market (%)	-0.073	0.138	**0.965**	-0.069	-0.031	0.968
Tarred road to road store/ public market (%)	**-0.929**	0.068	0.032	-0.044	0.073	0.885
Tarred road to local fresh produce market (%)	-0.037	**0.984**	0.036	0.052	0.012	0.981
Gravel road to family and friends market (%)	0.073	-0.138	**-0.965**	0.069	0.031	0.968
Gravel road to road store/direct to public (%)	**0.918**	-0.055	-0.132	0.001	-0.013	0.882
Gravel road to local fresh produce market (%)	0.037	**-0.984**	-0.036	-0.052	-0.012	0.981
% Of total variance explained	22.2	15.1	13.6	11.1	8.9	

Factor 2: Tarred Road to local fresh produce market.

The second factor in the factor analysis, road condition to the local fresh produce market, explained 15% of the total variance in the 12 output market infrastructure items. Tarred road to local fresh produce market and the gravel road to local fresh produce were the items that loaded heavily in this factor. They had a different sign which implies that they are negatively correlated. This is to say that emerging farmers using tarred road to reach the local fresh produce market do not use the gravel road.

Factor 3: Gravel Road to family and friends market

The third factor in the factor analysis, road condition to the family and friends market, explained 14% of the total variance in the 12 output infrastructure items. Tarred road to family and friends market and the gravel road to family and friends were the items that loaded heavily in this factor. They had a different sign which implies that they are negatively correlated. This is to say that emerging farmers using tarred road to reach the family and friends market do not use the gravel road.

Factor 4: Distance to the output market

The fourth factor in the factor analysis, Distance to the Output Market, explained 11% of the total variance in the 12 output infrastructure items. Distance to the family and friends, road store and local fresh produce were the items that loaded heavily in this factor. They all had a positive sign which implies that they are positively correlated, that is the output markets are similarly accessible together. That means that emerging farmers can save time and transaction costs by being able to access all the output markets in one place.

Factor 5: Percentage of Produce to the Output Market.

The fifth factor, Percentage of Produce to the Output Market, explained 9% of the total variance in the 12 output market infrastructure items. Percentage of output to road store and local fresh produce market were the items that loaded heavily in this factor. They all had a positive sign, which implies that they were positively correlated. This is to say that the percentage of produce to the output market was nearly the same.

5.2.2   Patterns for knowledge and awareness of support services

Support services such as access to finance, infrastructure, information and knowledge systems, are core pillars of sustainable empowerment initiatives. The objective of this is to determine the patterns of the knowledge and usage of support services aimed at emerging farmers.

Table 5.4 shows the rotated factor patterns for the support services variables. Four factors were suggested by the criterion of Eigen values previously discussed. These factors were the true factors as they explained 69% of the variance in the 11 support services components. The four factors referred to are the knowledge of project or support services aimed at emerging farmers, municipal services, NAFU membership and factors hampering emerging farmers developing into commercial farmers.

Factor 1: Knowledge of projects and programmes aimed at assisting emerging farmers

The first factor in the factor analysis, knowledge of projects, explained 27.3% of the total variance in the eleven support services items. Awareness of projects or support services aimed at emerging farmers, emerging farmers that are aware of agricultural projects, emerging farmers that form part of the agricultural projects and financial support for farming operations were the items that loaded heavily in this factor. They all had a positive sign which implies that they are positively correlated. Those farmers who were aware of emerging farmers' programmes were aware of agricultural projects around them and are more likely to participate in these projects.

Table 5.2: Rotated factor patterns for knowledge and use of support services

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Commu nality
Land shortage (%)	0.008	-0.207	0.128	**-0.767**	0.679
Financial support (%)	-0.006	-0.086	-0.010	**0.883**	0.769
Aware of projects aimed at emerging farmers (%)	**0.850**	0.096	-0.104	-0.154	0.753
Emerging Farmers that are aware agricultural projects (%)	**0.660**	0.035	-0.115	-0.252	0.505
Forming part of the project (%)	**0.902**	-0.027	-0.005	0.095	0.828
Emerging Farmers that are part agricultural projects (%)	**0.824**	-0.148	-0.014	0.135	0.730
Financial support for farming operation (%)	**0.577**	0.014	0.286	0.179	0.454
Agricultural inputs (%)	-0.004	**-0.879**	-0.007	-0.099	0.800
Infrastructure (%)	-0.012	**0.895**	0.028	-0.039	0.794
NAFU members (%)	0.071	-0.029	**-0.817**	0.149	0.685
Not aware of NAFU (%)	0.020	-0.001	**0.797**	0.020	0.637
% of total variance	27.3	17.2	12.9	12.0	

Factor 2: Municipal services

The second factor of factor analysis, municipal services, explained 17.2% of the total variance in the 11 support services items. Agricultural inputs and infrastructure were the items that loaded heavily in this factor. Both of the items had different sign which implies that they are negatively correlated, i.e emerging farmers that require infrastructure do not require land.

Factor 3: NAFU Membership

The third factor, NAFU Membership, explained 12.9% of the total variance in the 11 support services items. NAFU members and unawareness of NAFU were the items that loaded heavily in this factor. They had different sign which implies that they were negatively correlated. This means that emerging farmers that are not aware of the NAFU are not NAFU members, which is true.

Factor 4: Factor hampering emerging farmers to develop

The fourth factor, factor hampering emerging farmers to develop, explained 12% of the total variance in the 11 support services items. Land shortage and lack of financial support were the items that loaded heavily in this factor. They had different sign which implies that they were negatively correlated. According to the results, emerging farmers facing the problem of lack of land do not face the problem of financial support. Theoretically, emerging farmers facing the challenge of lack of land do face the problem of financial support.

5.3   Summary of factor analysis results

The results have shown that there are patterns that are observable in terms of access to output market infrastructure by emerging farmers. The most commonly used output markets by emerging farmers are family and friends, the fresh produce markets as well as public stores. The distance to the road store/public market is often the distance of the nearest market where farmers can sell their commodities. Friends and family also provide an important market for produce by emerging farmers. Improving road conditions and transport services in rural areas will not only improve accessibility of external markets, but will also improve accessibility of local output markets.

The implications of this finding is that it is important for policy planners to know that farmers access output markets in groups and the role of output market access will stimulate agricultural and rural development which cannot be overemphasized. Improved road and transport systems between output markets and rural areas, and within rural areas themselves will serve many purposes by giving farmers better access to family and friends, road store/public markets, local fresh produce market and other output markets, whilst also giving them better access to input and service markets. Constraints on land and finance also need to be addressed, whilst emerging farmers should be encouraged to join farmer organizations such as NAFU to enable them to benefit from the range of initiatives that government and other stakeholders are putting in place to facilitate the participation of emerging farmers in the market.

5.4 Factors of farm turnover

After the principal components (factor analysis) were estimated, a regression analysis was performed to study how the estimated factors influence emerging farmers' annual farm turnover. For this exercise, the farm turnover variable was again chosen as the dependent variable. The previously described estimated factors served as explanatory variables with their values being the factor scores (the score of each variable within the factor). The factor scores are scaled such that they have a variance of one and mean equals to zero.

A logit model was used in this study to determine the effect of the factors identified earlier on smallholders' farm turnover. The model was chosen because of the dichotomous nature of the dependent variable (i.e. farm turnover). Commercialization in this study can be defined by the level of turnover. Emerging farmers in the low turnovers groups are less commercial than emerging farmers in the high turnover groups. In this section the results of the six logistic regression models of farm turnover are presented. Model 1 identifies the factors associated with belonging to a high turnover group 2 (HTG2) rather than a low turnover group 1 (LTG1). Model 2 identifies the factors associated with belonging to a high turnover group 2 (HTG2) rather than a low turnover group 2 (LTG2). Model 3 identifies the factors associated with belonging to a high turnover group 2 (HTG2) rather than a high turnover group 1 (HTG1). Model 4 evaluates the factors associated with belonging to a low turnover group 2 (LTG2) rather than a low turnover group 1 (LTG1). Model 5 evaluates the factors associated with belonging to a high turnover group 1 (HTG1) rather than a low turnover group 1 (LTG1). Model 6

evaluates the factors associated with belonging to a high turnover group 2 (HTG2) rather than a low turnover group (HTG1).

The logit models are specified as:

P(TURNOVER) = β_0 + β_1FARSIZ + β_2FAROWN + β_3EDUC + β_4SUGA + β_5HORT + β_6LIVSTO + β_7TARPUB + β_8TARLOC + β_9GRAFAM + β_{10}DISOUT + β_{11} PEPOUT + β_{12}AWASUP + β_{13}NAFU + β_{14}GROWAT + β_{15}EFDROU + β_{16}CUSCOL + β_{17}SESEL

The model highlights that the probability of being in the high turnover group depended on 17 independent variables. The descriptions of the explanatory variables used in the model are represented in Table 5.3. Other variables were dropped because they did not have enough observations or were not significant in any model. Multi-collinearity problems were not indicated when a variable that was suspected of being collinear was removed while the significant levels of other variables were not affected. This table includes variables from the logistic and factor analysis. Table 5.4 and table 5.5 shows the logistic regression of the 6 models and the odd ratios for the level of turnover respectively.

Table 5.3: Definition of all the variables (includes variables from factor analysis) to be included in the logistic models

Variables	Description	Unit
Dependent variables:		
HTG2	1 if emerging farmers make a turnover of more than R100 000, 0 otherwise	Dummy
HTG1	1 if emerging farmers make a turnover of between R50 000 and R100 000, 0 otherwise	Dummy
LTG2	1 if emerging farmers make a turnover of between R10 000 and R49 999, 0 otherwise	Dummy
LTG1	1 if emerging farmers make a turnover of less than R10 000, 0 otherwise	Dummy
Independent variables:		
FARSIZ	Area used for farming	Ha
FAROWN	1 if the farmer is the owner, 0 otherwise	Dummy
EDUC	1 if the farmer has grade 8 or more, 0 otherwise	Dummy
SUGA	1 if the farmer is producing sugar; 0 otherwise	Dummy
HORT	1 if the farmer is in horticulture farming; 0 otherwise	Dummy
LIVSTO	1 if the farmers is livestock farming; 0 otherwise	Dummy
Infrastructure		
TARPUB	Tarred road to the public market	Factor
TARLOC	Tarred road to the local fresh produce market	Factor
GRAFAM	Gravel road to family and friends	Factor
DISOUT	Distance to the output market	Factor
PEPOUT	Percentage of produce to the output market	Factor
Support services		
AWASUP	Awareness of project or support services aimed at emerging farmers	Factor
NAFU	NAFU membership	Factor
Water use and drought effect		
GROWAT	1 if farmer uses ground water, 0 otherwise	Dummy
EFDROU	1 if farmer is affected by drought, 0 otherwise	Dummy
Marketing		
CUSCOL	1 if customers collect output from the farmer, 0 otherwise	Dummy
SESEL	1 if farmer sells on his own, 0 otherwise	Dummy

Table 5.4: Logistic regression of the 6 models

Variables	Model 1 HTG 2 vs LTG 1	Model 2 HTG 2 vs LTG 2	Model 3 HTG 2 vs HTG 1	Model 4 HTG 1 vs LTG 1	Model 5 HTG 1 vs LTG 2	Model 6 LTG 2 vs LTG 1
FARSIZ	0.005***	0.002***	0.004*			
FAROWN		-1.619***			-0.818*	
EDUC	1.167**	1.279***	-1.196*	1.652***	1.262**	
SUGA	3.008**	4.537***	2.329*			
HORTIC	-2.456**					
LIVSTO	-1.994*					
TARPUB					0.387*	
TARLOC	0.776***	0.436**		0.446**		
GRAFAM						-0.308**
DISOUT	1.120**		0.703*		-0.401*	0.418**
PEPOUT			-0.515*	1.172***		0.343**
AWASUP				-0.697**	-0.480*	
NAFU	0.838***		0.714**			
GROWA	0.587**	0.569**	0.637**	-0.453*		
EFDROU				-0.595**		
CUSCOL	-1.240***	-0.766***		-0.682**	-0.389*	-0.371***
SESELL	-0.617**					
Constant		-1.966**		-2.334**	-2.265**	
% correct predicted	90	84	79	88	81	66
Pseudo R^2	69	53	54	49	23	22
Model X^2	179.027***	112.516***	62.190***	91.704***	41.493***	67.784***

***, **, * represent significance at 1%, 5% and 10% respectively

Table 5.5: Odds ratios for the level of turnover

Variables	Model 1 HTG2 vs. LTG1	Model 2 HTG2 vs. LTG2	Model 3 HTG2 vs HTG1	Model 4 HTG1 vs LTG1	Model 5 HTG1 vs LTG2	Model 6 LTG2 vs LTG1
FARSIZ	1.005	1.002	1.004			
FAROWN		0.198			0.441	
EDUC	3.212	3.594	0.302	5.217	3.534	
SUGA	20.238	93.421	10.264			
HORTIC	0.086					
LIVSTO	0.136					
TARPUB					1.473	
TARLOC	2.173	1.546		1.563		
GRAFAM						0.735
DISOUT	3.063		2.021		0.670	1.518
PEPOUT			0.597	3.228		1.409
AWASUP			1.632	0.498	0.619	0.964
NAFU	2.311		2.042			
GROWA	1.798	1.766	1.891	0.636		
EFDROU	0.777			0.552		
CUSCOL	0.289	0.465		0.506	0.678	0.690
SESELL	0.540					
Constant	12	7	8	8	6	5

5.4.1 Model 1 (HTG2 vs LTG1)

The first model compared the socioeconomic characteristics of the high turnover group 2 with the low turnover group 1. The HTG2 had low number of respondents as compared to the LTG1. The value of one was assigned to being in the HTG2 and zero to being in the LTG1. The logistic regression results of the determinants of the process of belonging to HTG2 rather than the LTG1 are presented in Table 5.4.

Eleven of the 17 variables used in the model were significantly different from zero. The variables that were positively associated with belonging to the HTG2 relative to belonging to the LTG1 were the farm size (FARSIZ), level of education (EDUC), sugar cane as farming enterprise (SUGA), tarred road to the local fresh produce market (TARLOC), distance from the household to the output market (DISOUT), emerging farmers who are NAFU members (NAFU), and emerging farmers using ground water for production (GROWAT). Only 4 variables were negatively associated with being in the HTG2. Those are emerging farmers using the strategy of customer collect from the household to the market (CUSCOL), emerging farmers in the horticulture and livestock farming enterprise and emerging farmers having to sell their produce on their own (SESEL). The model correctly predicted 90% of the observations. The model chi-squared was significant at 1% level. That is, there was a significant relationship between the independent variables and the level of turnover. The pseudo R^2 was 69%.

The logit analysis suggests that emerging farmers in the HTG2 were more commercial than emerging farmers in the LTG1 because they had more access to land and they were exposed with formal eduacation. According to Table 5.5 the odds of becoming in the HTG2 (belonging to the HTG2 rather than LTG1) when the land is increased by a hectare was 1.005 times the odds of being in the HTG2 when the land is not changed. The odds of being in the HTG2 when the level of education is greater than grade 8 as compared to primary education were 3.212. Emerging farmers in the HTG2 were engaged in the sugar, while emerging farmers in the LTG1 were engaged in the horticulture and livestock enterprises. The odds of being in the HTG2 when the emerging farmers were in the sugar, horticulture and livestock enterprises were 20.238, 0.086 and 0.136 times respectively.

Emerging farmers in the HTG2 had access to good infrastructure. The odds of being in the HTG2 when the emerging farmer uses the tarred road rather than the gravel road to the local fresh produce market was 2.173. The odds ratio of being in the HTG2 when the distance from the household to the output market increases by one, was 3.063 times the odds of being in the HTG2 when the distance is not changed. The odds ratio of being a NAFU member as compared to not being a NAFU member is 2.311. Emerging farmers in the HTG2 use ground water and the odds ratio of using ground water as compared to other sources of water is 1.798. The odds ratio of letting the customers to come and collect their produce and self-selling the produce to the output market is 0.289 and 0.540, respectively.

Thus, the emerging farmers in the HTG2 differ from the emerging farmers in the LTG1 because they have more land, high level of education and accessible output market. They are also NAFU members and have access to ground water for production. Emerging farmers in this group were mostly engaged in the sugar cane enterprise, while emerging farmers in the LTG1 were engaged in horticulture and livestock farming.

5.4.2 Model 2 (HTG2 vs LTG2)

The low turnover group was categorized into two whereby the second one is the LTG2. Model 2 identifies the socioeconomic factors differentiating the HTG2 and the LTG2. Again the HTG2 was assigned the value of one while the LTG2 was assigned the value of zero. The results from the regression analysis are presented in Table 5.4.

Seven variables were significantly associated with being in the high turnover group 2. The variables that were positively associated with belonging to the HTG2 relative to belonging to the LTG2 were the farm size (FARSIZ), level of education (EDUC), sugar cane as farming enterprise (SUGAR), tarred road to the local fresh produce market (TARLOC), and emerging farmers using ground water for production (GROWAT). Emerging farmers farming on their own (FAROWN) and emerging farmers letting customers to collect their produce (CUSCOL) were negatively significant of being in the HTG2. The model correctly predicted 84% of the observations. The model chi-squared was significant at 1% level. That is, there was a significant relationship between the independent variables and the level of turnover. The pseudo R^2 was 53%.

The logit analysis suggests that emerging farmers in the HTG2 were more commercialized than emerging farmers in the LTG2 because they had access to more land with higher levels of education. The interesting part the analysis revealed is that emerging farmers in the LTG2 farm on their own as compared to emerging farmers in the HTG2. Emerging farmers in the HTG2 are likely to be involved in partnership and close corporations. Table 5.5 shows that the odds of being in the HTG2 when land is increased by one hectare was 1.002 times the odds of being in the HTG2 when the land is not changed. The odds of being in the HTG2 when the level of education is greater than grade 8 as compared to primary education was 3.594. The odds of being in the HTG2 when the emerging farmer uses the tarred road rather than the gravel road to the local fresh produce market was 1.546. Emerging farmers in the HTG2 use ground water and the odds of using ground water as compared to other sources of water is 1.766. The odds ratio of being in the HTG2 when emerging farmers are letting the customers collect the produce is 0.465.

Thus, the emerging farmers in the HTG2 differ from the emerging farmers in the LTG2 because they have access to land, a high level of education, are involved in sugar farming as well as having access to good infrastructure. Most of them were involved in partnership or close cooperative farming rather than farming on their own (individually).

5.4.3 Model 3 (HTG2 vs HTG1)

This model identifies the socioeconomic factors differentiating the HTG2 and the HTG1. Again the HTG2 was assigned the value of one while the HTG1 was assigned the value of zero. The results from the regression analysis are presented in Table 5.4.

Seven variables were significantly associated with being in the HTG2. The variables that were positively associated with belonging to the HTG2 relative to belonging to the HTG1 were the farm size (FARSIZ), emerging farmers in the sugar farming enterprise (SUGA), distance to the output market from the household (DISOUT), emerging farmers that are NAFU members (NAFU), and emerging farmers that have access to ground water (GROWAT).Only 2 variables are negatively significant of being in the HTG2 instead of being in the HTG1. Those are the level of education (EDUC) and percentage of produce to be sold to the output market. The model correctly predicted 79% of the observations. The model chi-squared was significant at 1% level. That is, there was a significant relationship between the independent variables and the level of turnover. The pseudo R^2 was 54%.

The logit analysis suggests that emerging farmers in the HTG2 were more commercial than emerging farmers in the HTG1 because they had access to more land with a high level of education. Table 5.5 indicates that the odds of being in the HTG2 when the farm size increases by a hectare is 1.004 times than when the odds of being in the HTG2 is not changing. Emerging farmers in sugar enterprise are likely to be in the HTG2 and the odds of being in the HTG2 when being in sugar farming was 10.264. The odds of being in the

HTG2 when the distance from the household to the output market increases by one, was 2.021 times the odds of being in the HTG2 when the distance does not change. Emerging farmers who were aware of project or support services aimed at them and being NAFU members were likely to be in the HTG2 as compared to the HTG1. The odds of being aware of project or support services aimed at emerging farmers and being NAFU members was 1.632 and 2.042 respectively.

The level of education was associated with emerging farmers in the HTG1. The odds of being in the HTG2 when the level of education is greater than grade 6 was 0.302. The odds of being in the HTG2 when the percentage of produce sold to the output market increases by one was 0.597 times the odds of being in the HTG2 when the percentage of product sold to the output does not change.

Thus, emerging farmers associated with the HTG2 differ from the emerging farmers associated with the HTG1 because they have access to land, are involved in sugar farming, have access to output markets, are aware of projects and support services aimed at emerging farmers and they are NAFU members. Emerging farmers in the HTG1 are educated and they manage to sell a large proportion of their output to the market.

5.4.4 Model 4 (HTG1 vs LTG1)

This model identifies the socioeconomic factors differentiating the HTG1 and the LTG1. The HTG1 was assigned the value of one while the LTG1 was assigned the value of zero. The results from the regression analysis are presented in Table 5.5.

Seven variables were significantly associated with being in the high turnover group 1. The variables that were positively associated with belonging to the HTG1 relative to belonging to the LTG1 were the level of education (EDUC), tarred road to the local fresh produce market (TARLOC), and percentage of produce to the output market (PEPOUT). Variables that were negatively associated with being in the high turnover group 1 were awareness of emerging farmers about the projects and support services aimed at them (AWASUP), emerging farmers using ground water (GROWAT), emerging farmers affected by drought (EFDROU), and emerging farmers letting customers come and collect their produce (CUSCOL). The model correctly predicted 88% of the observations. The model chi-squared was significant at 1% level. That is, there was a significant relationship between the independent variables and the level of turnover. The pseudo R^2 was 49%.

The logit analysis suggests that emerging farmers in the HTG1 differ from the emerging farmers in the LTG1 because they have a higher level of education and access to good infrastructure. Table 5.5 indicates that the odds ratio of being in the HTG1 when the level of education is greater than grade 8 as compared to primary education was 5.217. Emerging farmers in the HTG1 have access to good infrastructure and they manage to sell a certain percentage of produce through the output market. The odds of being in the HTG2 when the emerging farmer uses the tarred road rather than the gravel road to the local fresh produce market was 1.563. The odds of being in the HTG1 when the percentage of produce sold through the output market increases by one is 3.228 times the

odds of being in the HTG1 when the percentage remains the same. Emerging farmers who are aware of projects and support services aimed at emerging farmers, emerging farmers using ground water as the source of water, emerging farmers that were affected by the 2003/04 and 2004/05 drought and emerging farmers letting customers collect the produce from them were likely to be in the LTG1. The odds of being in the HTG1 were 0.498, 0.636, 0.552, and 0.506 respectively.

Thus, the emerging farmers in the HTG1 differ from the emerging farmers in the LTG1 because of a higher level of education and good infrastructure. Emerging farmers in the LTG1 were aware of projects and support services aimed at emerging farmers and have an awareness of drought.

5.4.5 Model 5 (HTG1 vs LTG2)

Model 5 identifies the socioeconomic factors differentiating the HTG1 and the LTG2. Again the HTG1 was assigned the value of one while the LTG2 was assigned the value of zero. The results from the regression analysis are presented in Table 5.4.

Six variables were significantly associated with being in the high turnover group 1. The variables that were positively associated with belonging to the HTG1 relative to belonging to the LTG2 were level of education (EDUC) and tarred road to the public market (TARPUB). Variables that were negatively associated with being in the LTG2 were emerging farmers farming on their own (FAROWN), distance from the household to the output market (DISOUT), awareness of the projects or support services aimed at

emerging farmers (AWASUP), and emerging farmers letting the customers collect the produce from the market (CUSCOL). The model correctly predicted 81% of the observations. The model chi-squared was significant at 1% level. That is, there was a significant relationship between the independent variables and the level of turnover. The pseudo R^2 was 23%.

The logit analysis suggests that emerging farmers in the HTG1 differ from the emerging farmers in the LTG2 because they have a high level of education and a good and accessible infrastructure. Table 5.5 indicates that the odds of being in the HTG1 when the level of education is greater than grade 8 as compared to primary education was 3.534. Emerging farmers in the HTG1 have access to good infrastructure. The odds of being in the HTG1 when the emerging farmer uses the tarred road rather than the gravel road to the public market is 1.473.

Emerging farmers that are aware of projects and support services aimed at them are likely to be in the LTG2. The odds of being in the HTG1 when emerging farmers are aware of projects or support services is 0.619 times. The odds of being in the HTG1 when emerging farmers let customers collect their produce is 0.678 times.

Thus, the emerging farmers in the HTG1 differ from the emerging farmers in the LT2 because of high level of education and good infrastructure. Emerging farmers in the LTG2 are engaged in individual farming, are aware of projects and support services aimed at emerging farmers and they let customers come and collect the output from them.

5.4.6 Model 6 (LTG2 vs LTG1)

Model 6 identifies the socioeconomic factors differentiating the LTG2 and the LTG1. Again the LTG2 was assigned the value of one while the LTG1 was assigned the value of zero. The results appear in Table 5.4.

Four variables were significantly associated with being in the low turnover group 2. The variables that were positively associated with belonging to the LTG2 relative to belonging to the LTG1 were distance from the household to the output market (DISOUT) and percentage of produce sold to the output market (PEPOUT).Variables that were negatively significant with being in the LTG2 are gravel road to the family and friends as well as the emerging farmers letting customers collect the produce from them (CUSCOL). The model correctly predicted 66% of the observations. The model chi-squared was significant at 1% level. That is, there is a significant relationship between the independent variables and the level of turnover. The pseudo R^2 is 22%.

The logit analysis suggests that emerging farmers in the LTG2 are more commercial than emerging farmers in the LTG1 because they have access to output market. Table 5.5 indicates the odds ratio of being in the LTG2 when the distance from the household to the output market increases by one, is 1.158 times the odds of being in the LTG2 when the distance is not changed. The odds of being in the LTG2 when the proportion of produce sold to the output market increases by one is 1.409 times the odds of being in the LTG2 when the proportion of output market is not changed. Emerging farmers who were aware of projects or support services aimed at them are likely to be in the LTG1. The odds of

being in the LTG2 is 0.964. The odds ratio of being in the LTG2 when emerging farmers let customers collect their product from them is 0.690.

Thus, emerging farmers associated with the LTG2 differ from emerging farmers associated with the LTG1 because they have access to output markets and sell more of the output to the output market. Emerging farmers in the LTG1 are aware of the projects or support services aimed at them.

CHAPTER 6: SUMMARY, KEY FINDINGS AND POLICY IMPLICATIONS

6.1 Introduction

This chapter reviews the main findings of the study and discusses the conclusions to be derived from the empirical results. Specifically the chapter discusses the extent to which research questions and hypotheses posed at the beginning of the study have been addressed by the analysis. The chapter makes practical recommendations on the best ways to improve the agricultural sector in smallholder areas in order to enhance the welfare of agriculture. In addition, several suggestions are advanced for further research.

This chapter is presented in four sections. The study is summarized in section 6.1. Section 6.2 presents the conclusions of the study. Section 6.3 presents a general overview and the policy implications for accelerating commercialization in South Africa. Section 6.4 makes recommendations for future studies.

6.2 Summary

The general objective of the study was to identify the factors that distinguish low turnover emerging farmers from high turnover emerging farmers in South Africa. The first objective was to determine the socio-economic factors distinguishing low turnover emerging farmers from high turnover emerging farmers in South Africa. The second objective was to determine the patterns of access to infrastructure (services, output and

input) by emerging farmers. The third objective was to determine the constraints faced by the emerging farmers in South Africa. The fourth objective was to identify the factors that influence the degree of commercialization or market participation. The last objective was to recommend strategies for improving market access of the emerging farmers in South Africa.

Chapter two reviewed the theoretical and empirical literature on emerging farmers in South Africa. The chapter found out that there are a lot of factors affecting the market access and the income of emerging farmers. Demographic factors such as education, infrastructural factors such as distance to the services, road conditions, lack of support services, etc. tend to distinguish the categories of emerging farmers by the level of annual farm turnover as that is the first hypothesis of the study. The second hypothesis as that poor infrastructure and lack of support services are the greatest constraint faced by emerging farmers. This hypothesis was tested in chapter six by analyzing the results of the models of emerging farmers by turnover.

A set of analytical techniques was used. Descriptive statistics were employed to differentiate the socioeconomic factors by the level of turnover. Factor analysis was also employed to investigate the interrelations between the infrastructural variables and support services. The final step pertaining to identifying the social and economic factors that were associated with the level of turnover was the logistic model with which estimated and significant variables were identified.

6.3   Key findings

Infrastructure, support services and market access are the most important aspects for the viability of small scale agriculture. A major reason why even those farmers who can produce surpluses remain trapped in poverty is lack of access to profitable markets. Factors influencing emerging farmers' access to markets are widely discussed in literature and often form a part of the complex web of factors that affect emerging farmers in general.

This study attempts to determine the extent of the influence of these factors using the data from the DBSA and MSSA collected across the nine provinces of South Africa. Factor analysis was performed with the aim of reducing the data and to avoid multicollinearity problem among the variables and yielded a number of factors interpreted in the previous chapter.

Further regression using some of the factors (principal components) as well as the demographic and farm characteristics as explanatory variables revealed the most significant variables as being farm size, land ownership, level of education, farm enterprise (sugar, horticulture and livestock), infrastructure [road conditions to the output market (public market, local fresh produce market and family and friends), average distance to the output market and average percentage of output taken to the market], support services (awareness of projects or support services aimed at emerging farmers and NAFU membership), ground water and farmers affected by the 2003/04 and 2004/05 droughts as well as marketing (self-selling and customers collecting output from the

farm). The analysis has shown that a wide variety of factors influence the probability of a farmer achieving high turnover. These factors are discussed below.

Farm size

Farm size was operationalized by the variable total land area used by the household (FARMS). The variable was statistically significant for model 1, 2 and 3 which compared the high turnover group 2 and low turnover group 1, high turnover group 2 and low turnover group 2 and the high turnover group 2 and high turnover group 1 respectively. It was not surprising that the variable was not significant in other models because the descriptive analysis suggests little variation in land holding across the other groups. The logit results suggest that when the farm size increases by a hectare, the odds ratio of becoming in the high turnover group increases significantly. As expected, emerging farmers with higher farm sizes are likely to have higher turnover than those farmers with lower farm sizes. The results clearly suggest that emerging farmers in the low turnover groups might respond positively if they had more land. Farmers have complained, and the results of this study suggest, that land has been a serious constraint to those emerging farmers who wanted to expand. So, land reforms should be considered that would make it possible for farmers who face a land constraint to gain access to more land.

Land ownership

The different types of legal entities prevalent amongst emerging farmers are classified in the study as individual, farming as part of a cooperative, as a close corporation or partnership. The type of ownership is negative and significant for model 2 which

compares the high turnover group 2 with the low turnover group 2. It is negatively related to the probability of a farmer being in the high turnover group 2. This perhaps indicates that those emerging farmers who decide to farm as individuals are in the low turnover group. On the other hand those farmers who are in partnerships or close corporations are likely to have higher farm turnover.

Level of education

The variable education has a positive effect on the level of turnover for model 1, 2, 4 and 5. This implies that emerging farmers who have more years of education are likely to fall into the high turnover groups than those farmers who have fewer years of education. Higher education is normally associated with the greater capacity to utilize information and to manage a business, hence resulting in higher turnover.

Higher value enterprise Sugar

The coefficient of the dummy variable 'sugar' is positive and significant in the first 3 models of turnover. There is a positive association between one being a sugar farmer and the likelihood of a farmer attaining high turnover. Sugar is a high value commodity and compared to other enterprises is likely to result in higher turnover for farmers who grow it.

Horticulture and livestock

The dummy variables 'horticulture' and 'livestock' are negatively significant for model 1. There is a negative association between one being a horticulture or livestock farmer and the likelihood of a farmer attaining high turnover. This simply implies that emerging farmers in the horticulture and livestock enterprises are likely to be in the low turnover groups.

Infrastructure

Infrastructure was operationalized by 5 variables; tarred road to the public market (TARPUB)**,** tarred road to the local fresh produce market (TARLOCA), gravel road to the family and friends (GRAFAM), distance from the household to the output market (DISOUTPUT), and percentage of produce to the output market.

The variable TARPUB was statistically significant for model 5 while TARLOCA was statistically significant for model 1, 2 and 4 and GRAFAM was statistically significant for model 6. This implies that road condition to the output market (public and local fresh produce market) is related to the probability that a farmer is in the high turnover group 1. Road condition to the family and friends is negatively related to the farmer being in the low turnover group 2. This implies that farmers in the low turnover group 1 as compared to the farmers in the low turnover group 2 enjoy good road conditions to the family and friends. If infrastructure is in better condition, farmers might face less transportation costs and will be more likely to sell more of their produce and also fetch better prices.

The distance to the output market variable is positively significant to models 1, 3 and 6 and negatively significant for model 5. This implies that emerging farmers in the high turnover groups have better access to the output market than emerging farmers in the low turnover groups.

The variable average percentage of produce to the output market is positively significant for model 4 and 6 while negatively significant for model 3. For model 4 and 6, this implies that there is a positive relationship between the percentage of produce that a farmer takes to the output market and the probability that a farmer falls into the high turnover group. As expected farmers who take more of their produce to the market are likely to have higher turnover than those farmers with a less marketable surplus.

Awareness of projects or support services aimed at emerging farmers

Awareness of project or support services aimed at emerging farmers (AWASUP) is operationalized by the percentage of emerging farmers that are aware of projects or support services aimed at emerging farmers. The variable AWASUPP is negatively significant for model 4 and 5. This finding is not surprising because the descriptive analysis suggests that most of the emerging farmers in the entire turnover group are aware of projects or support services aimed at them. The challenge was that most of the emerging farmers in the entire turnover groups were not able to access or form part of those project or support services.

NAFU membership

NAFU is operationalized by the emerging farmer forming part of NAFU. This variable is positively significant for model 1 and model 3. This implies that emerging farmers who tend to be NAFU members tend to be associated with the high turnover group.

Ground water

Water source was operationalized with emerging farmers using ground water for agricultural purposes. This variable was positively significant for model 1, 2 and 3 while negatively significant for model 4. The result implies that mainly emerging farmers using ground water are mainly associated with the high turnover group. For emerging farmers to have access to ground water they have to access to resources. Only emerging farmers having money to do boreholes fall in the high turnover group.

Effects of drought

The effects of drought were operationalized by the emerging farmers that were affected by 2003/4 and 2004/5 drought. The variable (EFDROU) was negatively significant for model 4, which implies that emerging farmers who were affected by drought are likely to have a lesser chance of being in the high turnover group. This may be because emerging farmers in the high turnover group had access to resources so as to prevent a loss caused by drought while emerging farmers in the low turnover groups do not have resources to withstand drought.

Customer collect

Customer collecting the produce from the output market was operationalized by the variable CUSCOL. The variable is negatively significant for all the models except model 3. According to the descriptive analysis, emerging farmers who use their own transport are associated with the high turnover group while emerging farmers who allow customers to collect their goods are associated with the low turnover group. The factor analysis result shows that emerging farmers who transport their produce do not mainly use the strategy of customer collect.

Self-selling strategy

Successful marketing is the key to the economic progress of emerging farmers. Self-selling strategy was operationalized by the variable SESEL. This variable is negatively significant for model 1 which implies that emerging farmers who sell their produce by themselves are associated with being in the low turnover group.

The analysis has shown that a variety of factors influences the probability of a farmer achieving high turnover. In this study factors such as the age of the farmer and the sex of the farmer did not seem pertinent to levels of farm turnover. It should be noted that this particular issue needs further investigation. Infrastructural factors such as the road condition to the local produce market raise important issues which were not explored in many previous studies. The study has shown that infrastructural variables are as important a factor in determining farm turnover as are other socio-economic variables such as education, farm size and the type of farm business that a farmer owns. Over-all

factors such as farm size, education level of emerging farmers, road conditions (both local fresh produce market and public market), transport and other support services and type of farming enterprises can be targeted by policy makers to assist low farm turnover emerging farmers to move into the high farm turnover classes of emerging farmers.

The empirical results support the first hypotheses, as the study found that there are significant differences between the turnover groups. Generally, emerging farmers having more land, emerging farmers with a high level of education are likely to be in the high turnover group than their counterparts. Socio-economic factors distinguish high turnover emerging farmers from low turnover emerging farmers. The findings from chapter 5 support the second hypothesis that was made. According to factor analysis, the output markets are in a package form. The logistic results support the third hypothesis as the study found that there are a lot of constraints faced by emerging farmers. Those constraints are poor infrastructure, lack of transport, lack of information about marketing, etc.

6.4   Policy recommendations

Several policy implications can be drawn from the results of the study. The implications apply to farmers' organization, farmers, extension organizations, financial institutions and policy-makers. Policies at the national level, as well as projects and programmes undertaken by provincial departments of agriculture emphasize equitable access to agriculture and promote the contribution of agriculture to the development of rural communities. The creation of an environment that will provide emerging farmers with

access to services and resources in order to promote own growth and prosperity is necessary. In order to improve access to resources and support services, a more comprehensive and encompassing farmer support programme is recommended.

The policy required to encourage commercialization must be tailored to the needs of the different categories of emerging farmers in South Africa. The low turnover group of farmers appears to contain community garden farmers. These farmers will require the comprehensive set of programmes that are commonly recommended. The programmes include land reform, educational programmes, infrastructural services, marketing and credit facilities, crop insurance, as well as transportation.

The direction of the impact of land size on household commercialization has certain implications for the South African land reform programme. This study suggests that various tenure reform arrangements need to be explored. Emerging farmers in the LTG must be given more land to operate on. This arrangement will ensure that productive and efficient farmers capable of operating large viable land sizes do expand or have access to an additional land, i.e., farmers will farm on land sizes that match their productive capacity. It is therefore recommended that institutions that promote efficient use of land should receive priority attention in policy-making.

The education level of the majority of emerging farmers in the low turnover group is low, while they are continuously confronted with new technology. Various training techniques can be applied for farmers who are illiterate. Farmers will have to acquire new

technological and administrative skills and receive training and extension to keep up with changes. Research programmes must be undertaken in consultation with farmers and not by research institutes.

Infrastructure is generally better accessible to emerging farmers than before. Investing in the growth and development of rural town centres will have positive benefits for emerging farmers, by making services more easily accessible.

For farmer organizations like NAFU, in particular, perhaps the most important lesson is the need to make sure that farmers in the LTG are being reached and helped, as most of them said that they are not aware of NAFU. The NAFU also needs to engage in programmes of farmer education and consultation so that farmers know exactly what the organization can offer them, and the NAFU also knows exactly what the farmers expect from it as an organization.

The most basic incentive for farmers to increase agricultural production is the assurance that there will be a market for their products at a profitable price. Emerging farmers generally need special assistance to organize them and get access to marketing channels. There is a group of commercially oriented farmers who have the necessary entrepreneurial to make a success of possibly larger, more viable farming enterprises. By providing opportunities, incentives and using some of the criteria suggested in this study for farmer selection, it will undoubtedly be possible over time to increase the number of successful black commercial farmers in South Africa.

There are some implications for policy-makers in government. The needs of emerging farmers are different and as such people responsible for delivering the services of institutions such as finance, extension and farmer organizations should approach the different emerging farmers using different strategies. It is important to seek out the needs and opinions of the farmers themselves before providing them with a service, as provision of a service farmers think they do not need may be a waste of resources that could be better used elsewhere.

For policy-makers, this study and other similar studies help to identify those factors that distinguish the low turnover emerging farmers from the high turnover emerging farmers in South Africa. Those factors that have been identified as important can be targeted in the policy formulation process to help all the emerging farmers to move into the high turnover group and thereby speed up the commercialization process.

6.5   Recommendations for further studies

The main objective of the study was to identify factors that distinguish the low turnover emerging farmers from the high turnover emerging farmers in South Africa. The ultimate goal was to contribute to the knowledge base concerning the overview of emerging farmers in the whole of South Africa as there are not enough studies that were conducted for the country. Most of the studies that were conducted in the past were focused on a specific group or a target area. This section strongly recommends further investigation of

emerging farmers in South Africa taking a number of socio, economic, technical and cultural factors into consideration.

To deal with the issue of insufficient information, dummy variables had to be used. The dummy variables assume two values; 0 and 1, that is, they provide information on whether a case was true or not. In many instances where dummy variables were used in this study, continuous variables would have provided better information. This was the case with variables like level of farm turnover and education. In this study factors such as the age of the farmer and the sex of the farmer did not seem pertinent to levels of farm turnover. It should be noted that this particular issue needs further investigation.

The study was based on the 2005 agricultural season survey and thus does not account for household behavior over time. However, commercialization is a dynamic process and over a period households' behavior may change. The issue in this case is whether the households in the low turnover group (such as LTG1) will move to a high turnover group (such as HTG1) through time. It will also be interesting to examine the conditions under which the low turnover groups of emerging farmers move to a higher turnover group.

As the data used for this study was collected across the nine provinces of South Africa, future studies can be done province by province to compare the characteristics of emerging farmers in South Africa.

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