

**INTEGRATION OF EMERGING COTTON FARMERS INTO THE COMMERCIAL
AGRICULTURAL ECONOMY**

By

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DEDICATION

This study is dedicated to the loving memory of my dad, Mr Nndanganeni Johannes Randela. I am with you today, as always.

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Rendani wa ha Randela

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Abstract

The broad objective of the study was to generate information that will facilitate the integration of small-scale emerging agriculture into the South African economy.

The specific main objectives were to:

- Identify the constraints to market participation and commercial orientation of the small-scale emerging farmers;
- Identify potential successful and unsuccessful farmers;
- Assess the potential role of joint venture initiatives as a commercialization model;
- Assess the impact of market participation to farmers' livelihoods and their welfare in general;
- Analyse both the structure and performance of the cotton industry as well as the profitability of the cotton crop;
- Discuss the implications of the findings for policy and possibly additional research necessary to improve small-scale agriculture.

The study was conducted in two cotton growing regions of the Mpumalanga Province, namely Moutse and Nkomazi. A sample of 177 small-scale cotton growers was drawn from emerging cotton growers. The basis for analysing and understanding of the major factors behind the success or failure of small-scale farmers' commercialisation lies within the New Institutional Economics school of thought. Contract farming is an institutional marketing arrangement widely used by sample farmers to reduce transaction costs. Its main advantage is that it offers farmers a guaranteed market. For processing companies (ginners) the advantage is that production is more reliable and guaranteed than open market purchases. As a result of guaranteed market, cotton has the highest commercialisation index of 0.99 and 1 in Moutse and Nkomazi respectively. The main challenge facing the continuation of contract farming is the non repayment of loans with a resultant decline in the level of support that farmers receive

Cotton plays an important role in the farmers' livelihood in terms of employment, income, household gender relations and food security. The role of cotton in rural development is, however, constrained both by external and internal factors. Low international prices arising mainly as a result of subsidy policies in the wealthy countries constitute the greatest limiting factor to cotton farmers in developing countries.

Profitability analysis shows a gross margin of R1 072 per hectare in Moutse which is 52% higher than Nkomazi gross margin. Three main critical variables that influence the profitability of cotton production are production levels, costs and price as influenced by the quality of seed cotton produced. Break-even analysis reveals that when price is set at R3.65/kg, the break-even yield for Moutse and Nkomazi is estimated to be 1 073kg and 917kg per hectare of seed cotton respectively. When the seed cotton price declines larger quantities of seed cotton have to be produced to break-even.

Cluster analysis revealed two main groups of farmers categorised according to their entrepreneurial skills, namely very successful and less successful farmers. The very successful group is dominated by a group of relatively young farmers

with a high level of entrepreneurial skills. In addition, this group has a relatively high percentage of risk takers (10%) compared to 2% for less successful farmers.

The hypothesis that transaction costs and other closely related factors influence commercialisation was empirically tested using logistic regression. Statistically significant factors were found to be age, ability to speak English, region, ownership of transport, access to market information, distance to market, dependency ratio, trust, ownership of livestock and land size. The results do not support the hypothesis that the level of commercialisation increases with land size. A unit increase in land size decreases the probability of commercialisation by 17%.

In view of these findings, the following policy proposals are suggested: There is a need to develop a typology of small-scale cotton producers in order to operate different kinds of credit schemes based on farmers' level of production, yield and perceived risk. Secondly, contract farming is the future of agricultural production and marketing and should therefore be promoted. In this regard, there is a need for a well developed and efficient legal system in which the government has a role to play. Thirdly, consolidation of farmers' organisation is critical. If well developed, banks should, *inter alia*, consider group lending through working with effective farmers organisations.

Finally, successful integration of small-scale agriculture relies heavily on the selection of beneficiaries. Future research studies should take cognisance of non-homogeneity of small-scale farmers and their aspirations. There is a need for a study that focuses on attributes of a successful entrepreneur and such attributes should be used for the selection of land reform beneficiaries.

Key words: *Emerging farmers, Integration, Formal economy, Cotton, Livelihood, Commercial farming, Profitability, Success potential, Market participation,*

INTEGRASIE VAN OPKOMENDE KATOENBOERE IN DIE KOMMERSIELE LANDBOU-EKONOMIE

Deur

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Samevatting

Die studie het ten doel gehad om inligting te genereer wat die integrasie van kleinskaalse opkomende boerdery in die Suid-Afrikaanse ekonomie kan aanhelp. Spesifieke hoofdoele was om:

- Die beperkings tot markdeelname en kommersiele oriëntering by kleinskaalse opkomende boere te identifiseer;
- Potensieel suksesvolle en onsuksesvolle boere te identifiseer;
- Die potensiele rol van gesamentlike ondernemings inisiatiewe as 'n kommersialiseringsmodel te beoordeel;
- Die impak van markdeelname op boere se lewenspeil en algemene welvaart te beoordeel;
- Beide die struktuur en prestasie van die katoenbedryf asook die winsgewendheid van die gewas te ontleed;
- Die implikasies van die bevindings vir beleid asook moontlike addisionele navorsingsbehoefte wat nodig is om kleinskaalse boerdery te verbeter, te bespreek.

Die studie is uitgevoer in twee katoenproduserende streke in Mpumalanga Provinsie, naamlik Moutse en Nkomazi. 'n Steekproef van 177 kleinskaalse katoenboere is getrek. Die basis vir analise en begrip van die hoof-faktore onderliggend aan sukses of mislukking van die kommersialisering van kleinskaalse boere val binne die gedagteskool van die Nuwe Institusionele Ekonomie. Steekproefboere maak heelwat gebruik van kontrakboerdery as institusionele bemarkingsmodel om transaksiekoste te verlaag. Die belangrikste voordeel is 'n gewaarborgte mark vir boere. Verwerkers (pluismeulens) verkry die voordeel dat dit lei tot meer betroubare en gewaarborgte produksie as met ope mark aankope. Weens die gewaarborgte mark het katoen die hoogste kommersialiseringsindeks van 0.99 en 1 in Moutse en Nkomazi onderskeidelik. Die grootste uitdaging vir die voortsetting van kontrakboerdery is die nie-betaling van lenings met 'n gevolglike afname in die peil van ondersteuning wat die boere ontvang.

Katoen speel 'n belangrike rol in die boere se bestaan met betrekking tot indiensneming, inkome, die huishoudings se geslagsverhoudings en voedselsekuriteit. Katoen se rol in landelike ontwikkeling word egter beperk deur eksterne asook interne beperkings. Lae internasionale pryse hoofsaaklik weens subsidiebeleide in die ryk lande vorm die belangrikste beperkende faktor vir katoenboere in ontwikkelende lande.

Wisgewendheidsanalise toon 'n brutomarge van R1072 per hektaar in Moutse, 52% groter as die brutomarge in Nkomazi. Produksiepeil, koste en prys soos deur gehalte beïnvloed is drie belangrike kritiese veranderlikes wat 'n uitwerking op die wisgewendheid van katoenproduksie het. Gelykbreekanalise toon dat met 'n prys R3.65/kg, die gelykbreek opbrengs in Moutse en Nkomazi onderskeidelik 1073 en 917kg saadkatoen per hektaar is. Wanneer die saadkatoenprys daal, moet groter hoeveelhede saadkatoen geproduseer word om gelyk te breek.

Trosanalise identifiseer twee hoofgroepe boere gekategoriseer volgens hul entrepreneuriale vaardighede, naamlik hoogs suksesvolle en minder suksesvolle boere. Die hoogs suksesvolle groep word oorheers deur 'n groep betreklike jong boere met 'n hoe peil van entrepreneuriale vaardighede. Hierdie groep bevat ook

'n betreklik groter persentasie risiko-aanvaarders (10%) vergeleke met 2% vir die minder suksesvolle boere.

Die hipotese dat transaksiekoste en ander nou-verwante faktore 'n invloed het op kommersialisering is empiries getoets met behulp van logistiese regressie. Ouderdom, bedrewendheid in Engels, streek, eienaarskap van vervoer, toegang tot markinligting afstand na die mark, afhanklikheidsverhouding, vertrouwe lewendehawe besit en plaasgrootte was statisties betekenisvolle faktore. Die resultate van die studie ondersteun nie die hipotese dat die peil van kommersialisering met meer grond toeneem nie. 'n Toename van een eenheid in plaasgrootte verlaag die waarskynlikheid van kommersialisering met 17%.

Gebaseer op hierdie bevindings word die volgende beleidsvoorstelle aan die hand gedoen: Dit is nodig om 'n tipologie van kleinskaalse katoenboere te ontwikkel teneinde verskillende tipes kredietskemas, gebaseer op boere se produksiepeil, opbrengs en waargenome risiko te bedryf. Tweedens is kontrakboerdery die toekomst van landbouprodukie en –bemarking en dit behoort aldus bevorder te word. In hierdie opsig is daar 'n behoefte aan 'n goed ontwikkelde en doeltreffende wetsraamwerk waarin die regering 'n rol te speel het. Derdens is konsolidasie van boere se organisasie krities. Wanneer dit goed ontwikkel is, behoort banke onder andere groeps- kredietverlening te oorweeg deur met effektiewe boere-organisasies saam te werk.

Laastens is suksesvolle integrasie van kleinskaalse landbou grootliks afhanklik van die keuse van begunstigdes. In toekomstige navorsingstudies behoort daar behoorlik ag geslaan word op die nie-homogeniteit van kleinskaalse boere en hul aspirasies. Daar is 'n behoefte vir 'n studie gefokus op eienskappe van 'n suksesvolle entrepreneur en sulke eienskappe behoort gebruik te word in die seleksie van begunstigdes van grondhervorming.

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LIST OF ACRONYMS

AGOA	Africa Growth and Opportunity Act
ARC	Agricultural Research Council
BEA	Break-Even Analysis
<i>Bt</i>	<i>Bacillus thuringiensis</i>
CF	Contract Farming
DCCS	Duty Credit and Certificate Scheme
EU	European Union
FC	Fixed Cost
FSP	Farmer Support Programme
FTA	Free Trade Agreement
GM	Genetically Modified
GM	Gross Margin
Ha	Hectare
HCI	Household Commercialisation Index
HSPH	High Success Potential Households
IIC	Institute for Industrial Crops
Kg	Kilogram
Km	Kilometer
LRAD	Land Redistribution for Agricultural Development
LS	Less Successful
LSPH	Low Success Potential Households
MADC	Mpumalanga Agricultural Development Corporation
MP	Mpumalanga Province
MPDA	Mpumalanga Provincial Department of Agriculture
MPCS	Marketing and Planning Consulting Services
MSPH	Moderate Success Potential Households
NIE	New Institutional Economics
NSK	Noordelike Sentrale Katoen
P	Price
Q	Quantity
R	Rand
RSA	Republic of South Africa

SLAG	Settlement and Land Acquisition Grant
SA	South Africa
SACTMA	South African Cotton and Textile Manufacturers' Association
SADC	Southern Africa Development Community
SPSS –SA	Statistical Package for Social Sciences – South Africa
SSA	Sub-Saharan Africa
TC	Total Cost
TR	Total Revenue
USA	United States of America
VC	Variable Cost
VLSPH	Very Low Success Potential Households
VS	Very Successful

CHAPTER ONE

INTRODUCTION

1.1 Background

South African policy distortions created a farming structure dominated by large-scale farmers based on capital-intensive production techniques and relatively extensive land use. White commercial farmers, in particular, enjoyed several benefits in terms of research, access to credit, markets and other components necessary for a formidable commercial farming. On the other hand, most black farmers have had limited access to land and capital, and have received inadequate support services such as research and extension. This resulted in a chronically low standard of living and reliance to a greater or lesser extent on subsistence production.

Other measures established under the system of apartheid prohibited black farmers in particular from forming co-operatives and farmer organizations participating in output and input markets. The legislative and other measures of institutionalized discrimination against black farmers were partly responsible for the dual nature of South Africa's agricultural sector (Van Zyl and Kirsten, 1997). Government established farmer settlement schemes in the former homelands to maximize the utilization of natural resources in the national interest, to generate income and to appease homeland governments. On many of these schemes, production, marketing and management functions were performed by parastatals or government appointed private companies. The recent withdrawal of the parastatals from these schemes led to the total collapse of the schemes.

Because of the legacy of exclusion and discrimination in South African agriculture, a major aim of the agricultural policy in South Africa is to "improve the incomes, employment possibilities and the overall quality of life of the rural poor" (Ministry of

Agriculture and Land Affairs, 1998). As part of the rural development component of the presidential imperatives, the government aims to integrate small-scale agriculture into the commercial sector of the South African economy through increases in productivity and greater market orientation. Thus the challenge now is to unlock the talents and creative energy of people and improve their participation in every facet of the sector and rid it once and for all of the many barriers noted in its historical dualism.

However, in this age of market liberalization, globalisation and expanding agribusiness, there is a danger that small-scale farmers will find difficulty in fully participating in the market economy. In many countries these farmers run the danger of becoming marginalized as larger farms become increasingly necessary for a profitable operation. In this regard, however, Cotton South Africa was, *inter alia*, established as a result of the abolition of Cotton Board at the end of 1997. One of its essential functions is the facilitation of the development of the emerging cotton production sector. The main objective set by Cotton South Africa is that 30% contribution of domestic crop be derived from emerging farmers by the year 2005. It drives this objective by way of the small-scale cotton farmers forum which aims to coordinate and monitor progress and to provide an environment where positive interaction between role players could lead to increased market access.

1.2 Motivation

Subsistence agriculture entails large inefficiencies in resource allocation that poor countries can ill-afford. Subsistence farmers are amongst the poorest and the most vulnerable of all groups. According to Heltberg and Tarp (2001), the need for increased agricultural commercialization is nowhere else as evident as in Sub-Saharan Africa. Integrating traditional agriculture into the exchange economy is therefore important for stimulating rural economic growth and development. Equally important too is that an economy that is not growing cannot integrate all its citizens into that economy in a meaningful way. This is echoed by president Mbeki when he stated : *“No economy can meet its potential if any part of its citizens is not fully integrated into all aspects of that economy” (Mbeki, 2003).*

Rural development through investment in small-scale agriculture is one of the national priority areas identified by the South African government. To achieve the government's objective of black economic empowerment and poverty alleviation, the South African agricultural policy, *inter alia*, aims to address problems faced by black farmers in general. The most notable problem involves the barriers to market participation faced by small-scale farmers. Small-scale farmers are often constrained in what they can produce by limited marketing opportunity. Farmers will not cultivate unless they know they can sell their crop; traders and processors will not invest in ventures unless they are assured that the required commodities can be consistently produced, *ceteris paribus*.

Successful agricultural development in South Africa requires farmers to change from subsistence to commercial farming. However, there are conflicting views on how commercialization can affect the poor. A pessimistic view argues that commercialization of agriculture has mainly negative effects on the employment, incomes, food production, consumption, health and nutrition of the poor. On the other hand the optimistic view argues hold that commercialization of agriculture plays a major role in stimulating agricultural growth and alleviating poverty (Binswanger and Von Braun, 1991). A study by Von Braun and Kennedy (1994) refutes the views expressed by the pessimists and they argue that this conclusion emerged from a mix of historical, real, and ideological factors as well as methodologically faulty analysis. In addition, this view has continually been questioned by policy makers in developing countries as well as aid agencies *etc.*

The view that commercialization plays a major role in stimulating agricultural growth and alleviating poverty is now widely accepted. There are a number of reasons behind choices made by many governments of developing countries in which commercialization can be advantageous to the majority of rural poor. These reasons are well documented in Von Braun and Kennedy (1994) and are discussed below:

- Maintenance of home consumption. Smallholder producers consciously try to maintain subsistence production along with new commercial production. The reliance on food from own production under household control is, *inter alia*, a

response to high transaction costs and risks related to markets, and production. It can largely be viewed as an insurance policy of farm households in a response to a risky income environment

- Employment. Commercialization of agriculture entails a substantial expansion of demand for hired labour. Except for tobacco, cotton is the most labour intensive crop to grow. It is estimated that for every hectare of cotton being planted, at least 1.25 job opportunities are created (Cotton South Africa, undated)
- Increased income. The potential of small-scale agriculture is much greater than has been acknowledged to date (Van Zyl and Kirsten, 1997). Given the necessary support, the contribution of agriculture to household income (averaging 15-20%) in the rural areas of the former homelands can double or triple, thereby reducing dependency on declining levels of remittances. Moreover, growth of commercial, small-scale agriculture can also generate more foreign exchange to be employed elsewhere in the economy through an increase in agricultural exports and a reduction of the import-intensity of current agricultural production
- Increased spending. With rising income from commercial crops, absolute spending for food consumption increases, as does diet quality.

The development of markets, trade and the subsequent market participation that characterize commercialization are fundamental to economic growth. At the household level, if a farmer increases production with the purchase of new farm inputs, (s)he must also sell products to pay for the inputs. Therefore, society requires commercialization so that agriculture can make its necessary contributions to general economic development. These include food for the growing cities, often a supply of agricultural exports and a rural market. These all require farmers to sell some of their production.

Successful integration of small-scale agriculture into the commercial agricultural economy advances partly the objectives of black economic empowerment in South Africa. One of the fundamental challenges of this initiative is the meaningful participation, in a sustainable manner, of previously disadvantaged communities into

the mainstream economy. However, processes of industrialisation either pose a threat or a window of opportunity to South Africa's small-scale agriculture. Apart from the industrialization process, the increasing liberalization in world agricultural markets, as well as the range of domestic market reforms in developing countries has a non-desirable impact on small-scale producers worldwide (Kirsten and Sartorius, 2002).

There are two forces driving the industrialization process: a new consumer and a new producer (Drabenstott, 1995). The market for products in developing countries is increasingly driven by consumer preferences that are influenced by shifting demographics as well as growing appreciation for the link between diet and health. Of a particular concern is the effect of all these developments on the future of small-scale agriculture in developing countries. Readon and Barret (2000), cited by Kirsten and Sartorius (2002) document evidence of how these changes have resulted in small firms and farmers being further marginalized and others going out of business under the new competition pressures leading to industrial concentration with practices that lead to the exclusion of domestic firms and small farmers from the benefits and rewards of the high-value markets. Thus the key issue is the establishment and promotion of a commercialization institution that can help and ensure that the poor people benefit from the opportunities presented by globalisation and industrialization, if the objective of the black economic empowerment is to be achieved.

1.3 Problem Statement

Since 1990, several processes have taken place to reverse discriminatory legislation and to improve participation while at the same time several other initiatives have been implemented to deregulate and liberalise the agricultural sector. Some of the main policy shifts in this regard include:

- Deregulation of the marketing of agricultural products;
- Land reform, consisting of the restitution, redistribution and tenure reform programmes and
- Institutional reforms including the governance of agriculture.

Although various efforts to establish black commercial farmers have been noted in the recent past years, South African agriculture continues to struggle with the empowerment of those who were denied opportunities under apartheid. The process is about giving disadvantaged communities and individuals more choices, removing the dualism in agriculture and fully integrating the agricultural sector. This process of enabling black South Africans to be farmers in their own right will require well designed efforts to level the playing field and to bring about a more diverse agricultural sector. One of the most notable programmes aimed at leveling the playing field is land reform. However, not only access to land, but also access to other resources and services such as water, capital, access to reliable and rewarding market and other agro-support services are critical in achieving meaningful and sustainable empowerment in agriculture. Ongoing reforms are important tools for increasing market participation but do not always address the most hidden reasons for non- participation.

The most important step towards food security remains the provision of productive employment opportunities through land reform, job programmes and the re-organisation of the economy (Watkinson and Makgetla, 2002). Access to markets should be seen as an important component of land reform and the small-scale farmer empowerment process. The challenge for South Africa is thus to ensure that black farmers who obtain land under the land redistribution programme do have something to sell, have access to markets and do make a decent living. Providing opportunities and opening up markets for high value commodities need to be viewed as an integral part for a successful land reform programme. Land redistribution is a necessary condition for a sustainable development, but not a sufficient one. Productive employment through land reform can only be realized when farming is viewed as a business where beneficiaries can earn income and make a decent living.

To date, post land settlement support to participants in the land reform programme has been organized on an *ad hoc* basis while its impact has had partial results at best. At the same time, support services to farmers in the former homelands areas have all but collapsed. In addition, the main aim of the farmer support programme (FSP) that was established in 1987 was the promotion of structural change away from

subsistence agricultural production towards commercial agriculture. It appears that it has never been clear as to how such participation should take place. Generally, efforts to establish black commercial farmers have been noted in the past 7 years and it appears that a lot more needs to be done to make any difference in terms of creating a unified and integrated agricultural sector that makes a significant difference in farmers livelihood and their general welfare. The private sector has been involved for many years in increasing the participation of small-scale agriculture into the exchange economy. Most of such initiatives are noticeable in Kwazulu-Natal Province within the cotton and sugarcane industries. In spite of all the past initiatives to transform small-scale agriculture, large-scale white commercial agriculture still continues to control the majority of all the lucrative market. For instance, 90% of the South African cotton producers are regarded as small-scale farmers but they contribute less than 10% of the value of cotton production.

With the above in mind, the following research problems will guide and give the direction to the study

- Taking into consideration the market potential for small-scale agriculture, what are the prospects and potential of producing on a sustainable way based on market principles?
- What are the institutional arrangements and constraints that inhibit or facilitate the empowerment of black farmers in the integration of small-scale agriculture into the commercial agricultural economy?
- What contribution can a study of this nature make in terms of generating research results that offer alternative ways necessary for the promotion of small-scale farmers into the exchange economy?

In spite of the considerable institutional energy and funds invested in small-scale development in the recent past, there appears to be little success that justifies returns to such investment.

1.4 Objectives of the study

The broad objective of the study is to generate information that will facilitate the integration of the small-scale emerging agriculture into the South African economy.

The specific objectives are to:

- Identify the constraints to market participation and commercial orientation of the small-scale emerging farmers;
- Identify potential successful and unsuccessful farmers;
- Understand better how commercialization arrangements linking smallholders and marketing/processing firms have been structured so that their successful ingredients can be replicated and incorporated more broadly into commercialization strategies;
- Assess the potential role of joint venture initiatives as a commercialization model;
- Assess the impact of market participation to farmers' livelihoods and their welfare in general;
- Analyse both the structure and performance of the cotton industry as well as the profitability of the cotton crop;
- Discuss the implications of the findings for policy and possibly additional research necessary to improve small-scale agriculture;

1.5 Hypotheses

In this study, it is hypothesized that:

- Small-scale farmers' participation in the product market is adversely affected by high transaction costs such as transport, information and searching costs;
- Commercialization and improved market access may benefit other economic activities such as food crop production.
- The household commercialization index increases as a function of area cultivated. Similarly, the market potential and revenue from crop sales are affected by farm size.
- Increased market access impacts positively on farmers' livelihood and their general welfare.

1.6 Methodology

1.6.1 Sampling procedure and sample size

It is difficult to give precise rules on what sample size is suitable. The suitable sample does not depend on the size of the population nor does it have to include a minimum percentage of that population. However, Bless and Achola (1995) argue that one of the major issues in sampling is to determine samples that best represent a population so as to allow for an accurate generalization of results.

A very important issue in sampling is to determine the most adequate size of the sample. The major criterion to use when deciding on the sample size is the extent to which the sample's size is representative of the population. Systematic sampling was performed in this study for the following reasons:

- It is fast and a convenient sampling method;
- It is intuitively more representative of the population than some other samplings method such as simple random sampling.

Care was taken in dealing with a periodicity problem in the population as this would have caused biased results. In addition, the sample was drawn with replacement. The intention was to get a sample of 200 emerging cotton producers in the study zones.

1.6.2 Questionnaire

The study made use of questionnaires as a tool through which information can be elicited from the farmers. The questionnaire can be used in three different ways, viz. in personal interviews, telephonic interviews and mail interviews. This project made use of the personal interviews mainly because it enables the interviewer to observe behaviour that the questionnaire is not designed to detect. The questionnaire was designed to capture information on households' demographics, production and farming practices, marketing information, extension and any other support information (see appendix). Personal interviews were supplemented with informal conversational interviews with some staff members of major stakeholders (Land Bank, Delta Pine, Clark Cotton etc) in the cotton industry. In addition data that has been acquired by other people, published and unpublished is also considered useful in this study so as to avoid time wasted in repeating studies.

1.6.3 Study Areas

Small-scale cotton production is produced mainly in four South Africa's Provinces namely, Mpumalanga, Kwazulu Natal, North-West and Limpopo. The differences in areas pose a problem to researchers of how to choose an appropriate study area. Moreover, there is always a problem when the researcher has to make a decision as to whether a single site or several sites will be sufficient to give a better picture of the study.

The type of data needed for an investigation of this nature is seldom, and certainly not in this case, available on time series bases; the problem clearly requires cross-sectional analysis. Because of time and lack of resources, the data collected and used in this study was based on a single visit survey of 200 small-scale farmers situated mainly on traditional cotton growing schemes. With advice from Cotton South Africa, surveys were conducted in schemes situated in the two regions of Mpumalanga Province, Moutse and Nkomazi (see Figure 1.1). The study was designed and implemented in collaboration with Cotton South Africa, Institute for Industrial Crops of the Agricultural Research Council, Human Sciences Research Council and the Mpumalanga Provincial Department of Agriculture.

Moutse forms part of what is known as Mpumalanga (MP) Highveld. Mpumalanga Highveld includes the Loskop valley irrigated farmlands, Loskop Dam and the town of Groblersdal to the north. The highveld region of MP covers a wide area of high altitude grasslands from the Gauteng border on the western boundary to the edge of the eastern escarpment. The highveld is also a major agricultural and maize growing area, producing exceptionally high yields consistently.

Nkomazi forms part of what is commonly known as the Mpumalanga Lowveld. The Lowveld region of Mpumalanga is part of the area now termed the Maputo-Nelspruit corridor. To the east, Nkomazi borders Mozambique while to the south it borders Swaziland.

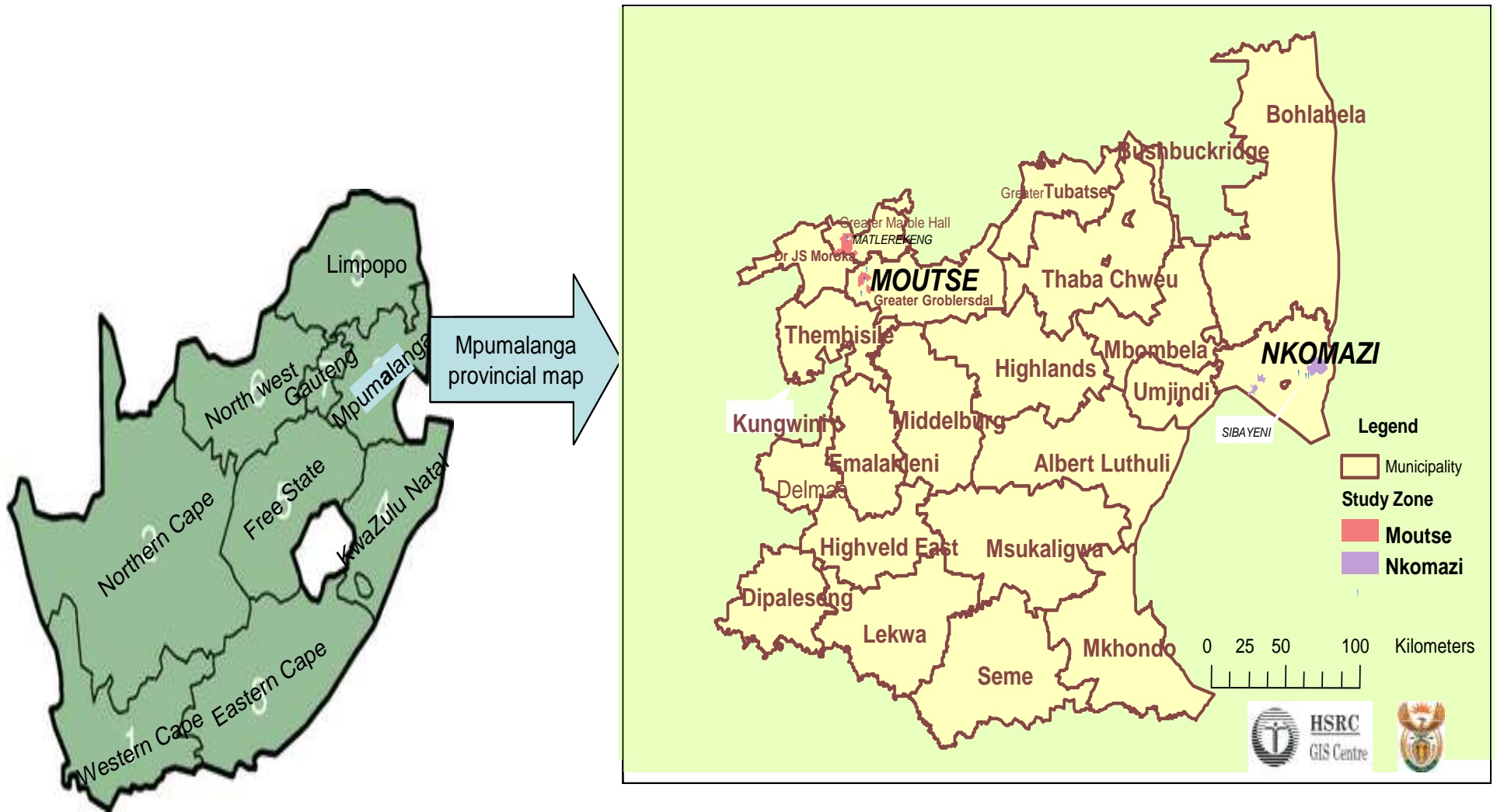


Figure 1.1 South African Map showing Study zones

1.6.4 Research Design and Implementation

The Integrated Rural and Regional Development Unit of the Human Sciences Research Council requested the Mpumalanga Provincial Department of Agriculture for active participation and collaboration with regard to the project survey. This was followed by a visit to the study zones to meet with the extension officers of the respective study zones. The purpose of the project was explained to the extension officers as well as to the few farmers met on the day. The questionnaire was pre-tested with the farmers and minor modifications were made. Emerging cotton growers were notified of the researchers' (fieldworkers) return to conduct personal interviews with the farmers.

Table 1.1: The Number of the sampled Households in the Study Areas

	<i>Moutse</i>	<i>Nkomazi</i>	<i>Total</i>
Number of farmers actually interviewed	77	100	177
Number of cotton growers	55	98	153

Interviews were carried out by five fieldworkers with a post-matric qualification. Their proven competence and enthusiasm minimized the need for training. Moutse is sub-divided into three sub-regions namely, Moutse East, Moutse Central and Moutse West. It is for this reason that three fieldworkers were allocated to conduct surveys in Moutse. The actual number of farmers who participated in the surveys is, however, less than the targeted number of 200 as shown in Table 1.1. This can be ascribed to the unavailability of farmers and uncooperative behaviour by some emerging cotton producers. This reduced the number of actual respondents to 177. Of the 177 sample farmers, 153 grew cotton as their main crop for the production season under review (2001/02) and for the purpose of analysis these will be referred to as cotton growers. The total sample is about 90% of the targeted sample, and is considered large enough to be representative. Surveys were carried from November 2003 to January 2004.

1.6.5 Analytical framework

This section briefly identifies the theoretical model that will guide the empirical analysis. The study will be conducted within the logistic regression framework. This model is preferred mainly because it yields the highest predictive possible given a set of predictors. The model can be expressed as follows:

$$\text{Log} \left(\frac{P_{(y=1)}}{1-P_{(y=1)}} \right) = \beta_0 + \sum_{i=1}^n \beta_i \chi_i \text{ or as } \left(\frac{P_{(y=1)}}{1-P_{(y=1)}} \right) = e^{(\beta_0 + \sum_{i=1}^n \beta_i \chi_i)}$$

Where P is the probability that $y=1$ and χ_i are the set of explanatory variables. In this analysis χ will contain both dichotomous and continuous variables. In the second expression in equation (1) the left-hand side is an odds ratio and the right hand side gives the marginal effects of χ_i on the odds.

Given that most households market some of their crop production, it is necessary for the study to develop a proxy that captures the variation in terms of the intensity of commercialization. The dependent variable in this regard is the household commercialization index (HCI). HCI can be defined as (gross value of all crop sales_{hh1,year}/gross value of all crop production_{hh1,year}). This index measures the extent to which household crop production is oriented to the market. A value of zero would signify a totally subsistence-oriented household; the closer the index to 100, the higher the degree of commercialization. An important issue concerning HCI is the extent to which it provides consistent estimates of commercialization overtime. The examination of the consistency of this variable requires time series data. Regrettably, time series data is hardly available for small-scale farmers and where available it is highly unreliable. Another important concern raised by Strassberg (1997) about the suitability of the HCI for the analytical purpose is the degree to which household commercialization reflects farm size. To partly curb this problem the study will incorporate farm size as an exogenous variable.

The exogenous variables will include transaction costs, demographic variables, and those variables that characterize the capital endowment of the farm such as farm size. An attempt will also be made to take into consideration geographical

differences amongst the regions. Living in a risky area is clearly associated with less commercialization.

Literature review reveals some methods used by various authors to determine factors affecting small-scale farmers' commercialization. Matungul, Lyne and Ortmann (2002) used a marketing method index as a dependent variable reflecting the level of commercialisation. The model was specified as marketing methods index as a function of transaction cost, farmers and households characteristics.

Marketing methods index is an index showing depth in marketing methods used by the households. The index was, *inter alia*, calculated taking into account various marketing channels used by the sampled farmers as well as different techniques used to inform potential customers about their products. In contrast with the research mentioned, cotton producers in particular market to a single buyer (ginners) and rarely produce other marketable products.

Makhura, Coetzee and Goode (1996) applied a method of qualitative choice to determine primarily the relationship between socio-economic characteristics of farmers and their commercialisation. This was done by estimating logit models to identify characteristics that differentiated one commercialisation class from another namely, high agricultural commercial households, moderately commercial households and very low commercial households. In addition, Makhura *et al* (1996) operationalised commercialisation by developing sources of earnings from sales of agricultural products while others operationalised it by employing surplus production. The latter is flawed because marketing behaviour is a two-step decision process: firstly, the household decides whether or not to participate in the market, and secondly establishes how much to sell. Important to note is that the choice of method is primarily dictated by the problem under evaluation and to a certain extent by the nature of data.

1.7 Outline of the Study

This dissertation will be organized in eight chapters. To achieve the study's objective, in Chapter Two the study will begin with a literature review focusing on

the commercialization of small-scale farming in developing countries. Special consideration will be given to two commercialization models namely, contract farming and co-operatives, widely used in developing countries. Chapter three focuses on the past and current status of the South African cotton industry. Emphasis will be on the marketing of cotton before and after liberalization of the South African economy.

Chapter four will provide demographic data concerning the sample and descriptive statistics concerning household characteristics, livelihoods and level of market participation. The chapter will end with an attempt to understand the impact of cash crop to household food security and farmers' general welfare. This is followed by Chapter Five that analyses the profitability of small-scale cotton production. Chapter Six proceeds with a focus on characteristics and attributes of potential successful and unsuccessful entrepreneur/farmers. In Chapter Seven, empirical tests of various hypotheses will be conducted and the results discussed. There will be special reference to constraints to market participation. The final Chapter (Chapter Eight) summarises the key findings of the study and discusses the conclusion and policy recommendations for the future.

LITERATURE REVIEW

2.1 Introduction

South African agriculture is characterised by dual sectors, subsistence agriculture that is largely black, and on the other hand a commercial sector, which is largely white. It is for this reason that the South African agricultural sector strategy is the creation of a united and prosperous agricultural sector. The immediate concern, *inter alia*, for the South African agriculture is the levelling of the playing field with equal access to rewarding markets as one of the main objectives. The greatest challenge in this regard lies in the ability to successfully integrate the subsistence sector into an exchange economy. The factors inhibiting this sector from participation in the market economy include high transaction and information costs.

This chapter will provide a literature review on issues relating to the commercialisation of small-scale agriculture. To achieve this objective, this chapter kicks-off with a theoretical framework based on the New Institutional Economics (NIE) as a school of thought that provides the basis for analysing and better understanding of the major factors behind the success or failure of small-scale farmers' commercialisation in developing countries. The chapter proceeds by offering the definitional aspects of the term institution as the main determinant of economic performance.

Identification of appropriate rural institutions to incorporate rural people into business opportunities is a major priority for relevant policy research. In this regard the discussion continues with a focus on two complementary rural institutions that enhance market access, namely contract farming and participatory farmer cooperatives. The rationales for commercialisation, as well as the main problems associated with it are also highlighted in the chapter. This is followed by a

discussion on the implications for public policy emanating from the commercialisation pathway or process. The tail-end of the chapter concludes with some recommendations.

2.2 Genesis of New Institutional Economics

New Institutional Economics (NIE) developed as a result of the flaws of neoclassical economics. The neoclassical economics is largely based on the assumption of perfect competition. The basic underlying assumption of the neoclassical economics is that exchange is a frictionless and a costless process and it contends that where costs exist these are passive and therefore not important. In addition, the neoclassical economics provides the theoretical underpinning of structural adjustment and assumes that exchange arises spontaneously from the atomistic interaction of self-seeking individuals. In essence, the neoclassical economics relies on the universal concepts of supply and demand. It makes the market an abstraction devoid of institutional detail and regards the firm as what Cormier (2001) calls , a “black box”.

North (1989) argues that the neoclassical model which has served as the basis of economic reasoning for most scholars holds only under the severely restrictive assumptions of zero transaction costs; but positive transaction costs cause institutions to matter. As a result, Oliver Williamson (1985) coined the phrase the “New Institutional Economics (NIE)”, which is a vast and a relatively new multidisciplinary field that includes aspects of economics and other social sciences. The NIE does not fundamentally challenge the precepts of neoclassical economics but criticises it for failing to explain the nature of institutions and the role they play in supporting the existence and operation of markets. Institutions, according to Stein (1994), exist as a means of reducing transaction and information costs so that markets can operate efficiently. To quote North, information processing by the actors as a result of the costliness of transaction underlies the formation of institutions (North, 1990: 170).

NIE has various branches, but there is as yet no consensus on what is included in the NIE. However, there are broad and general salient approaches namely

transaction and information cost on the one hand and the theory of collective action on the other. Only transaction and information cost economics will be considered for the purpose of this study. Transaction cost economics predicates that the cost of transacting as determined by institutions and institutional arrangements is the key to economic performance. It argues that the institutions of a country such as its legal, political and social systems determine its economic performance.

In NIE, some of the unrealistic assumptions of the neoclassical model (such as perfect competition, zero transaction cost) are relaxed, but the assumptions of self seeking individuals attempting to maximise an objective function subject to constraints still holds (Poulton, Dorward, Kydd, Poole and Smith, 1998). In addition, institutions are incorporated as an additional constraint.

Williamson developed an analytical framework within which to analyse transaction costs based largely on Ronald Coase's (1937) article, "The nature of the firm". By definition, transaction costs include the costs of gathering and processing the information needed to carry out a transaction, of reaching decisions, of negotiating contracts, and of policing and enforcing those contracts (Williamson, 1985). Similarly, they include the cost of searching for a partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading partners (and officials) to reach an agreement, transferring the product, monitoring the agreement to see that its conditions are fulfilled and enforcing the exchange agreement.

Williamson presents four basic attributes that organise transactions and economic activity:

- Specificity of assets
- Frequency of transaction
- Uncertainty pertaining to resulting performance of a transaction
- Difficulty in measuring performance of a transaction

The purpose of the NIE is both to explain the determinants of institutions and their evolution over time and to evaluate their impact on economic performance, efficiency and distributional implications (Nabli and Nugent, 1989). Like Williamson, North (1990) suggests that institutions change as communities' rules of the game change in the long run. An important component of the NIE approach is the acknowledgement that economies perform differently because of the way institutions evolve. There appears to be a two-way causality between institutions and economic growth as identified by Nabli and Nugent (1989) as well as Kherallah and Kirsten (2001). Institutions have a profound influence on economic growth and on the other hand economic growth and development result in a change in institutions. It is important to note that not all institutional changes are beneficial to general economic welfare.

2.3 Defining Institutions

Different authors have used quite different definitions, each emphasizing quite different aspects or characteristics of a more general phenomenon. Aspects or characteristics of institutions receiving differential attention in definitions include the degree to which they are (Nabli and Nugent, 1989: 1334):

- Organisational, i.e. the extent to which organisations and institutions coincide;
- formal or informal;
- created at a specific time and place; and
- universal as opposed to particularistic in the interest they serve.

In spite of the above, the most commonly agreed upon definition for institutions is a set of formal laws, contracts, political systems, organisations, markets etc. and informal rules of conduct, norms, traditions, customs, value systems and religion that facilitate coordination or govern relationships between individuals or groups (North, 1989; Kherallah and Kirsten, 2001: 5). North argues that institutions guide and reduce uncertainty in human interaction and they have an influence on our behaviour and ultimately on outcomes such as economic performance, efficiency, economic growth and development.

2.4 Application of NIE to development

In order to understand the application of NIE to small-scale agricultural development it is important to consider the following paragraph from North (2000) as quoted and well documented in Kherallah and Kirsten (2001: 16)

“The cost of transacting, to put it in its bluntest form, is the key to economic performance. When I go to third world countries and look at why they perform badly and examine how factor and product markets are really working, in every case, be it capital, labour or product markets, one observes that the cost of transacting is high. The costs of transacting results in the economy performing badly because it is so costly for human beings to interact and engage in various kinds of economic activity that the result is poor performance and poverty and so on.”

Small-scale producers in less developed countries face many hidden costs that make it difficult for them to gain access to markets and productive assets. Transaction and information costs rate among the barriers that may be influenced by policy. The cost of transacting does in every case come down to the fact that the institutional framework provides the incentives or disincentives for efficient production and incentives for people to engage in activities. Differential transaction cost among smallholders stems from asymmetric access to assets, information, services and remunerative markets (Holloway, Nicholson and Delgado, 1999).

Handling market access problems requires institutional innovation. This section intends to consider trends in the commercialisation of subsistence agriculture that has potential to catalyse market participation, enhance the velocity of transactions and sustain economic growth in rural communities. The topic is contract farming (CF) as a typical commercialisation model applied in many developing countries. In addition, the importance of participatory cooperatives as a catalyst to market participation will be highlighted.

2.4.1 Farmer Cooperatives, Organisations and Joint actions

Holloway *et al* (1999) argue that a common form of collective action that addresses market access is a participatory, farmer-led cooperative that handles inputs purchasing, distribution and output marketing, usually after some form of bulking or processing. In principle, cooperatives constitute a very favourable instrument for improving small farmers' bargaining power on the market and channelling to them new inputs and technologies (Abbott, 1993). Cooperatives are institutional arrangements, the importance of which has re-emerged recently to organise small farmers in some developing countries in the age of market liberalisation. By definition, a farmer cooperative is an organisation usually incorporated, owned and controlled by agricultural producers, which operates for the mutual benefit of its members as producers or patrons (Rehber, 1998). The advantages of cooperatives as advanced by Holloway *et al* (1999) and Kherallah and Kirsten (2001) include, *inter alia*:

- Farmers gain the benefit of assured supplies of the right inputs at the right time, thus a reduction in the transaction costs of accessing both input and product market.
- Improvement of the negotiation power of smaller farmers vis-a vis large buyers or sellers.
- By providing bulking and bargaining services, cooperatives increase outlet market access and help farmers avoid the hazards of being encumbered with a perishable crop with no rural demands.
- Co-operatives can also provide the option of making collateral to farmers.
- Extension is sometimes part of the services provided, typically at higher rates than state extension services.

Producer cooperatives in Africa have generally had an unhappy history mainly because of difficulties in holding management accountable (i.e. moral hazard) to the members, leading to financial irregularities. In addition, Kherallah and Kirsten (2001) assert that one major problem with traditional cooperatives in developing countries was that members never had a major financial stake in the cooperative.

Research by Machethe (1990; 308) in the former Lebowa provides a concise explanation of the factors leading to poor performance of co-operatives, namely;

- Lack of identity with their co-operatives;
- Failure of co-operatives to involve members in policy decision making;
- Failure of co-operatives to compete with other businesses;
- Inability of members to dismiss inefficient management;
- Inability of co-operatives to keep adequate stocks of requisites.

Machethe (1990) further argues that the performance of co-operatives is dependant both on external (e.g. physical infrastructure, product pricing policies, regulatory institution) and internal (e.g. proper management) factors. However, there are two main factors that determine the success of co-operatives, namely (Machethe, 1990 and Kirsten, 1993):

- Co-operatives can only succeed if they manage to operate with lower transaction costs than their competitors;
- Success or performance of a co-operative movement depends on the benefits members derive.

There appears to be a renewed interest in a new generation of cooperatives that addresses the weaknesses of the traditional cooperative. The NIE can inform the design of such organisations and cooperatives to prevent their failure (Kherallah and Kirsten, 2001). Although the performance of agricultural cooperatives in developing countries has been marginal at best, improving a cooperative's managerial capability should greatly enhance its business performance, technology transfer to the farmers and its marketing skills. In addition, Fekete, Fenyés and Groenewald (1992) and Abbott (1993) argue that the following conditions are necessary for the success of cooperative or other group marketing;

- Availability of local leadership and management;
- Groups of farmers dependent on one or a few crops for their total income;
- An educated membership or educational work among members;
- Members having similar basic backgrounds;
- Concentration upon and homogeneity of farm production for the market;
- Uniform services and uniform prices to members;

- Avoidance of political links as well as maintenance of political and religious neutrality;
- The co-operative must be established as a result of a recognised need in the community;
- Starting with at least one activity and continuity without being heavily subsidised.

Many co-operatives have deviated substantially from some of these principles. For instance, the establishment and the subsequent operation of the South African co-operative movement was governed by the Co-operative Act and regulations (Regulation R117). The South African government played an important role in the establishment of the co-operative movement as an initiator, legislator, controller and financier. Thus government played a leading role in the establishment etc. with little or no community involvement that lead to lack of ownership and loyalty. As a result farmers generally regarded co-operatives as government businesses (Kirsten, 1993). Fekete *et al* (1992: 19) argue that “government control and interference should be minimal and it should be the government’s task to promote, not to control development including development of co-operatives”

Kirsten (1993) argues that the failure of co-operatives were exacerbated by the fact that they were often established as an instrument to combat unemployment and provide power to those disempowered by the apartheid and capitalist regime. Thus, the crux of the co-operatives problem was that they were often started for social and sometimes political rather than business reasons. A factor complicating the operation of the co-operative movement is that the objective functions for the co-operatives are often difficult to specify or even perceptualise (Fekete *et al*, 1992). According to Machethe (1990), co-operatives should be established in order to serve the interests of members and it is only when the majority of members are satisfied that co-operatives can be said to be successful. Thus the success of co-operatives is determined by the extent to which it enables members to realise their objective function or expectations. Responses vary in research conducted by Machethe (1990: 306) on reasons for joining the co-operative

movement. Some of the major reasons for affiliation mentioned by the respondents were the following;

- Buying goods on credit;
- Sell produce through co-operative;
- For financial benefits;
- Buy goods cheaper;
- It was compulsory.

From the above, it is evident that the objective function for the members of a co-operative varies considerably and thus it is often difficult to ascertain whose interest is to be optimised. As a result, some authors prefer to analyse co-operative behaviour as the process of consultation and bargaining rather than the optimisation of a single attribute (Fekete *et al*, 1992)

As mentioned above, a new generation of cooperatives known as, bargaining co-operatives has emerged recently in developed countries such as United States. Bargaining cooperatives do not generally handle growers' crops or provide processing services. Their primary function is to contract with processors for the sale of members' crops (Pasour, 1998). There are two kinds of agreement involved in a bargaining cooperative, one being a membership agreement between growers and the cooperative, the other is a marketing agreement negotiated with processors. If proved successful, the development of bargaining cooperative in the developing countries could enhance small-scale farmer participation into the market economy. Moreover, as concerns about farmers' lack of bargaining power increase, agricultural cooperatives, though not a panacea, may assume a prominent role in the production and marketing of agricultural products.

2.4.2 Contract Farming and Vertical Integration

Agricultural markets have developed in such a way that well developed supply chains and networks are now an absolute necessity to satisfy the needs of the consumers for fresh, high quality and safe products. In this age of market liberalisation and globalisation, many product markets are concerned mainly with

both quality and safety of the product they sell, to the extent of specifying the inputs that the farmers have to use for their products. As a result, agriculture is undergoing a process of vertical integration with allied industries and, as argued by Rehber (1998), the control of agriculture may in the future consequently not rest within the industry itself. There are two types of vertical integration – ownership integration and contract production which is commonly known as CF. Presently contract production in farming is more common than ownership integration and many authors regard CF as a vehicle for modernisation which is likely to remain an important – indeed growing – feature of rural Africa for the foreseeable future. (Glover, 1984; Grosh, 1994; Porter and Phillips-Howard, 1997; Pasour, 1998 and Reynolds, 2002).

Arriving at a meaningful definition of contract is rather difficult. One classic definition provided by many authors (Minot, 1986; Rehber, 1998 and FAO, 2001) refers to contractual agreements between farmers and processing firms, whether oral or written, specifying one or more conditions of production and/or marketing of agricultural products. A standard farming contract regulates in advance price, production practices, product quality and credit facilities. The intensity of the contractual agreements varies according to the depth and complexity of the following provisions, namely market provisions, resource provisions and management specification. There is a great variation in the contract provision, the size of the farm contracted, the type of technical assistance and services provided to growers, and the bargaining relationship between the buyer and the growers. According to Minot (1993), these variables depend primarily on the commodity produced and its final market, and to a lesser degree on the existing land tenure system, the policy environment and other factors.

CF tends to offer a more attractive option for processors and a viable means of facilitating smallholder integration into the market economy. For smallholder producers, CF offers access to reliable and guaranteed markets, it reduces risk and most importantly, it provides substantial access to inputs and production services. Recognising the role of transaction costs in agriculture is important in understanding why farmers may choose to contract. There is potentially a significant cost associated with monitoring markets for price movements,

searching for buyers for their product etc. Other things being equal, these added costs may induce producers to contract in order to economise on transaction costs and allocate more time to production decisions. The key point is that CF, *inter alia*, tends to be successful where it succeeds in reducing farm level transaction costs for adjustment to a viable commercial opportunity (Delgado and Siamwalla, 1997).

For processing companies (sponsors), the main potential advantages are that contract production is more reliable than open market purchases and the sponsoring company faces less risk by not being responsible for production, and CF provides the company indirect access to land. More importantly, more consistent quality can be obtained than if purchases were made on the open market.

CF, on the other hand, cannot be considered a panacea for integrating small farmers to the market economy. CF creates its own risk despite reducing others. It has been plagued by many problems in the past such as producers' failure to produce to contract standards resulting in a loss of contracts' premium prices, inability to enforce contracts with farmers, and unequal negotiation and bargaining powers between powerful agri-business and rather weaker farmers (Grosh, 1994; Rehber, 1998 and FAO, 2001). By far the most common problem cited in the literature is the manipulation of quality standards (Glover, 1987). This opportunistic behaviour occurs if an unusually large crop is produced which exceeds the processor's requirements; the processing firm may raise its quality standards in order to reject what it does not want. The processing firm may raise quality standards not only to control volume but to get a portion of the crop at a very low price. This possibility of exploitation usually exists when an unorganised mass of smallholders face a monopsonist.

Other risks include the non-renewal or termination of contracts (or even threats of non-renewal or termination) as well as introduction of unsuitable technologies and crop incompatibility. In addition, the farmer loses his independence to some extent varying with contract conditions. That means, the farmer's management function is transferred to another person. Similarly, there is a danger that some contractual arrangements may lead to the farmer being little more than a labourer on his/her

own land. Closely related to this is a scenario where independent farmers are replaced by contract growers who simply carry-out processors' orders and when this happens valuable skills may be lost to future generations as well as the present generation. These factors could contribute to the danger that smallholders might be excluded from contracting arrangements.

Since contracting firms do not own land themselves, they will likely have no interest in good and environmental friendly farming practices such as soil conservation. For this reason Glover (1987) argues that they will indirectly mine the land of their producers by imposing farming practices that produce high yield in the short run with serious consequences such as, for example, exhausting the soil in the long run. Once this occurs the company can simply enlist new growers or move on to another virgin area. Whether or not such a pattern actually occurs depends largely on how much information growers have about the effects of the recommended practices and also on whether the growers really have alternatives.

Contracting is fundamentally a way of allocating the distribution of risk between the firms and its growers. However, while contracts may reduce risk for some farmers, these risks may be transferred to non-contracting producers. Non- contractors are likely to experience greater instability since they would be restricted to the "thin" peripheral market not covered by contracts.

Finally, the other potential problem associated with CF is the application of unsuitable technology and crop incompatibility. The introduction of especially new crops to be grown under conditions rigorously controlled by the processing firm can cause disruptions to the existing farming system. For example, harvesting of the contracted crop may coincide with the harvesting of food crops, thus causing competition for scarce labour resources. Two factors need to be considered before the introduction of innovations to any agricultural environment (FAO, 2001);

- Possible adverse effects on the social life of the community
- The practicality of introducing innovations or adaptations. The introduction of sophisticated technology may result in social ills such as loss of local employment.

Furthermore, the results of research by Maloa and Nkosi (1993) and FAO (2001) offer some suggestions for consideration in forming policy for agricultural development through contract agents, namely;

- Provision of appropriate technology. Technology is a good investment only when the recipients actually receive the tangible benefits it promises.
- Provide basic and reliable infrastructure. A major pre-condition for agricultural investment in rural areas is the existence of an adequate communication system that includes roads, transport, telephones etc.
- Subsidise marketing information and training of farmers. Farmers tend to be rational decision makers when provided with useful and relevant information at the right time.
- Incorporate other crop regimes. Farmers must be allowed a wide choice to exploit their varied potential.
- Convene regular meetings with farmers. Problems emanating from contractual farming agreements can actually be minimised by efficient management that consults frequently with farmers.
- Announce policy changes widely. Policy changes should be announced as early as possible to all those likely to be affected.

With all the above in mind, it is important for both producers and processors to have a collaboration consciousness. It should be emphasized that both sides need each other in order to make a contractual relationship that operates for their mutual benefits. Otherwise, the cooperation brought by CF would always be a source of disputes and dissatisfaction. It is worth noting that contractual agreements are of different intensity and as such problems experienced vary from one contract to the other.

2.5 Issues and Theory of Commercialisation

Smallholder agriculture is simply too important to employment, human welfare and political stability in less developed countries and therefore cannot be treated as just another small sector of the economy (Delgado, 1999). To fully realise its developmental potential, literature emphasises the need for smallholders in Africa

to become increasingly involved in the production for sale of high value crops. The previous section introduced the framework and two models under which commercialisation can be practiced and analysed. This section highlights the pros and cons of commercialisation to the rural households. More important it begins by providing a definitional aspect of agricultural commercialisation followed by impact of agricultural commercialisation on households.

2.5.1 Agricultural Commercialisation Defined

Agricultural commercialisation means more than the marketing of agricultural output (Von Braun, Bouis and Kennedy, 1994; Von Braun, 1995; Pingali and Rosegrant, 1995): it means that product choice and input use decisions are based on the principles of profit maximisation. Thus, commercialisation can occur on the output side of production with increased market surpluses, but it can also occur on the input side with increased use of purchased inputs. Commercialisation of agricultural systems leads to greater market orientation of farm production; progressive substitution out of non-traded inputs in favour of purchased inputs and the gradual decline of integrated farming systems and their replacement by specialised enterprises for crops, livestock, poultry and aquaculture products. It is important to note that commercialisation is not restricted to cash crops; the so-called traditional crops are frequently marketed to a considerable extent (Von Braun, 1995).

This study refers to commercialisation from the output side of production perspective. Govereh and Jayne (1999: 2) refer to agricultural commercialisation as the proportion of agricultural production that is marketed. As such, it can be measured along a continuum from zero (total subsistence oriented production) to unity (100%) of production sold. Thus agricultural commercialisation involves a transition from subsistence oriented to increasingly marketed oriented patterns. A fully commercialised farm may however still produce intermediate inputs, e.g. cotton hay for livestock.

The concept of agricultural commercialisation is closely related to agricultural modernisation. On a *priori* expectation the two concepts are positively related. In

his book, *To create a modern agriculture*, Mosher (1971) argues that there are two conditions necessary for participation in modern agriculture. Firstly, either each farm moves towards the commercial end of the continuum or that farmers who produce only or primarily for home consumption have some off-farm employment that produces cash income out of which farm inputs can be financed. Thus in modern agriculture both commercial and subsistence agriculture are not mutually exclusive, but the former seems to be the more likely route.

2.5.2 Rationale for commercialisation

This section draws heavily from a comprehensive empirical study done by Von Braun *et al* (1994) in developing countries including, among others, Gambia, Guatemala, Kenya, the Phillipines and Rwanda. The rationale for commercialisation lies heavily on its potential to increase rural economic growth and poverty alleviation.

2.5.2.1 Employment effects

Von Braun *et al* (1994) argue that agricultural commercialisation affects the level of employment. Changes may take place in the use of hired labour versus family labour and in the distribution of family labour by gender, as well as the level of labour input for field operations and for processing. Research by Von Braun *et al* (1994) on commercialisation schemes found large expansions in the use of hired labour in all the studies. This indicated a form of commercialisation of the labour market in the rural economy. In general, women work less on the more commercialised crops than do men or hired labourers. Women generally work much more on the subsistence crops than on the commercialised crops (Von Braun *et al*, 1994). It is therefore expected that favourable wage rate effects from increased employment would spread the benefits of the increased labour demand in agriculture across a broad spectrum of the rural economy. While these general equilibrium effects may be true, the gender distributional effect of commercialisation needs further investigation.

In addition, agricultural commercialisation through CF has influenced labour markets in many regions of Africa (e.g. Kenya, Malawi) and some contracted

schemes have encouraged high rates of in-migration to certain countries on a seasonal or long-term basis (Little, 1994). In some cases, the projects have also appeared attractive enough to dissuade rural labourers from migrating to urban areas in search of employment. Thus agricultural commercialisation plays a distributional role, both regionally, nationally and internationally, and to a certain extent this reduces the developmental imbalances between and within regions etc.

However, Von Braun (1995) acknowledges that the employment effects for the poor resulting from commercialisation are very crop specific and such effects are a function of the labour market and the technologies introduced. Thus, the choice of the crop and the technology has a major influence on the actual and outcome of the employment effects. Program and policy decisions in this regard can go a long way to maximise the employment benefit for the poor through backward and forward linkages

2.5.2.2 Income Effects

Von Braun (1995) argues that the large body of literature claiming that agricultural commercialisation has negative effects on the welfare of the poor was mostly conceptually flawed and utilised potentially biased samples. With few exceptions, a study by Pingali and Rosegrant (1995) in some developing countries found that commercialisation of agriculture benefits the poor by offering direct income benefits. These changes result from a combination of increased productivity and increased cash sales. A study by Little (1994) in some African countries reveals that CF increased incomes from a moderate (30-40%) to a high (50-60%) proportion of participants. Other studies show similar results (Von Braun, 1995 and Glover, 1987). The direct income effects are further complemented by indirect income effects through forward and backward linkages that are generated by the increased demand for inputs for commercialised agriculture and use of some of the farmers' increased income to buy consumer goods locally. Similarly, the income effect from commercialisation is not restricted to the commercialising schemes and can spread their benefits across regions. In almost all the African case studies conducted by Von Braun (1995), total per capita income was found, *ceteris paribus*, to be higher among the participants.

2.5.2.3 Nutritional and Health Effects

Closely related to the preceding discussion is the phenomenon that increased household income permits households to respond in a number of ways that may favour nutritional improvements (Von Braun, 1995). The income mediated effect on health (nutrition) operates through two main pathways (Kennedy, 1994). First, increased incomes can be used to purchase either a different mix of goods and services e.g. more access to health care, better housing etc. Second, income food consumption linkages, by improving an individual household member's energy or other nutrient intake could improve nutritional status, which in turn could improve health. In addition reduced malnutrition as a result of improved nutritional status has a potential effect of reducing malnutrition-induced mental retardation particularly amongst infants (Wilson and Ramphela, 1989). These benefits are most likely to be realised when farmers' income, especially that of women producers are raised; nutritional status and food security are likely to improve if additional foods can be purchased.

However, Binswanger and Von Braun (1991) add a word of caution to this debate of benefits attributed to commercialisation of agriculture. The premise that the poor are often better-off in commercial regions is not sufficient to establish a causal link between commercialisation and poverty, either in improving or worsening the lot of the poor. A superior agroclimatic endowment rather than commercial production could account for the greater wealth of the commercialised regions.

2.5.2.4 Food security: Synergies between Cash and Food Crops

Considerable controversy surrounds the issue of whether agricultural commercialisation contributes positively or negatively to food security among commercial smallholder farmers. Govereh and Jayne (1999) argue that there is a relatively neglected avenue of research that concerns the effect that cash cropping can have on the production and productivity of other household activities, including food crop cultivation. These authors advance two potential pathways by which cash cropping may affect the productivity of other crops, namely, household level synergies. This occurs when the household's participation in a commercialised

crop scheme enables it to acquire resources not otherwise available for use on other enterprises in the crop mix. Secondly, regional spillover effects occur when a commercialising scheme may attract certain kinds of investments. Examples of these household level and regional level spillover effects include the following (Govereh and Jayne, 1999: 3):

- Credit failure and lack of other financial services is a widespread and general problem in developing countries. Under credit and market failures, commercialisation schemes may be one of the few feasible ways to acquire credit and inputs. In some cases, through interlinked transactions for inputs, credit, management, and sale of products, the institutional mechanisms between farmers and marketing firms can relieve some of the market failure problems. Strassberg (1997), found, for example, that participation in cotton outgrower schemes in Northern Mozambique was the primary means of acquiring cash inputs for use on food production.
- Commercialisation may support private investment in infrastructure and human capital that has broader benefits for other economic activities such as food crop production. In Zimbabwe, for example, an extensive cotton training program provided by both the government and the private companies created knowledge that does not only improve cotton management skills but improves the overall quality of farm husbandry.
- The promotion of high-value, high returns enterprises may improve households' ability to invest in lumpy assets such as animal traction. In Mali, for example, 70% of the farmers surveyed by Dione (1989) perceived cotton production and usage of fertiliser as the two most important conditions determining the profitability of animal traction adoption.
- Input-intensive cash crops, by promoting market demand for inputs, may induce private sector investment that improves the availability of key inputs that can be used on a wide range of crops. The introduction of cotton to Southern Mali increased the demand for fertiliser which subsequently stimulated private investment from input manufacturers, distributors and retailers, who decentralised their service into major producing areas.

2.5.3 Negative Impacts of Commercialisation on the Poor

A number of concerns have been raised over possibly adverse consequences of the transformation of agriculture through the process of commercialisation. Some of these concerns are discussed below.

2.5.3.1 Food insecurity

One of the long-standing criticisms of agricultural commercialisation has been that the amount of food available for home consumption is drastically reduced when households become cash producers (Kennedy, 1998). Conditions under which the poor are likely to lose occur when the production of staple food for local consumption is displaced by non food cash crops. The adoption of cash crops may therefore raise food prices. But this is likely to be offset by increases in income from the commercialised crop. But if income gains resulting from the switch are not locally accrued by the poor, the poor may lose to the extent that they are net purchasers of food.

The unintended effects of green revolution on food production in Asia, for example, are closely related to the above. The green revolution, which many regard as the principal cause of increased production, is alleged to have aggravated poverty in certain regions. Green revolution introduced, *inter alia*, new high yielding varieties and heavy ploughs which were an early favourite but the latter was abandoned when it was realised that their contribution was to increase chances of soil erosion, a major threat to food security (Baker, 1984). New high yielding varieties on the other hand delivered better yields but also took more out of the soil and demanded intense irrigation thereby causing water scarcity. This aggravated poverty in certain parts of Asia (e.g. India).

Other criticism levelled against the green revolution has been on equity and distributional issues. According to Bradnock (1984), early in 1970s a number of analyses of the impact of the green revolution in different countries, especially in rural Asia, concluded that the benefits of the new technology were being

monopolised by rich and middle farmers to the relative exclusion of small cultivators.

2.5.3.2 Asset Specificity

The other way in which commercialisation can impact negatively on the poor is what Binswanger and Von Braun (1991) term “the trap of committed expenses”. Asset specificity refers to the degree to which a particular asset is fixed in a particular mode of production. A classic example is that of a cotton harvester. Committing capital to some long-term and highly specialised investment such as a cotton harvester reduces the capacity to adjust to technological breakdown, price risk or disruption of markets. When returns to capital do not materialise, the fixed capital resource cannot be switched to new productive tasks. These risks are highest for the poor, but empirical evidence shows that the poor rarely specialise completely (Binswanger and Von Braun, 1991; Von Braun, 1995 and Foster, 1998).

One other type of risk among those of committed expenses arises when a commercialised project attracts households to migrate to a new area and then the project collapses. For example, the collapse of a rice irrigation project in Gambia led to disinvestments in housing etc. and even increased divorce rates (Von Braun, 1994).

2.5.3.3 Implications for Women and Children

Agricultural commercialisation and new production technology can have profound implications for the control of resources and division of labour in rural households. Raynolds (2002) argues that the growth of commercialisation particularly through CF is likely to stimulate struggles over labour, property and customary household reciprocities and obligations. In most contracts men are assumed to be the growers and heads of the households by the contracting company. As a result, men sign the contract, draw on their childrens’ and wives’ labour and consequently receive the payments. A study by Porter and Phillips-Howard (1997) on the evaluation of CF schemes in South Africa and Africa in general found that on the North Pondoland sugar scheme the registration of contracts was around 70 males

per 30 females, but women were the principal farmers on at least 70% of the plots. Moreover, women frequently work all year on the cane plots, yet their husbands go to the mill to collect the cane cheques at harvest and retain control of the funds. In cultures where men and women have separate spending responsibilities, such as in much of Africa, such payment to men may bias household purchases away from food and health related items (Minot, 1986). In this context it is important to quote the following response from a Dominican Republic woman whose household participated in a tomato commercialisation scheme:

“My husband spent all the money from the tomatoes last year on drinks (alcohol). I was very upset because I worked in the parcel from the day of planting. I did not even get paid for the tomatoes I harvested. I put myself out working in that crop and I did not eat even one meal that came from it. None of the money came here to the household” (Raynolds, 2002: 792).

Although this may not be a general phenomenon, it is evident that greater incomes from agricultural commercialisation are not always translated into improvement in standard of living broadly defined to include nutrition, education and health. However, it should be noted that this problem can occur with any income-generating project and is not a problem unique to agricultural commercialisation.

The Guatemalan commercialisation experience impacted negatively on child welfare. The expanded employment increased seasonal use of child labour to such an extent that local communities became concerned about school participation and changed school schedules and the timing of vacations. This was after children started being absent from school and this probably impacted negatively on their school performance. As the South African Government is committed to promoting women’s and children’s rights, what still remains to be seen is how these initiatives will impact on the gender relations at the household level as more women contest their present situation.

2.5.2 The Commercialisation Pathway: Implications for Public Policy

Before providing an overview and synthesis of issues in the commercialisation process, it is important to consider the work done by Foster (1998) focusing, *inter*

alia, on the definitions of subsistence, commercialising and commercial farmers. He defines these concepts in terms of the continuum that in turn reveals how commercialisation occurs. Such a continuum is shown below.

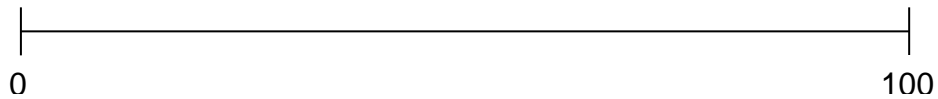


Figure 2.1: Commercialisation Pathway (Foster, 1998: 246).

A farmer can be at any point on this continuum. Note that farmers moving to the right on the continuum devote an increasing proportion of their production resources towards production for the market. Pingali and Rosegrant (1995) argue that countries such as South Africa and much of those in Sub-Saharan Africa are at the lower end of the continuum or commercial pathway.

It is crucial for policy makers, innovators etc. to understand the complex changes that agricultural commercialisation brings to the farmers, their farming activities and also to their social activities and family life. Most importantly, agricultural commercialisation involves changes from the closed ended goal of the subsistence farmer to the open ended and virtually insatiable economic goal (profit maximisation) of the commercial farmer. This new goal brings with it a change in the types of management decisions and in the information needed to make decisions. For instance, associated with new involvement in the market is a group of new risks. These new risks along the commercialising continuum require new understanding of the nature of the risk, new types of information and new coping strategies (Foster, 1998).

Agricultural transformation and agricultural diversification is closely related to agricultural commercialisation as one component of agricultural change. One very relevant concern for this study is determining how the relationship between agricultural commercialisation, agricultural transformation and agricultural diversification can be analysed at the farm level. Timmer (1997) argues that in the early stages of the agricultural transformation there is a significant diversity when most farm households produce largely for subsistence consumption. At this stage

little specialisation exists and markets for local produce are imperfect. Moreover, there are few formal mechanisms to cope with risks of crop failure that would threaten levels of food consumption. As these markets develop, as the financial sector extends risk management tools to rural areas and as incomes of farm households rise above subsistence level, farmers tend to specialise in the production of one or few crops. As a result, economies of scale are created through “learning by doing” effects. This process also results in progressive substitution of purchased inputs for non-traded inputs. Furthermore, as the level of commercial orientation increases, mixed farming systems give way to specialised production units that are designed to rapidly respond to market prices and quality inputs (Pingali and Rosegrant, 1995).

Increased specialisation and commercialisation requires that farmers learn how to cope with a risk that is of little concern to subsistence farmers: the risk of fluctuating prices while at the same time specialisation in crop production, for example, increases their risk from yield fluctuations. Mechanisms for coping with some of the risk that can emerge thus play a crucial role in understanding the commercialisation of agriculture and the governments’ role in it.

It is evident from above that agricultural commercialisation is not a smooth and a frictionless process and as such government policy has a crucial role to play in minimising the risk and smoothing out the process of commercialisation of the agricultural sector. Therefore, the identification of the policies that will speed and smoothen agricultural commercialisation as well as creation of the political environment to get policies implemented requires urgent attention to the following question: What government actions, policies, investment, regulations are needed to stimulate growth in a market oriented rural economy? In this regard, Pingali and Rosegrant (1995) advance key elements of a long-term strategy to facilitate commercialisation:

- Research and extension to generate productivity and income enhancing technologies. In addition to this productivity objective, the focus of research should be to provide farmers with the flexibility to make crop choice decisions and to move relatively freely between crops.

- Economic liberalisation, including trade and macro-economic reform and deregulation of agriculture.
- Protection against unfair foreign competition such as dumping, unequal globalisation etc. Developing countries in particular must retain the right to protect the agricultural system from instability associated with northern agricultural subsidies (Groenewald, 1998; Watkins and Von Braun, 1995).
- Development and liberalisation of rural financial markets.
- Establishment of secure rights to scarce resources. Secure property rights are critical for efficiency and agricultural growth. Secure rights to land create those incentives that farmers need to invest in land improvements which increase the long-term productivity growth which can be induced by the start of commercialisation.
- Investment in rural infrastructure and markets. Infrastructural investments play a crucial role in inducing farmers to move towards a commercial agricultural system. Emphasis for infrastructural investment should be on improving general transport, communications and market infrastructure.
- General education especially in financial matters.
- Development of appropriate financial services to small-scale farmers

In support to the general policies to facilitate commercialisation, support services can increase the benefits and reduce the probability of adverse consequences from the process. Finally, the working of some of the above policies to help the market economy work more efficiently requires the maintenance of both macroeconomic and political stability, as well as stabilizing the food economy and ensuring that food security is a minimum task of government (Timmer, 1997).

2.6 Conclusion

The integration of the traditional smallholder agriculture into the commercial agricultural economy is an essential part of a successful development strategy. In view of the acceptance of this premise, the main objective of this chapter was to offer a theoretical overview of the issues relating to the commercialisation of small-scale agriculture in developing countries. The chapter began by providing an overview of the NIE and its application to the commercialisation of small-scale

farming. The basic underlying view of this school of thought postulates that institutions are the main determinants of economic performance and that the costs of transacting are the key to the performance of economies. The two institutions cursorily discussed in the study are contract farming and farmer cooperatives, as these institutions are key to increasing market access. These two institutions have their own flaws and as such are not panaceas to solve all related problems of agricultural production and marketing systems. The two main problems levelled against CF in particular relate to contract default, enforcement and the scale of farming operations leading to high per unit transaction costs.

Agricultural commercialisation in general offers many advantages to the rural households and some of these advantages lie in its ability to create jobs for the poor, increase incomes and finally to ensure household food security. However, commercialisation of agriculture is not immune from criticism. The main criticism advanced is that in cases it causes food insecurity and has negative impacts on both women and children as they may work longer hours without reaping any meaningful rewards. Of course, these criticisms hold true under certain circumstances. It is therefore evident that commercialisation is not a frictionless process. Problems experienced through commercialisation serve to demonstrate the frequent need for intervention either by government or farmers' organisations. The policies needed for a smooth transition to commercialisation include investment in rural market, transportation and communication infrastructure to facilitate integration of the rural economy; improvement in research to increase productivity and extension services to increase flexibility. In this regard, government policies and investment in public goods is crucial for small-scale farmer development. As a concluding remark, government policies must promote and be conducive to private investment in the agribusiness environment.

CHAPTER THREE

THE SOUTH AFRICAN COTTON INDUSTRY

3.1 Introduction

Cotton is one of the most important cash crops in sub-Saharan Africa predominantly grown by small-scale farmers. It is primarily grown for its fibre as a raw input for the textile industry. It plays a vital multi-sectoral role in the economies of many developing countries by earning foreign exchange from cotton fibre and textile exports. Compared to other African countries, South Africa has one of the lowest percentages of small-scale cotton producers. The South African cotton industry currently faces a number of challenges that place the continued viability of cotton production and possibly also some aspects of downstream processing in question.

This chapter offers an account of the performance of the South African cotton industry, giving special attention to both past and current developments influencing the structure of the industry. To achieve this, the chapter is organised as follows. Section 2 begins with a brief historical background of the development of the South African cotton industry. Prior to the introduction of the Marketing of Agricultural products Act 47 of 1996, the South African agricultural sector was highly regulated and the marketing service for cotton industry was handled by the Cotton Board. Section 3 of this chapter deals with the marketing of cotton products before and after deregulation. A brief explanation of the importance of cotton is highlighted in section 4. Section 5 examines the major factors limiting cotton production in South Africa. Of major concerns in this regard are low international cotton prices as a result of the US subsidy policy. Sections 6, 7 and 8 provide a comprehensive analysis of the various key sectors making up the South African cotton industry pipeline. Section 9 highlights the latest technological development

that is a subject of controversial debate, namely the adoption of *Bt* cotton. The final section offers concluding comments

3.2 Historical Development of the South African Cotton Industry

The origin and the development of the South African cotton industry is best understood within the context of the genesis of the world cotton industry. Literature on the historical development of world cotton industry is inconclusive as nobody seems to know how long cotton has been in existence. According to Van Heerden (1988) pieces of cotton bolls and cotton cloth more than 7000 years old, have been found in a Mexican cave. Archaeological findings indicate that cotton was in use in West Pakistan as early as 3000 BC. At the same time the Egyptians in the Nile Valley were already manufacturing and weaving cotton clothes (Cotton South Africa, undated). It is generally believed that the first cultivation of cotton occurred in India, though it grew wild in several locations around the world.

According to Van Heerden (1988), as early as 1516 Portuguese explorers met natives in South Africa who grew cotton and wore cotton clothing. The first cotton seeds were planted in the Western Cape more or less after the arrival of Jan Van Riebeeck. Cotton-growing spread to Amantzimtoti district in Natal after the importation of cotton seeds from America by a missionary known as Dr Adams. Due to increased demand, arising mainly as a result of the American civil war, cotton was planted on a relatively large scale in both Natal and the Cape Colony.

After 1870 world cotton production came to a stand still and in 1909 the Transvaal Department of Agriculture began to revive the South African cotton industry. As a result of the revitalisation process, cotton production increased significantly from 566 bales to 16305 bales between 1918 and 1926, but dropped gradually thereafter mainly because of a drop in price for the 1926 season's crop. At this time, the main cotton growing areas were Northern Natal and Eastern Transvaal Lowveld. In addition, cotton was grown exclusively on dryland. The first cotton cultivation under irrigation commenced in the Uppington area and according to Van Heerden (1988), this was regarded as a historic development.

The revitalisation process of the South African cotton industry also saw the establishment of an experimental station in Rustenburg in 1913. This is currently an institute of the Agricultural Research Council known as the Institute for Industrial Crops. Prior to the year 2000 this institute was known as the Tobacco and Cotton Research Institute. The main purpose for its establishment was to provide farmers with advice. In 1922, a small ginnery was erected at the experimental station and it was followed by bigger ones at Germiston and Barberton. In 1924, a ginnery was also erected in Natal while the Uppington ginnery went into production in 1953. The full name for a ginnery is a cotton seed removing machine. However, the cotton pickers in the early years of cotton cultivation in the United State of America (USA) simplified the full name to a ginnery, or even a gin (Cotton South Africa, 1998). According to the historic document of cotton South Africa, a first ginning machine was manufactured in 1793 by an American known as Eli Whitney.

While primary cotton production was taking place at the beginning of the 20th century, in South Africa there were at that stage as yet no facilities for either spinning or weaving. All cotton produced was exported either in the form of raw cotton or cotton lint. In 1946, a local spinning and weaving industry was established in Paarl (South Africa). This establishment was made by foreign investors from England after realising the potential for a lucrative business from the South African cotton industry. Unique with this initiative was that the investors owned the whole of the cotton pipeline. The greatest boost for the cotton trade in South Africa was the establishment in 1952 of the first proper textile factory in Ladysmith (KwaZulu Natal) (Van Heerden, 1988).

The establishment of the cotton ginneries at Barberton and Germiston was also accompanied by the formation of the co-operative movement. This formation was later governed by the Co-operative Societies Act 29 of 1929. According to section 102 of this act cotton was officially declared an agricultural crop in 1939 (Van Heerden, 1988). The result was that farmers could only sell their cotton to co-operatives in their own operational area.

In 1974, the cotton scheme was accepted by the then minister of agriculture and approved by the State President (Cotton Board, 1988/89). The establishment of the scheme, *inter alia*, resulted in the formation of the Cotton Board. This Board was the overall marketing body which represented the interests of the producer, the ginner, the spinner and the consumers. The board was chiefly authorised to register ginner and was also given the powers to prohibit the sale of seed cotton except at a higher price than a price fixed by the Board. At the time of its establishment, the Board had powers in respect of seed cotton only. However, on the 3 October 1975 its powers were extended accordingly including the purchase of cotton lint.

As time progressed, the authority and powers of the board were extended and some were amended to meet the challenges facing the industry at the time. Some of the remarkable and noteworthy authorities and powers extended or amended are listed here below (Cotton Board, 1994/95);

- In 1982 the Board was authorised to deal with plant material, but the Board never made use of this provision.
- At the end of August 1992, the full discretionary powers of the board with regard to the registration of ginner were amended and as such the Board was no longer allowed to decline an application for registration.
- On 13 November 1992, the power of the Board to register was extended to make provision for informal registration of producers.
- On 2 December 1994, the scheme was amended by making a provision that in the event of the discontinuance of the scheme, the assets of the Board would be vested in one or more Trusts whose main objectives would be the promotion of cotton production and consumption.
- On 3 March 1995, the power of the Board to fix a minimum price for seed cotton was deleted from the scheme. This was as a result of a failure by the Board to make use of this provision.

Furthermore, over and above the normal powers vested in the Board to execute its administrative functions the Board, with ministerial approval was also empowered to render the following services;

- To render financial assistance to any undertaking for the preserving, manufacturing, processing, storing or conditioning of seed cotton as well as research in connection with the improvement, production and marketing of seed cotton. In this regard, the Board had the powers to act as an agent for the receipt and sale of seed cotton.
- Establish an information service in order to inform producers regarding cotton marketing conditions in general.
- Advise the minister in respect of the provisions regarding grades, quality standards, methods of packing and the marketing of seed cotton
- Impose a levy and a special levy on cotton lint.
- Request any person to furnish information relating to cotton
- The Board could also with the approval of the minister prohibit the sale of certain classes, grades and quantities of seed cotton.
- The Board could appoint inspectors for the purpose of monitoring the adherence to the cotton scheme and decisions taken thereunder.
- The board was empowered to register all the ginnerers in South Africa. Under this provision, no ginner was allowed to deal with seed cotton in the course of trade in South Africa, unless he was registered with the Board.

Following the deregulation of the South African agriculture in terms of the Marketing of Agriculture Products Act, 1996, all role players in the cotton industry decided to form a company incorporated under section 21 of the Companies Act, 1973 and this company is known as Cotton South Africa. The main objective of Cotton South Africa is to “ further the establishment of an international competitive local industry and to create and maintain an environment in which the Southern African cotton industry can develop, in order to deliver an important contribution to the development of the country” (Cotton South Africa, 2001/02). Parallel to its main objective, Cotton South Africa is also mandated to perform the following essential services that are important to all the role players in the cotton industry, namely;

- Rendering of information services to all role players
- Promotion of cotton production and usage
- The maintenance of quality standards and norms
- The co-ordination of research and the provision of training

- The facilitation of the development of the small-scale cotton farming sector
- To act as the representative industry forum

These activities are funded mainly by way of a statutory levy imposed on all cotton lint produced by South African ginners.

3.3 Marketing of Cotton Products in South Africa

This section outlines the marketing of cotton in South Africa before and after the deregulation of South African agriculture. Although the process of deregulation began sometime before the first democratic election in 1994, this section refers to marketing of cotton before deregulation as pre-1996 and after deregulation as post-1996 period. The reason is that the deregulation of the South African agriculture was accelerated with the introduction of the Marketing of Agricultural Products Act no 47 of 1996.

3.3.1 Pre-1996 Cotton Marketing

Historically, the cotton industry in the Republic of South Africa (RSA) developed to such an extent that it was being administered on a consensus basis. Unlike with other schemes, the cotton scheme and its implementation thereof had not been modelled to conform with the needs of the industry. With the consensus idea in mind, various sectors in the industry came to an agreement in 1975, with regard to the rules according to which cotton lint would be marketed in the RSA. The agreement was known as the Cotton Marketing Agreement. The signatories to the agreement were the ginners, spinners and the Cotton Board on behalf of the cotton producers. The Cotton Marketing Agreement also provided for the establishment of a controlling body namely the cotton marketing committee. The chief responsibility of this committee was to oversee the regulatory measures and to take decisions regarding the marketing arrangement.

In terms of the arrangement, the signatories annually agreed upon the quantity of cotton that the spinners would take up and ginners would supply during a specific marketing year. The take up commitments of each spinner and the manner of take up were determined by the Cotton Board in consultation with South African Cotton

and Textile Manufacturers' Association (SACTMA) and the Department of Trade and Industry. In practice, however, the allocations were determined by the Board. The take up was usually based on spinners consumption figures for the previous marketing year, with an understanding that such a spinner would not be obliged to take up more than 80% of his previous year's total consumption. Spinners were expected to take up their allocations in evenly monthly quantities, irrespective of availability of specific grades (Classen, 2003a).

The cotton supply allocations amongst ginneries were determined by the Cotton Board and were based on cotton received by ginneries. Unlike with spinners, ginneries' allocations of take up was not expected to be evenly distributed. The supply allocations were arranged in the following fashion;

- The first supply allocation in each marketing year was based on the percentage of seed cotton received by every individual ginner during the previous marketing year.
- The second/ or third delivery allocation was thereafter based on the actual quantities seed cotton received during the marketing year concerned.

Under the agreement, no ginner was allowed to carry over seed cotton and /or cotton lint from one marketing year to the next without written authorisation from the committee. Any surplus cotton lint could be offered to the Cotton Board at the same price and conditions as were in force between spinners and ginneries for the purchase and sale of cotton lint. Seed cotton used to be delivered by producers to one of the ginning companies in the country where it was ginned. Thereafter the lint was sold to spinners and the cotton seed to oil processors and farm feed manufacturers. There were two types of the ginneries which still exist even today, namely co-operative and non-cooperative ginneries (commercial ginneries). With the decline in seed cotton production in South Africa over the past decade, the number of participants in the ginning industry and the number of gins operated by them has dropped. Of the 6 members in the late 1980's only three, Clark Cotton, NSK and Oranje now remain, joined by a new entrant, Limpopo Cotton in the late 1990's (Cotton Board, 1990/91 and de Klerk, 2002).

Fixed cotton lint prices for the next marketing season were decided upon during the annual price negotiations by the cotton marketing committee. The fixed lint prices were based on the Cotlook A index. Maximum and minimum cotton lint prices were determined instead of the single fixed lint prices of later seasons. Seed cotton prices payable to growers were derived from fixed cotton lint prices. The Cotton Board monitored cotton orders and deliveries and also acted as arbitrator in case of disputes (Bruwer, 2003).

The export of seed cotton, cotton lint and cotton seed were guided by proclamation R.30 and R.31 of 03 March 1978 (Cotton Board, 1992/93). According to this proclamation, the export of cotton products was prohibited except under authority of a permit issued by the Director General of Agriculture. The minister could, however, after consultation with the National Agricultural Marketing Council and Cotton Board, determine a certain quantity to be exported during a certain period. There was no restriction on the importation of cotton, but a duty of R1.60/kg has been in force since 1992. Due to the fact that the RSA is as a rule not in a position to satisfy the local demand for cotton from domestic production a rebate of 100% of the duty was allowed on cotton lint imports from Southern African Development Community (SADC) by way of a permit system administered by the Department of Agriculture.

3.3.2 Post -1996 Cotton marketing

Currently, South African cotton marketing is based on free market principles as entrenched in the Marketing of Agricultural Products Act 47 of 1996. Under this system there is not any “intervention” or “restriction” on the buying and selling of cotton products and prices are determined by the market. South African cotton farmers market their cotton in one of the following ways;

- The seed cotton is sold by the grower to a ginner who gins the cotton and sells cotton lint for his own account to spinners, either directly or by making use of agents.
- Beginning to emerge is contract ginning, a situation where the grower does not sell his seed cotton to the ginner but contracts the ginner to gin it on his behalf on payment of a ginning fee. The cotton remains the property of the

producer who then either markets it himself or contracts the gin or someone else to market the cotton on his behalf. Some growers own their own gins (Bruwer, 2003).

Marketing of cotton under the current dispensation does not differ much from the previous marketing arrangement before the inception of the Marketing of Agricultural Products Act 47 of 1996. Cotton is still marketed on a consensus basis. Representatives of producers, ginner and spinners currently meet on an annual basis before the onset of the new season to draw up an informal voluntary marketing agreement with a view to determine the domestic shortfall for the next season which may qualify for import rebate permits. The Director General of the Department of Agriculture only considers issuing permits if all of the above parties agree to the quantity of imported cotton lint which may qualify for these permits. In exchange for growers' support, spinners jointly commit to take up an agreed upon percentage of the local crop. In this informal agreement, matters such as the take up period of the local crop, the basis of allocation of import rebate permits etc are also addressed.

There is no restriction on the importation of cotton. However, a duty on imported cotton lint from outside SADC of R1.60/kg has been in force since 1992 as previously explained. The free trade agreement between countries within SADC that has been in force since 2000 will see the RSA duty on cotton imports from SADC scaled down to zero in equal instalments within 5 years from implementation. The duty applicable to SADC countries of R0.60/kg, effective from January 2002, had been further reduced with effect from January 2003 and was completely phased out in January 2004. As a result a large part of cotton processed in South Africa is sourced from Zimbabwe or Zambia, often at a lower per unit cost. South African producers, particularly the smaller growers, feel especially threatened by changes in the regional trade regime. South African producers understandably are seeking relief, in the first instance from the tariff rebates on cotton imported from SADC counterparts.

3.4 Economic Importance of Cotton in Developing Countries

Cotton is a vital cash crop in most developing countries. It is primarily grown for its fibre as raw input for the textile industry, but the cotton seed is also a major source of vegetable oil and cotton seed cake. It provides income for spending on, for example, health and education to the purchase of tools. In addition, being one of the most important cash crops it contributes to food security and improved life expectancy in rural areas of developing countries (Bruwer, 2003). Due to current low cotton prices there is a widespread fear that health and education will become unaffordable, that children will drop out of school, and that households will be unable to respond to the threat of diseases such as malaria (Oxfam, 2002).

Oxfam (2002) estimates that around one billion people in developing countries are thought to be directly or indirectly involved in cotton production and marketing. For these people, the state of the world's cotton economy has a critical bearing on nutrition and other household necessities. One study carried out by the World Health Organisation in sub-Saharan Africa found that households growing cotton and maize had better nutrition and higher income than households growing maize only (Oxfam, 2002). Thus, the falling world cotton prices mean that farmers will have less to spend on health, education etc. Prospects for economic growth, a key requirement for poverty reduction, have also been damaged.

It is also a vital source of foreign exchange, investment and economic growth for some of the world poorest countries. Thirty-five of the 53 countries in Africa produce cotton while 32 of these countries are exporters of cotton. Based on value, raw cotton exports ranks 3rd in exports of agricultural products from Africa, after cocoa and coffee (Bruwer 2003). It accounts for 8% of agricultural exports and slightly more than 1% of the continent's total exports. Bruwer (2003) argues that cotton production currently accounts for only 1% of agricultural Gross Domestic Product; he further argues that its potential is 4 times or more. This potential can only be realised if the productivity and the potential existing in small-scale agriculture can be fully exploited.

Cotton also plays an important role in job creation. It is estimated that it provides employment for one billion people in agriculture and relating processing and textile sub-sectors (Bruwer, 2003). Except for tobacco, Cotton South Africa (undated) argues that cotton is the most labour intensive field crop to grow. It is estimated that 1.25 job opportunities are created for every hectare of cotton planted. In the record crop year (1987/88) when more than 200 000 hectares were planted in South Africa, nearly 250 000 labourers (seasonal and permanent) were employed at farm level against the foreseen 25 600 labourers. The employment potential of the cotton sector is greater taking into account both forward and backward linkages and externalities. What still remains to be seen is the employment responsiveness of the cotton industry to farmworkers' minimum wage legislation as entrenched under the Basic Conditions of Employment Act 75 of 1997.

Finally, cotton is a good source of animal feed. Cotton hay is a palatable and highly nutritious feed with high protein content. Moreover, the part of cotton seed that is left over after all the oil has been extracted (hulls) is used to make cattle feed and fertiliser.

3.5 Major Factors Limiting Cotton Production in South Africa

It is evident from the above analysis that cotton plays a vital multi-sectoral role in the economies of many developing countries. Bruwer (2003) argues that the contribution of cotton to agricultural gross domestic product can be 4 times or more higher than the 1% it currently contributes, if only major factors inhibiting the growth and development of the industry can be alleviated. Understanding of the constraints facing the cotton industry helps one to understand the performance and the status of the South African cotton industry. Major limiting factors are discussed below:

3.5.1 Low International Prices and High Production Costs

South Africa is among the minority of countries that do not offer any significant subsidies to their farmers. Eighty percent of cotton producing countries offer some form of government support (subsidies) to their cotton farmers. The USA is by far the largest country offering subsidies to its farmers. According to Oxfam (2002),

the world cotton is in crisis, but one problem that figures prominently is the heavy use of subsidies by USA. As Ken Cook, president of the Environmental Working Group, puts it “*there is no other American crop that causes more chaos and misery around the world than highly subsidised US cotton*” (South African Institute of International Affairs, 2003:2).

In 2001/02 cotton subsidies to American farmers amounted to \$3.9bn and this has been the single biggest force driving down world prices (Oxfam, 2002). The value of this subsidy is 130% higher than the market value of the American cotton. In addition, this value exceeds the entire gross domestic product of countries such as Burkina Faso and Mali, where cotton is the mainstay for millions of people. These subsidies create a huge disadvantage for resource poor African farmers. In South Africa this is evident as, *inter alia*, shown by a decline in hectares devoted to cotton production. Thus a downward trend in the cotton price would mean that commercial farmers in particular would scale down some of their cotton operations and increase other rewarding operations.

Through the subsidies it provides, the US government is driving down household income of cotton farmers in Africa and elsewhere. What makes the overall level of subsidies so important for world markets is that such a large share of domestic production is exported. Any reduction in American exports resulting from the withdrawal of government would be expected to raise world market prices, stimulating a supply response in other cotton producing countries. Research by Oxfam (2002) estimated the impact of US subsidies on export earnings for some sub-Saharan African countries (See Table 3.1)

Table 3.1 Foreign Exchange Losses as a result of US Cotton Subsidies in selected Countries in sub-Saharan Africa (2001/02, \$m)

Country	Actual cotton export earnings	Export earnings with the withdrawal of subsidies	Value lost as a result of US subsidies
South Africa	17	21	4
Zimbabwe	69	87	18
Zambia	29	37	8
Malawi	6	8	2
Mozambique	23	29	6
Uganda	18	23	5
Mali	161	204	43
Burkina Faso	105	133	28
Tanzania	79	100	21

Source: Oxfarm, 2002: 31

What is more worrying for South Africa is the question of price uncertainty of cotton. The producer price for cotton is derived from the Cotlook A index. This is an index widely accepted as the indicator of international prices. Ideally, this index is intended to be representative of the level of offering prices on the international raw cotton market (Bruwer, 2003). Instead, it is an average of the cheapest 5 quotations from a selection of the principal upland cotton traded internationally. In most cases the lowest prices are determined by producers from heavily subsidised countries such as USA, China etc. However, although the A index is generally accepted as an indicator of world prices, it is not a true reflection of the world supply and demand situation because of distortions in the world market.

The crisis of the South African cotton industry is exacerbated by increasingly high production/input costs. Production/input costs vary between dryland and irrigated cotton, but the common main contributors to high input cost are picking cost, agricultural chemicals and diesel. Other main input costs in irrigated cotton are insurance and electricity costs. According to Marketing and Planning Consulting Services (MPCS) (1998) these costs components account for close to 75% of total

input costs and therefore play an important role in the profitability of cotton growing. Important to note is that these are costs over which the farmer has little control. Thus, yield is a critical element in the profit equation. For the period 1993/94 to 1997/98 input costs increased by 86%. For the foreseeable future input costs are expected to increase taking into consideration uncertainty in exchange rates and the resultant higher price risk (both input and product prices, as well as the introduction of farmworkers' minimum wage legislation. Clearly, the cotton growing community will find it increasingly more difficult to absorb cost increases without concurrent seed cotton price improvement, or some government intervention/support in particular for dryland cotton cultivators.

3.5.2 Agronomic Constraints

The most commonly found agronomic constraints are insect pests, diseases, weeds, excessive rain, drought and soil quality. Although the prevalence of these constraints varies from one region to the other, insect pests form the largest problem experienced in cotton production (Cotton South Africa, 2000). Figure 3.1 below shows the most important agronomic constraints as identified in Makhathini Flats by Ismael, Beyers, Thirtle and Piesse (2001)

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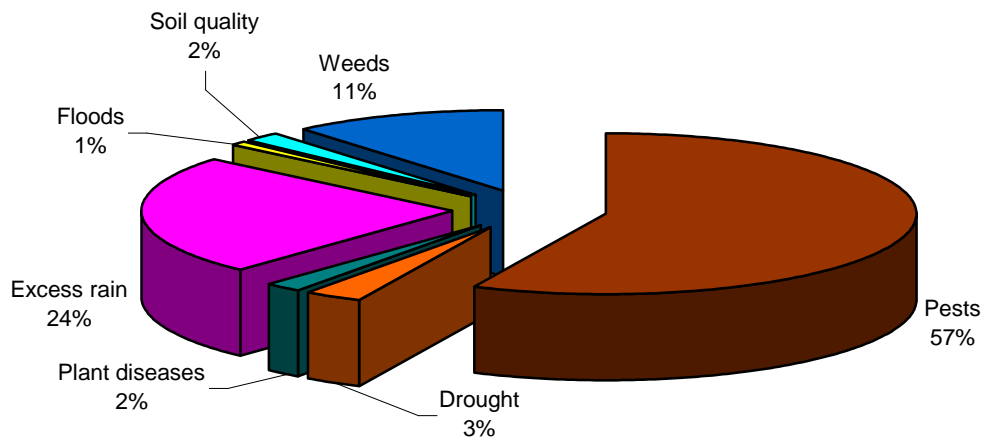


Figure 3.1: The Most Important Agronomic Constraints

Source: Ismael *et al* (2001: 15)

For control purposes, the insect pests of cotton may be divided into three groups, namely, the bollworm worm complex, red spider mites, sporadic and secondary pests. The first two groups are considered key pests because if they are controlled efficiently control of the third group is automatic (Cotton South Africa, 2000). In addition, the bollworm complex is undoubtedly the most common cotton insect pests (MPCS, 1998). Thus effective control of the bollworm complex holds the key overall efficiency of insect and mite control in cotton, since the build up of mite population often results from unwise use of insecticides for bollworm control early in the season.

In addition to these a new insect, sting bug complex, have in the year 2000 been detected in some places (Hofs and Kirsten, 2001; Anthony, 2003). The sting bug complex caused serious damages in the regions of Pongola, Maputaland and Tonga. Effective pest control with regard to cotton lies, *inter alia*, in choosing the correct registered pesticides. A survey conducted in South Africa found that 80% of control failures are attributed to poor application methods (Cotton South Africa, 2000). Poor application of pesticides occurs in spite of the existence of Act 36 of 1947, which stipulates that “the use of an agricultural remedy for any purpose other than specified on the label is prohibited” (Cotton South Africa, 2000: 12).

This means therefore that the pesticides may only be used against the insects and on the crops for which it is registered. More important to the cotton industry is that producers are well acquainted with available pesticides and their application.

3.5.3 Institutional Factors

The Small-scale Farmers' Working Group identified insecure land tenure and access to production credit as major institutional factors. Property rights affect small-scale farmers' development in that secure property right has an influence through increases in incentives for households and individuals to invest and this often also provide farmers with better credit access. Deininger (2003) argues that where effective demand for credit exist, giving formal title to land can help producers to gain access to credit and improve the functioning of financial markets. With insecure property rights, farmers cannot access production credit mainly because of lack of collateral.

Where credit is available, farmers complain that credit is not timeously released by financial institutions e.g Land Bank. Delays in responding to loan applications mean that agricultural inputs, such as fertilizer, are applied late with a consequent negative impact on yields. Alternatively, the proceeds in cash or in-kind reach the farmer at the wrong time with the result that farmers often divert the loans to other uses as a result of delays in loan disbursement (Spio, 2002). In the case of some farmers, Barnard *et al* (2002) argue that there have been delays in releasing monies even when loans have been approved. Thus poor institutional deficiencies (e.g. defective loan policies) are partly to be blamed for poor collection performance as argued by Spio (2002). The negative impacts on yield of late financing ultimately has a negative effect on ability to repay the loan. Further, the schedule of repayment is often not adapted to the flow of receipts.

In addition, when finance is made available by financial institutions, it is often inadequate to cover the full cost of crop establishment and inputs. It has also been established that even when finance is available, small-scale growers have little knowledge of financial and credit management. Associated also with access to finance are high transaction costs, with distance and transport costs as the most

important constraint. For instance, Land Bank applications for cotton farmers in the Makhathini Flats have to be lodged in Vryheid that is a considerable distance from the scheme. One way in which lack of credit was dealt with has been through contract farming. The main advantage of the contract relationship has been that ginners have been able to ensure that all facets of production are brought together through the provision of credit, extension services, etc. Cotton farmers in the Makhathini Flats, for instance, have contracts to supply Vunisa. Loans from Land Bank for cotton production are contingent on this contract. The company supplies inputs against Land Bank Loans, and amounts due by farmers are deducted at the point of delivery. Aggravating small-scale farmers' access to finance is that they have been particularly prone to indebtedness in the past. As a result, financial institutions are losing faith in small-scale cotton farming.

Most of the small-scale cotton producing schemes are either on state or tribal land with insecure land rights. This further compounds financing of small-scale farmers as the leases that are held are not recognised by the financial institutions. Over the years, there has been a great deal of uncertainty about the future of these schemes. This clearly has a negative impact on local commitment and on sustained production levels. In addition, this has led some people on some of the schemes to leave the scheme and move to other areas. Historical uncertainties compounded by land claims that have been lodged against land both within the schemes and in the adjacent areas form a major constraint. The fate of the farmers who are currently leasing the land is unclear at this stage. However, there is a window of opportunity as current leaseholders could access land redistribution for agricultural development (LRAD) grants to acquire alternative land. In this regard, the cotton industry aims to identify at least 20 000 hectares of land suitable for cotton that can be accessed by small-scale farmers through LRAD grants.

Finally, most schemes are of uniform land size making it difficult for successful farmers to expand. As a result informal leasehold markets have arisen as successful growers have attempted to increase land established to commercial crops under the constraints of traditional tenure and land size. A typical example in this case is in Makhathini Flats where land is divided into 10 hectares plots but there is a considerable incidence of informal leasing and as a consequence some

farmers are operating on much larger portions of land. According to Barnard *et al.* (2002), some farmers are operating on between 25 to 30 hectares. However, some farmers are operating on less than the originally demarcated 10 hectares. It is estimated that as much as 50% of the scheme has been informally sub-leased. However, in most cases informal land leasing arrangements have undesirable consequences since the arrangements are illegal, and in some instances leads to disputes over land and crops.

3.5.4 Declining Agricultural Support Service

The most notable agricultural support that is rapidly declining is the agricultural research service. The Agricultural Research Council (ARC) is the principal agricultural research entity in the country. It oversees 13 agricultural research institutes that involve a network of experimental farms and modern equipment. With the exception of sugarcane, ARC supports research on all the major agricultural commodities in South Africa. Research on cotton is conducted by the Institute of Industrial Crops (IIC).

The main challenge facing the ARC is a drop in parliamentary grants from a high of R337 million in 1997 to R262 million in 2002. Between 1995 and 2000, IIC experienced a 2% decline (in real terms) of its research funding, while at the same period its research staff dropped by 6%. A decline of research funding and exodus of researchers from the ARC threatens the future of public agricultural research in South Africa. Compounding a decline in agricultural support is the high cost and poor restructuring plans that resulted in the disappearance of agricultural research in some provinces (Liebenberg and Kirsten, 2002).

Provision of agricultural extension services is another constraint to cotton production. Of a major concern to the cotton industry is a lack of cotton specialist extension officers. To partly curb this problem, some ginning companies also provide extension service as part of the agricultural support package to emerging cotton producers. However, this is likely to come to an end as ginning companies envisage focussing on their main core business, cotton ginning.

3.6 Profile of the South African Cotton Growers

Estimates for the 2002/03 production season suggests a crop of about 15 000 tons of lint which according to Bruwer (2002) is close to 60% down from the crop of two seasons ago. This represents a drop of output from about 220 000 bales in 1998/99 to an estimated 75 000 bales in 2002/03. The decline in output can be ascribed to the gloomy price expectations that prevailed at planting time and to cotton hectares planted to competing crops such as maize, wheat and sunflower. A shift from cotton production to other competing crops was as the result of more attractive returns from these crops. For example, during the 2001 planting season, international prices were at its lowest level in 30 years while maize and sunflower prices were at record high levels. As a result, the area planted to cotton under irrigation fell by 49% and the dryland area fell by 42% (Gouse, Kirsten and Jenkins, 2003).

However, the 2003/04 data estimate shows a different picture of an increase in production level probably partially because of relatively higher prices in 2002/03 (Department of Agriculture, 2005). In addition, production per hectare shows an increasing trend. This can be ascribed to the adoption of *Bt* cotton seed which will be discussed in detail later in the chapter.

As with most sub-sectors in South African agriculture, cotton production is dominated by relatively small number of large (almost all white) producers. In most years, the estimated 300 large producers are responsible for 90 to 95% of the crop, while the remaining 3000 producers (almost all black) produce the balance (de Klerk, 2002). Though it has been the industry's policy to increase the proportion produced by the small growers to 30% by 2005, their actual contribution has fallen from a high of over 12% in 1996/97 to about 5% in 2001/2002. In the 2000/01 production season, a total of 157 515 bales (200 kg each) were produced on 56 692 hectares, with smallholders contributing a total of 7 300 bales (4.6%). This is despite considerable efforts by the industry, especially in respect of training and technology transfer, to increase the proportion of the crop produced by small

growers. Paucity of data beyond 2001/02 production season precluded further analysis of emerging trends.

3.6.1 Small-Scale Cotton Production

As mentioned above, majority of cotton producers are small farmers most of whom farm between 0.5 and 10 hectares under dryland. A significant number of these farmers plant only cotton as a cash crop and probably have no viable cash crop alternative unless they are fortunate enough to have irrigation. Of the average cotton area cultivated (10 063 ha) between 1996/97 and 2001/02 production season, a significant number of hectares (8 915 ha) is under dryland cotton production as shown in Table 3.2 below. Cotton production under dryland condition is erratic mainly due to irregular rainfall and sometimes due to severe climatic conditions. This is one of the main factors making small-scale cotton producers uncreditworthy.

Table 3.2 Small-Scale Cotton Farmers' Profile (1996/97-2001/02)

Province	Number of farmers (%)	Hectares (%)			Share of production (%)
		Dryland	Irrigation	Total	
Kwazulu-Natal	80	80	23	73	58
Mpumalanga	12	19	1	17	14
North-West	1	-	23	3	10
Limpopo	2	1	21	3	6
Northern Cape	4	-	30	3	12
N	3 468	8 915	1 148	10 063	11917 (200kg lint bales)

Source: Cotton SA, 2002

Kwazulu-Natal is by far the main small-scale cotton producing area in South Africa as shown in Table 3.2. It contributes 73% of the total hectares devoted towards small-scale cotton production, followed by Mpumalanga (17%). Respectively, 80 and 12% of the small-scale cotton producers are in Kwazulu-Natal and

Mpumalanga. In addition, both Mpumalanga and Kwazulu-Natal contributed 14 and 58% of cotton produced for the production season under review, respectively.

The dominance of Kwazulu-Natal in small-scale cotton production is likely to continue for the foreseeable future as a ginnery company, Makhathini Cotton, has recently opened its R50 million gin in Makhathini Flats where the unrealised potential for small cotton growers is reckoned to be greatest. The ginnery established would have an immediate effect on the provincial economy by giving local farmers a market on their doorstep. To ensure adequate and consistent volume, Makhathini Cotton regards it essential to extend cotton under irrigation. In this regard, the first phase of Makhathini master plan involves increasing the irrigation area to more than 8 000 ha.

On aggregate, time series data gathered for the period from 1996/97 until 2001/02 production season reveals a decrease of 1 and 44% of the cotton area cultivated by small-scale growers under dryland and irrigation, respectively (see figure 3.2). A significant decrease of the irrigated cotton area is due to a high degree of flexibility irrigation offers as farmers are able to shift to alternative competing profitable crops. As expected, a decline in cotton area cultivated also led to a decline in cotton production by 10% between 1996/97 and 2001/02 production season. However, estimate data for the production year 2002/03 shows an increase of 1% and 35% of the cotton area cultivated under dryland and irrigation respectively. This increase in cotton area cultivated leads to a 44% increase in cotton production.

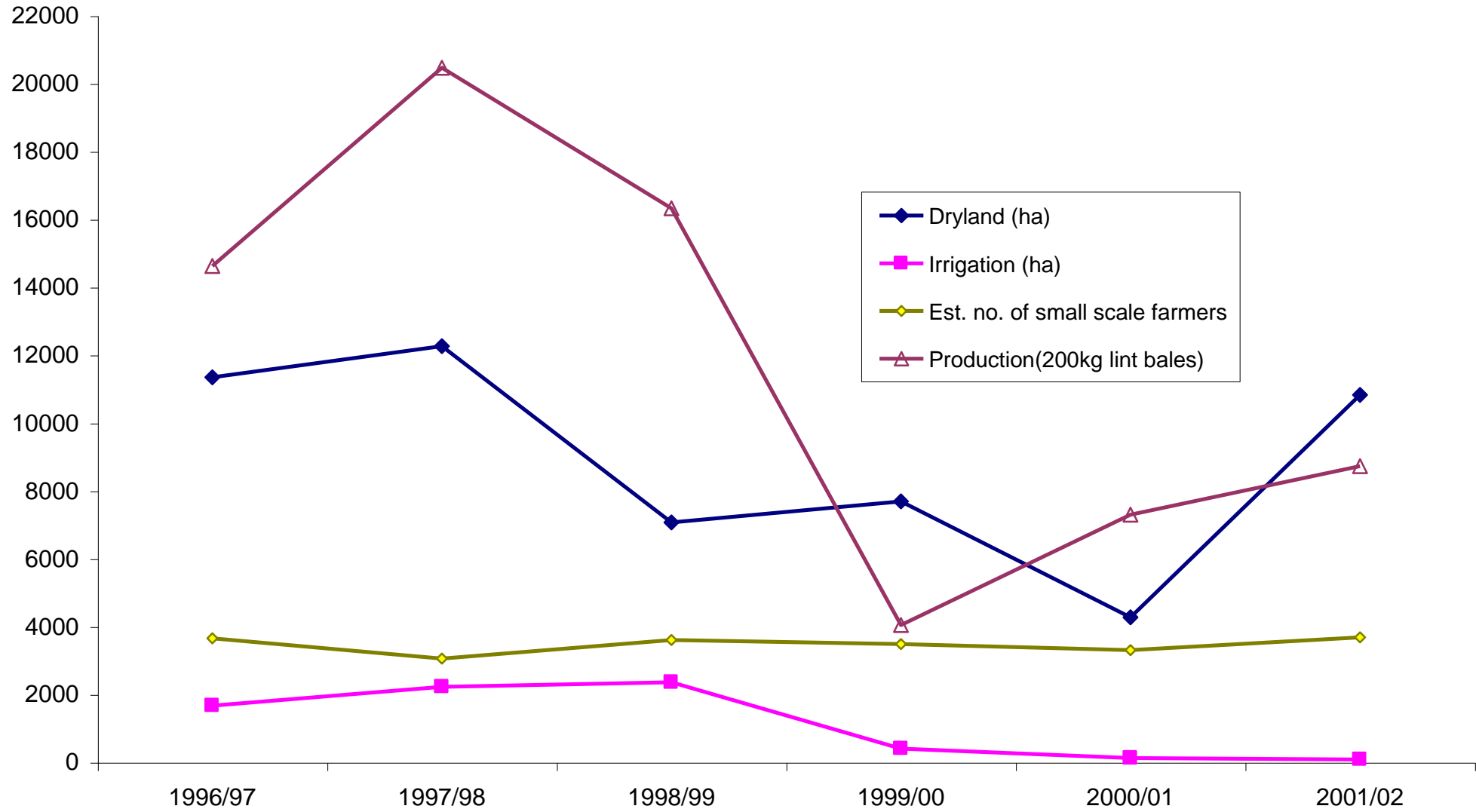


Figure 3.2: Small-Scale Cotton Production in South Africa

The cotton industry, as a result, aims to revive small-scale cotton production so as to reverse the emerging trends in cotton production through, *inter alia*, identification of at least 20 000 ha of land suitable for irrigation and eligible for LRAD grants. What still remains to be investigated in this regard is how to ensure that farmers to be settled on earmarked cotton schemes consistently produce mainly cotton and the legal, economic and social implications should cotton production be enforced.

The demand for cotton in South Africa far exceeds production and a ready market therefore exists for the small-scale cotton farmers (Cotton South Africa, undated). If the shortfall of 200 000 bales of lint is to be produced by small growers, approximately 16 000 additional farmers, each cultivating a portion of 10 hectares of land can be accommodated. Given the inherent characteristics of the cotton plant such as its drought tolerance, cotton lends itself ideally to small-scale cultivation

3.6.2 Large Scale Cotton Production

There is currently just over 1600 large scale cotton producers on Cotton South Africa's database, but not all are necessarily producing cotton every year. It is estimated that between 300 and 500 large scale cotton farmers planted cotton in the past two production seasons (2000/01 and 2001/02). The majority of large-scale cotton production takes place in 6 production areas in South Africa. Table 3.3 below provides an indication of their distribution together with the hectares for the 2001/2002 production season.

Table 3.3 Large Scale Cotton Production Distribution in South Africa (2001/2002 production season)

Province	Number of farmers (%)	Hectares	
		Irrigation	Dryland
Northern Cape	42	1 214	0
Limpopo Province	27	3 071	12 515
Mpumalanga	20	4 322	0
North-West	6	224	2 747
Kwazulu-Natal	3	620	6843
Free State	2	-	-
Number	1 672	9 451	22 105

Source: Cotton SA, 2002

The most important dryland cotton production areas are: the Springbok Flats in Limpopo and in Dwaalboom region in North-West Province. Irrigated cotton is produced around the towns of Marble Hall and Groblersdal and on the Loskop irrigation scheme in Mpumalanga, at Weipe next to the Limpopo river in Limpopo Province and in the Northern Cape (Gouse *et al*, 2003). There are also some large scale farmers in the Pongola district in northern KwaZulu Natal. Though accurate statistics are hard to come by, large scale cotton producers are in most years responsible for between 90 and 95% of the crop as stated previously.

Large scale cotton production experiences considerable annual variation. Cotton production faced an annual decline of 11% from 1998/97 to 2002/2003. The decline in large scale cotton production is due to a high degree of flexibility irrigation offers as farmers are able to switch to other alternative competing profitable crops. In most areas the major competitive crops are the dominant summer crops such as grains and oilseeds. Though the prices of these have fluctuated sharply over the recent years, they have been attractively higher. The most important of them, maize and sunflower also enjoy the advantage of being readily tradable on South African futures market, allowing farmers to reduce price risk.

3.7 Cotton Ginning

Ginning is a process whereby the fibre and the cotton seed of the cotton boll are separated mechanically from one another, usually at a ratio of 35% fibre and 61% seed. Interestingly, all the parts of a cotton boll are used in the manufacturing of a specific product. Firstly, the fibre (lint) is used to make cotton fabrics (e.g. towels etc) as well as in the manufacturing of cotton wool and pillows. Secondly, the seeds are pressed to release oil that is used in the manufacturing of cooking oil, margarine etc. The part of the seed which is left over after all the oil has been extracted is used to make cattle feed or fertiliser. Thirdly, the linters (the fluff which is left on the seed after the ginning process) contains cellulose which is used in the manufacturing of plastic and explosives (Cotton South Africa, undated).

In the 1980s, there was an average of six ginning companies in the country and a distinction was made between co-operative and non-co-operative ginners. The six ginning companies were the following:

- Clark Cotton
- Tongaat Cotton Limited
- Eastern Transvaal Co-operative Limited
- Orange Co-operative Limited
- Noordelike Sentrale Katoen (NSK)
- Central Cotton Co-operative

Before deregulation of the South African agriculture, the Cotton Board regulated cotton ginning. Some of the powers that the Board had over cotton ginning were the following (Cotton Board, 1990/91):

- No ginner was allowed to deal in the course of trade with seed cotton in South Africa unless (s)he had been registered with the Board.
- An authority to allocate cotton supply amongst ginners. The first supply allocation in each marketing year was based on the percentage seed cotton received by every individual ginner during the previous year

- The Board had the sole right to buy the surplus cotton lint. No ginner was allowed to carry over seed cotton or lint from one marketing year to the next without the written authorisation from the cotton marketing committee.

With the decline in seed cotton production in South Africa over the past decade, the number of participants in the ginning industry and the number of gins operated by them has dropped. Of the six ginning companies mentioned above, only three remain, Clark, NSK and Orange-Co-operative. Of late, the three gins are now joined by new entrants namely Limpopo Cotton and Makhathini Cotton. Clark is the largest by far, ginning about 60% of the total crop.

Because of a decline in seed cotton production, de Klerk (2002) argues that ginning capacity utilisation was estimated to be as low as 33% in the late 1990s. As a result, considering the international ambit of Clark's operation, expectation of growing integration in southern and eastern Africa and the management philosophy of its new owners (AFGRI), its focus is beginning to shift northwards (e.g. to Malawi, Zambia, Uganda). Ginners have always provided a full suite of support services (e.g. extension, credit, market) to its growers to ensure the greatest possible throughput for its mills. The cost of these services is ultimately deducted from the price that ginners pay for seed cotton.

The oligopolistic structure of the South African ginning industry gave rise to the argument that ginners have an unacceptable degree of monopsony power reaping monopoly profits at the expense of the small growers' (MPCS, 1998). This contention is primarily based on the contraction in the number of ginners and the widening of the margin between seed cotton and lint prices in Rand terms that began in the middle of 1990s. This was one of the main driving force behind Limpopo Cotton's entry into the market. Contract ginning is starting to emerge mainly as a result of the declining producers' share of the consumers' rand. For instance, the raw cotton value in a long sleeved shirt which retails for anything between R150 and R200 is R6 (Louw, 2003). Under this arrangement, the lint cotton remains the property of the farmer and the task of marketing to a spinner is best left to an agent with specialist skills. Contract ginning will now be available on a national basis to producers at any ginner at the start of the 2003/04 production

season (Bruwer, 2003). It appears that farmers who are able to go this route will realise substantial higher net prices for their cotton. Of greatest challenge to small growers is the capital required to pursue the contract ginning route.

The cotton lint is compressed and wrapped up in large bales each weighing more or less 200 kilogram. Cotton lint delivered to spinners under the agreement get graded, classified and coded in terms of agreed grading standards and regulations specified by the industry and prescribed in the cotton marketing agreement. The lint quality determines the amount of money the ginner receive. The ginner then sells the bales of cotton to a textile factory where the fibre is processed further.

3.8 Spinning and Textile Manufacturing Industry

Compressed bales get delivered to the textile mill for spinning. The lint from several bales is combined to form a uniform blend of fibre or yarn. The manufacturing of yarn is the process whereby the ginned fibre is converted into a continuous thread. During this process the fibre is loosened, cleaned, mixed, carded, drawn and finally spun (MPCS, 1998). After the spinning and weaving processes the yarn is ready for fabric forming (clothing, upholstery of furniture, sacks and bags etc.). The non-woven fabric has several uses such as cotton wool etc.

The performance of the South African textile industry is best understood from its historical development context. The South African textile industry saw its early beginnings during the first part of the 19th century in Eastern Cape. The industry expanded rapidly after the second world war. By 1960 the industry consisted of 46 textile mills producing cotton based yarns and woven fabrics. The industry reached its peak of manufactured textile output in 1981. At that time it employed 115 000 people and consumed 268 000 tons of fibre. Growth in the size of the industry was almost solely due to the growth in demand of the South African textile market. (Textile Federation of South Africa, 2002).

Today, the local textile industry is experiencing extreme competition (Classen, 2003b). During 1999 and 2000 the textile industry experienced the closure of a few

spinning and weaving mills and the closing of garment manufacturers. The main reason advanced for this is that the local industry cannot compete with the low priced and often dumped imports of textile and clothing from the East (People's Republic of China) (Louw, 2001 and Classen, 2003a). For instance, the 2000 average import price for cotton yarn from China was as low as R10,85/kg, which is about the same price that the local spinners paid for cotton fibres. Under this circumstance, it would be rational to assume that some spinners considered importing yarn rather than to spin it locally at much higher prices as it is economically more viable to do so.

In spite of the aforementioned challenges, the South African spinning and textile industry still plays an important role. The textile industry's contribution to the South African manufacturing sector over the course of the late 1990s and into the new millennium is summarised in Table 3.4 below. Table 3.4 considers the textile industry sales, employment, export and imports over a period of seven years. As highlighted in Table 3.4, sales levels have increased since 1999, after a number of years of stagnant to deteriorating performance. Employment has followed a similar trend with substantial losses recorded from 1995 to 1999.

Table 3.4 Employment and Net Trade Values in the Domestic Textile Sector (1995-2001)

Year	Sales (R'billion)	Aggregate Employment	Exports (R'billion)	Imports (R'billion)	Net Trade Value (R'billion)
1995	8,773	75 200	1,800	3,366	-1,566
1996	9,064	77 200	2,154	3,539	-1,385
1997	10,064	75 845	2,438	4,201	-1,583
1998	9,615	58 267	2,356	4,276	-1,920
1999	9,774	53 997	2,618	4,023	-1,405
2000	10,164	55 476	2,888	4,656	-1,768
2001	10,470	53 372	3,372	5,192	-1,820

Source: Textile Federation (2002)

Export and import values reveal the increasing integration of the South African textile industry into the global value chain. Both exports and imports have increased substantially over the course of the years under review, with exports increasing from R1.8 billion in 1995 to 3.4 billion in 2001, and imports from 3.4 billion to R5.2 billion over the same period. The net trade value of the industry remains negative with the 2001 trade deficit for textile sitting at R1.8 billion. In addition to these economic indicators, it is important to note that the sector remains a key user of South African agricultural products. On an annual basis the textile industry consumes 70 000 tons of cotton, wool and mohair fibre, along with 177 000 tons of local and imported man-made fibre (Textile Federation, 2002).

As a result of its contribution to the economy, the South African textile industry was highly protected. Prior to the conclusion of the Uruguay Round in 1995, the Duty Credit and Certificate Scheme (DCCS) aimed at encouraging exports was introduced in 1994 to last until 1999. Without DCCS, the Textile Federation (2002) argues that exports will in many instances fall away. As a result of this concern, the government has extended DCCS to exist until 2004.

In the latter part of the 1990's government embarked on a series of negotiations on a number of fronts to enter into free trade agreements. In January 2000, SA/EU trade agreement was introduced which was followed in September 2000 with SADC free trade protocol. A very important feature of these agreements is an intention to stimulate trade between member countries through the reduction of the increasing likelihood of unfair competition as tariffs on imports of goods particularly from SADC countries are wound down. At present about 85% of the RSA's cotton imports are sourced from SADC. According to de Klerk (2002; 9) two problems are perceived as serious in this regard;

- Smuggling of fabric and garments, especially from cheap Far Eastern sources, which are then passed off as SADC products
- The application by other SADC members of tariffs for imports of cotton (and other goods) that are below rates prevailing in South Africa.

However, future trade developments within SADC will raise new strategic opportunities for the textile industry once the duty in our neighbouring countries has been reduced to zero between 2008 and 2012 as intended.

In addition, another positive development relates to the introduction by the USA of the “Africa Growth and Opportunity Act “(AGOA) in 2001 allowing for duty free entry of sub-Saharan African clothing into the US markets. The Act shall remain in effect until 30 September 2008. The agreements with USA and EU also appear to bear fruit (Classen, 2002). Domestic demand for textile and clothing has increased and it is expected that the growth pattern that is currently noticeable in the industry will continue.

However, a study by Nogue and Staats (2003) generates a rather inconclusive answer regarding the response of Sub Saharan Africa’s agricultural exports to AGOA’S commercial incentives. Applying a gravity trade model, it was found that AGOA-induced increases (a decline in some cases) in agricultural exports were not statistically different from zero. Three reasons can be advanced for these:

- AGOA is a relatively young initiative and as such it may take longer time before its impact is materialised in terms of increased agricultural exports from sub-Saharan Africa to US.
- The implementation phase of AGOA coincided with an overall economic slowdown both in the US and the world, and this may have mitigated the real impact of AGOA on export performance in sub-Saharan Africa.
- The AGOA package covers commodities, such as textiles, that are not treated as agricultural commodities.

Pending possibilities of a free trade agreement particularly between South Africa and China are likely to have devastating consequences to the South African cotton industry. An implication of a duty free agreement is that South Africa is likely to export raw cotton and import final cotton products from China. China’s exports to South Africa are at low prices. For instance, bed linen from China is currently imported at R8.75/kg, which is the price for a South African raw cotton (Classen, 2004).

To expand trade and to take advantage of FTA, African countries will have to meet the significant challenges in their capacity to meet international production and quality standards. Without addressing standards compliance issues, Africa will be unable to take advantage of market access opportunities. Finally, given heavy subsidies and support that US and EU countries provide to their producers, the question yet remains, do FTAs (such as AGOA and SAEU) present African countries with real growth opportunities?

3.9 Adoption of Genetically Modified Cotton in South Africa

“Economics and good management dictates that we use Bt cotton as we have to meet inputs costs that annually rise way above any increase in cotton prices” (Willemse, 2003).

The latest technological development introduced within the South African cotton industry is the genetically engineered cotton. Monsanto developed Bollgard cotton commonly as *Bacillus thuringiensis (Bt)* cotton, as a novel approach to the control of insect-pest injury in production agriculture. In South Africa *Bt* cotton received regulatory approval in 1997. The original goal was to provide cotton farmers with more environmentally friendly and efficacious insect control at a reduced cost (Edge, Benedict, Carroll and Reding, 2001). To date, *Bt* cotton has been celebrated as a success story for poor farmers in developing countries. It has been adopted by both commercial and smallholder farmers in several developing countries. *Bt* cotton occupies 20% of the global cotton area. An estimated 90% of smallholder cotton farmers in Makhathini Flats area of KwaZulu Natal planted *Bt* cotton since 1997. Orton (2003) estimated that there were 4 000 small-scale growers in Makhathini Flats of which an estimated 95% had adopted GM cotton. On aggregate GM cotton accounts for roughly 75% of the local area.

According to Orton (2003), South Africa is the first country in the world in which small-scale farmers have planted GM crops on a widespread scale. However, on the other hand, Huang, Hu, Pray, Qiao and Rozelle (2003) argue that China is the nation in the world in which large numbers of smallholders have commercially adopted GM varieties. In 2000, an estimated 400 000 – 500 000 ha were planted

Bt cotton while in 1999 it was estimated that Chinese farmers planted nearly 1 million ha of *Bt* cotton. Regardless of the source of the estimates, the growth of *Bt* cotton areas globally has been remarkable.

A number of recent studies have claimed that there are clear benefits for adopting *Bt* cotton (Edge *et al*, 2001; Ismael *et al*, 2001; Thirtle, Ismael, Beyers and Piesse, 2003; Huang *et al*, 2003; Glover, 2003 and Bennet, 2003). In an attempt to understand the totality of the benefits associated with *Bt* cotton, Edge *et al* (2001) provides a comprehensive discussion on the benefits of *Bt* cotton. Such apparent benefits are summarised below.

3.9.1 Reduced Insecticide Use

A significant benefit that *Bt* cotton brings to growers is a reduction in the use of conventional broad spectrum insecticide sprays. When questioned on why they adopted *Bt* cotton, 44% of respondents in the Makhathini Flats cited saving on chemicals and pesticides as the main reason. The lower pesticides quantities applied also translate into substantial cost savings for the farmers in terms of, for example, time and labour. To properly spray a 1 ha cotton field with a knapsack would take the best part of a day and entail walking at least 20km (Bennet, 2003). The chairwoman of Mbuso Farmers Association in Makhathini echoed this benefit.

“My children are able to go to school because they do not have to walk the fields. They have more time to focus on their school work” (Cotton South Africa, 2003: 2)

Chinese farmers, for example, applied more chemical pesticides (nearly US\$ 5 billion of pesticides/year between 1980-1998) on their crops than producers in almost any country in the world (Huang *et al*, 2003). Non *Bt* Chinese cotton farmers applied pesticides as many as 40 times per season. In contrast, *Bt* cotton users sprayed 6.6 times per season on average. As a result of using *Bt* variety in Makhathini Flats chemical cost fell by an average of 33%, while a commercial cotton farmer in Limpopo Province reduced spraying from 14 sprays per season to between zero to three sprays (Ismael *et al*, 2001). In China, total insecticides use decreased by 60% to 80% in 1998 (Edge *et al*, 2001).

3.9.2 Increased Yield

With its new tool for insect management, *Bt* cotton is bringing significantly higher yields in most years for some cotton production regions. Although *Bt* cotton seed costs more than the conventional seed, the higher costs are offset by lower chemical use and yield increases which in Makhathini Flats is in the order of 20-40% (Glover, 2003). A study by Ismael *et al* (2001) revealed a yield of 425kg/ha for *Bt* adopters which is 121kg higher than that of non-adopters in 1990/00 season. A study by Bennet (2003) reveals a substantial increase in yield from 620kg/ha prior to the introduction of *Bt* cotton to an average of 980kg/ha in 2000/01 season.

3.9.3 Reduced Production Costs

Bt cotton not only reduces the number of insecticide sprays necessary, it also impacts on the total production costs associated with insect control. *Bt* technology makes it possible for a cotton grower to lower his/her investment in supplies, equipment and labour. In this regard, it is important to quote Mr Hansie Willemse (a well known cotton farmer)

“We have proven that Bt cotton has definite benefits for farmers. It reduces spraying costs and capital expenditure on expensive spraying equipment significantly. Labour costs have been reduced, yield increased and quality enhanced because overall management is so much better “ (Willemse, 2003)

When growers are able to improve yields and reduce production costs, profit per hectare is likely to be higher.

3.9.4 Improved Safety

Edge *et al* (2001) argue that any replacement of insecticide sprays with in-plant protection offered by *Bt* cotton can have significant benefits to the people handling the chemicals and those exposed to the chemicals via spray drift. In KwaZulu Natal, for example, improved safety has been realised in many ways as observed by Bennet (2003:2):

- Insecticides containers are often used to transport drinking water - *Bt* cotton reduces the numbers of containers available for this dangerous practice
- Reduction in insecticides usage reduces the risk of contamination of domestic water sources e.g in rural streams and dams
- *Bt* cotton reduces the need to handle hazardous chemical insecticides and this could have a major impact on workers' safety

Recent studies (Orton, 2003: Press Release, 2003; BBC News, 2003 and de Grassi, 2003) done in India seem to refute the aforementioned benefits associated with *Bt* cotton. For instance, it was found that 71% of *Bt* cotton adopters in India suffered an average decrease in crop yield of 35% compared with non-*Bt* adopters. In addition, *Bt* cotton was found not to be resistant to the bollworm and farmers sprayed about the same amount of pesticides.

With all the above in mind, it appears that it is not possible to conclude on the basis of a few favourable studies and a few years experience that *Bt* cotton can be relied upon to produce sustainable benefits for poor farmers.

3.10 Conclusion

This chapter has particularly analysed the structure and performance of the South African cotton industry. Cotton is a cash crop that plays a critical role in the economies of developing countries such as South Africa. It is primarily grown for its fibre as raw input for the textile industry. Cotton is critical for improving rural household incomes and facilitating the emergence of a viable commercial smallholder agriculture. The role that cotton plays in rural development, however, is constrained both by external (e.g. low international prices) and internal (e.g. agronomic, institutional, support services) factors. Low international prices arising mainly as a result of the subsidy policy probably constitutes the greatest limiting factor to cotton farmers in developing countries.

The emergent forces of globalisation and trade liberalisation present new opportunities and challenges to the South African cotton industry. The subsequent effects of low prices crowd out cotton producers and other private investors (e.g.

ginners) in the cotton pipeline. Cotton subsidies by developed countries such as USA artificially raise the level of US production, stimulate exports and, by extension depress world prices. The subsidy policy of the USA has devastating effects on developing countries and the reduction of South African cotton producers; the resultant low production of cotton lint, *inter alia*, is a direct result of this policy. Therefore factors expected to influence the long term outlook for the South African cotton industry seem to be domestic policies, the international environment and the profitability of the sector.

In an environment in which South African competitiveness is undermined by subsidies in developed countries, a pro-active approach to private and public partnership is necessary to maintain and improve the profitability of cotton for producers and downstream processors in the cotton pipeline. The transformation of the South African cotton industry requires a holistic approach and a multi-institutional collaboration that takes cognisance of national, regional and international development influencing domestic performance of the cotton industry.

CHAPTER FOUR

SOCIO-ECONOMIC CHARACTERISTICS, LIVELIHOODS AND MARKET PARTICIPATION

4.1 Introduction

Cotton is a predominantly smallholder crop in SSA, with over two million poor rural households depending on it for their main source of cash income and livelihoods (Boughton, Tschirley, Zulu, Ofico and Marrule, 2003). Using data gathered from 177 sample farmers in Moutse and Nkomazi, this chapter examines livelihoods, patterns and the level of sample households' participation into the market economy. Special attention will be given to the contribution of cash crops, particularly cotton, to households' livelihood. Results of this study are reported by study zones to detect any regional differences.

To achieve the objective of this chapter and to lay the foundation for the analytical chapters, the study begins with a brief understanding of the demographic characteristics of both the respondents and other household members. This will be followed by a discussion of households' social capital endowment and their agricultural related assets. Both demographic characteristics and households' assets are important as they influence household economic behaviour. Cotton production is one of the households' income sources. Section 4 reports on various income sources of the sample households. Section 5 examines crops grown and the reasons for growing those crops. Section 6 analyses marketing issues as well as the level of market participation of the various crops grown. In this regard, special reference is given to outgrower scheme/CF as an institutional arrangement applied in cotton marketing. Section 7 focuses on the household impact of cash crop production and is followed by concluding comments.

4.2 Demographic Characteristics of the Sampled Households

This section discusses the demographic characteristics of the sample households in the study areas. Demographic analysis is crucial as to a considerable extent demographic phenomena affect households' economic behaviour. Demographic analysis of the sample households is done for two categories, namely household head/respondents and other household members. The rationale for this is to understand both the profile of the current cotton producers as well as that of the potential future cotton producers.

4.2.1 Characteristics of the Respondents

Interviews with respondents in the surveyed areas were organised to be conducted primarily with the head of the household or any adult person in the household involved in agricultural production. The questionnaire was designed to capture the demographic characteristics both of the person interviewed and those of other household members. Attributes such as education, gender, age and employment status of household members were captured in the questionnaire. Household demographics are important particularly to Cotton South Africa in understanding the profile of the emerging cotton farmers that the industry is likely to continue serving for the foreseeable future.

Respectively, 73% and 59% of the farmers interviewed in Moutse and Nkomazi were head of the household (see Table 4.1). In addition, the majority of the respondents both in Moutse (71%) and Nkomazi (52%) were males. The average age of the respondents is 57 in Moutse and 50 in Nkomazi. The minimum and maximum ages of respondents varies slightly between the two regions. Ages of respondents range from a minimum of 31 to a maximum of 80 years of age at Nkomazi while in Moutse it ranges between 28 to 83 years. To a certain extent, age of the respondents indicates the position of the household in the life cycle.

Table 4.1: Demographic Characteristics of the Respondents

	Moutse	Nkomazi	Average/Total
Person interviewed			
Number of farmers interviewed	77	100	177
Head (%)	73	59	66
Spouse (%)	27	41	34
Gender (%)			
Male	71	52	62
Female	29	48	38
Age			
Average age	57	50	55
Formal educational level (%)			
No schooling	36	44	40
Primary	28	30	29
Secondary	33	19	26
Tertiary	3	7	5
Employment status (%)			
Employed	12	10	11
Unemployed	25	9	17
Pensioner	16	1	9
Retrenched	42	10	26
Farmer (Self employed)	5	70	38

Formal educational achievement was recorded to capture the human capital variable of the respondents. The educational level of the respondents in Moutse and Nkomazi are generally low, with high proportions of farmers never having attended school (36 and 44% respectively). Moreover, the majority of respondents (68%) in the study areas have less than 7 years of formal education. Educational achievement is important as it is likely to lead in the reduction of searching, screening and information costs. For instance, a low educational level increases transaction costs by raising searching, screening and bargaining costs. More importantly, it shows that some farmers have better access to and interpretation of information than others, e.g. reading and comprehending instructions on containers.

The employment status of the respondents varies considerably between the two regions. A key difference evident in Table 4.1 is that a high proportion of respondents (70%) in Nkomazi regard farming as a form of employment compared to a meagre 5% in Moutse. A possible reason that can be advanced for this significant variation is that unlike Moutse, Nkomazi is situated in a remote area with limited wage employment opportunities and many people always view farming as the only job opportunity available. In contrast, Moutse is situated closer to towns (Groblersdal, Marble Hall and Pretoria) and many people are likely to view farming as an employment opportunity of a last resort as their proximity to towns presents them with a likelihood of better job opportunities. This is likely to be true taking into consideration that 42% of the respondents in Moutse are reported to have been retrenched.

4.2.2 Characteristics of other Household Members

One of the strategic objectives of the South African cotton sector is broadening participation to enable emerging farmers to contribute an average of 25% of national cotton crop by 2007 and 35% by 2014. With this strategic objective in mind, it is of critical importance also to understand the demographic characteristics of the potential future cotton farmers likely to advance this objective as stipulated in the cotton strategic plan, *ceteris paribus*. In addition, according to Farmer (2003), the most important aspect of farming is grooming and cultivating the next generation of leaders on a family farm. Therefore, understanding demographics is important, assuming inheritance of the family farm. Finally, it gives an understanding of the availability of family labour at the critical period of cotton production in particular.

Household composition of the sample households is fairly balanced in terms of gender composition, 53% males and 47% females in both the study zones. Sample households in Nkomazi are largely constituted by relatively younger members compared to Moutse households. The mean age values are 19 and 30 in Nkomazi and Moutse respectively. Mean values, however, are influenced by extreme values, hence the additional use of other measures of central tendency (median and mode). The median is the middle value of the observed

measurement when arranged from the youngest age to the eldest age while the mode indicates the observation (age) with the largest relative frequency.

Table 4.2: Demographic Characteristics of other Household Members

	Moutse	Nkomazi	Average
Gender (%)			
Male	53	53	53
Female	47	47	47
Age			
Average age	30	19	25
Mode	21	12	17
Median	27	17	22
Formal educational level (%)			
No schooling	8	12	10
Primary	25	31	28
Secondary	43	52	48
Tertiary	24	4	14
Employment status (%)			
Employed	28	6	17
Unemployed	26	26	26
Pensioner	6	-	3
Retrenched	2	-	1
Schooling	36	58	47
No schooling	-	9	5
Self employed	1	-	1

A higher proportion (48%) of the household members than respondents have had between 8 and 12 years of formal schooling while 14% have more than 12 years (tertiary education). It is sensible to suggest therefore that household members in these two aforementioned categories are able to read, write and understand the business language, English. As expected the majority (47%) of household members are still schooling followed by those seeking employment (26%).

4.3 Social Capital Endowments and Household Assets

The previous section focused on the demographic characteristics of the sample households with more emphasis on human capital. This section offers an extended analysis to the previous section, but with special reference to both social

capital and physical assets owned by the sample households. Table 4.3 below summarises the results and highlights some important characteristics and variables that also affect the level of transaction costs facing small-scale farmers in the study areas.

Table 4.3: Sample Households Agricultural Related Assets and Social Capital Endowment in Moutse and Nkomazi.

	Moutse	Nkomazi	Average
Mean land size (ha)	8	7	8
Mean number of plots owned	2	1	2
Dependency ratio	1.7	4.2	2.95
Average household size	5	6	6
Household with own transport (%)	17	35	26
Household with own cultivation equipment (%)	28	2	15
Mean years of farming experience	7	8	8
Household speaks English (%)	36	36	36
Farmer belonging to farmers' organisation (%)	75	67	71
Co-operation with white commercial farmers (%)	25	1	13
Mean distance to the market	45	10	28
Livestock ownership (%)	45	7	26

Mean allocated plots of arable land are almost of the same size in the study areas (8 and 7ha in Moutse and Nkomazi respectively). The minimum number of hectares ranges from 1ha in the study areas to a maximum of 20ha in Nkomazi and 29 in Moutse. What remains unclear is whether the mean farms size in the study areas offers attractive income compared to wage employment of skilled workers. There is a limited market for arable land under the existing land tenure system. It appears that there is some informal leasing of land in the study areas as some sample farmers, particularly in Moutse, use more than one plot of land. All sample Nkomazi farmers farm on communal lands while the majority of Moutse sample farmers are on private (22%), communal (47%) and state land (23%). One implication of insecure land tenure is that there is no incentive to improve the land.

The mean length of farming experience in the study areas is 8 years but the minimum and the maximum years of farming experience varies slightly between

the two sample areas. It ranges from a minimum of 1 to a maximum of 33 years in Moutse while in Nkomazi it ranges between 3 to 20 years. Experienced households tend to have more personal contacts and networks allowing the discovery of many agricultural related opportunities. Usually there is a positive relationship between age and experience and, if this holds true, older age may reflect increased trust and reputation gained through repeated interaction with stakeholders in the industry.

Ownership of transport (mainly pick-ups, donkey carts or trailers) and ploughing equipment are the two main variables used to capture the physical assets owned by farmers. Ownership of these assets is likely to affect the level of market participation. Ownership of transport and ploughing equipment can lead to timely planting and delivery of produce to the market. Twenty-eight percent of sample Moutse farmers have own ploughing equipment compared to only 2% at Nkomazi. Those with own transport and ploughing equipment do rent their service to non-owners.

An encouraging development worth noting is the recognition of the importance of social capital as represented mainly by the percentage of sample farmers belonging to farmers' organizations and the co-operation some sample farmers receive from their white commercial farmer counterparts. Social capital is gaining recognition as one resource, *inter alia*, which can be used in support of community development. A relatively large proportion of Moutse sample farmers (25%) receive co-operation from their white commercial farmer counterpart. Through this type of co-operative linkages, sample farmers gain access to training, information, financial support and other services such as tractor services. Social capital has the potential of reducing transaction costs faced by small-scale farmers. For instance, outgrower companies (ginners) could substantially reduce the costs of input delivery, extension and purchase of produce.

According to Matungul *et al* (2001), inability to speak English, the country's main business language, prevents a resource poor and isolated group of farmers from successfully engaging in trade outside their settlements. An equal number of

respondents (36%) in the two areas are able to speak English. It is likely that most farmers in these two areas would face high transaction costs in both factor and product markets outside their own areas.

Respectively, the mean distance to the market or cotton depot for the surveyed farmers' main crop produced is 45 and 10km for Moutse and Nkomazi. Surveyed farmers were asked to judge the quality of the roads networks in the respective areas. A greater proportion of surveyed farmers in Nkomazi (97%) regard road condition in their area as good. However, surveyed Moutse farmers' judgment varies considerably, good (30%), fair (16%), poor (25%), very poor (14%). Road networks play an important role in market integration. Debilitated or inadequate road networks raise the cost of transportation, search and transfer costs and thereby limit competition and market participation. The further a household lies from a good road, the less likely it is to participate in the market. In cases where there is enough cotton supply, ginners do provide their own transport to the farmers.

Table 4.3 reveals an average dependency ratio of 2.95 in the study areas. Dependency ratio was calculated based primarily on the employment status of all the household members. Any individual of school going age as well as the unemployed (excluding welfare grant holders) were classified as dependants. Thus on average there is three dependants for each income earner per sample household. In addition, sample households have an average of 6 household members. The size of the household and the number of dependants in a household does affect the household level of market participation. It also affects the ability to accumulate assets and save, and subsequently this affects the stability of the farming venture and the ability to expand.

4.4 Households Income Diversification Strategies

Income diversification is a typical livelihood strategy for many rural households. In this study the income diversification approach was used to capture, in quantitative terms, the importance of crop production in relation to other sample households'

income sources in the study areas. In rural households, farm income varies from year to year depending on the outcome of farm production and prices obtained for output sales. Output also varies seasonally causing practical difficulties in the accuracy of recalling of crop sales. Information on diverse income sources is based on sample households' undocumented estimates. Therefore results of the composition of rural households income sources presented in Figure 4.1 needs to be treated with circumspection.

Sample household income is derived from farm and non-farm income. Farm income includes crop sales and to a lesser extent livestock sales. The main crops marketed in the study areas vary and include both field crops (cotton, maize, tobacco) and vegetables, with vegetables and tobacco most prevalent in Moutse. The percentage contribution of each income source varies both between and within the regions. Crop sales contribute by far the largest proportion (48%) of the total income sources in Nkomazi, while wage employment contributes the highest percentage (27%) of income sources in Moutse. Off-farm income is derived largely from welfare grants, remittances, wage employment, trade and markets.

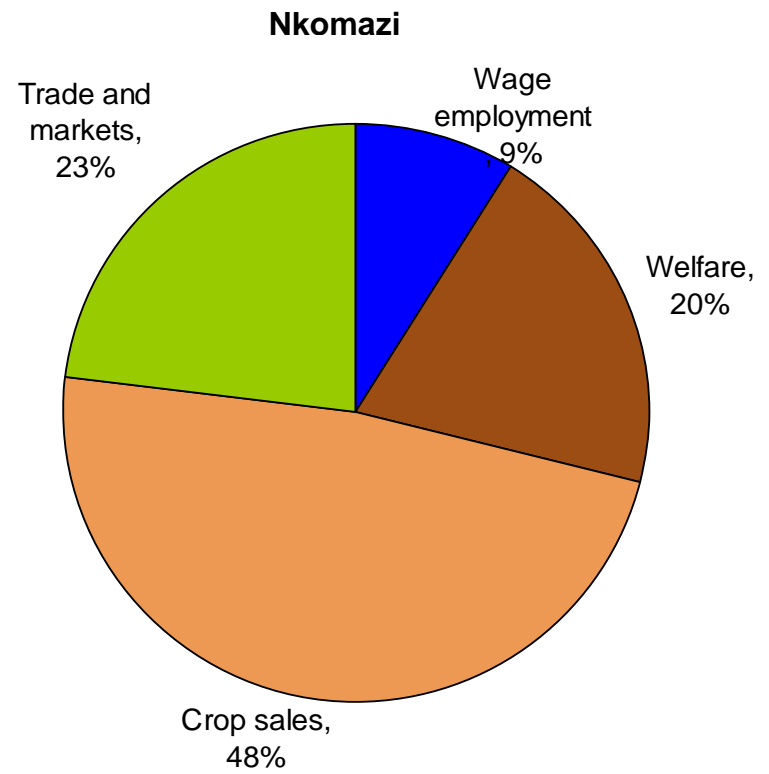
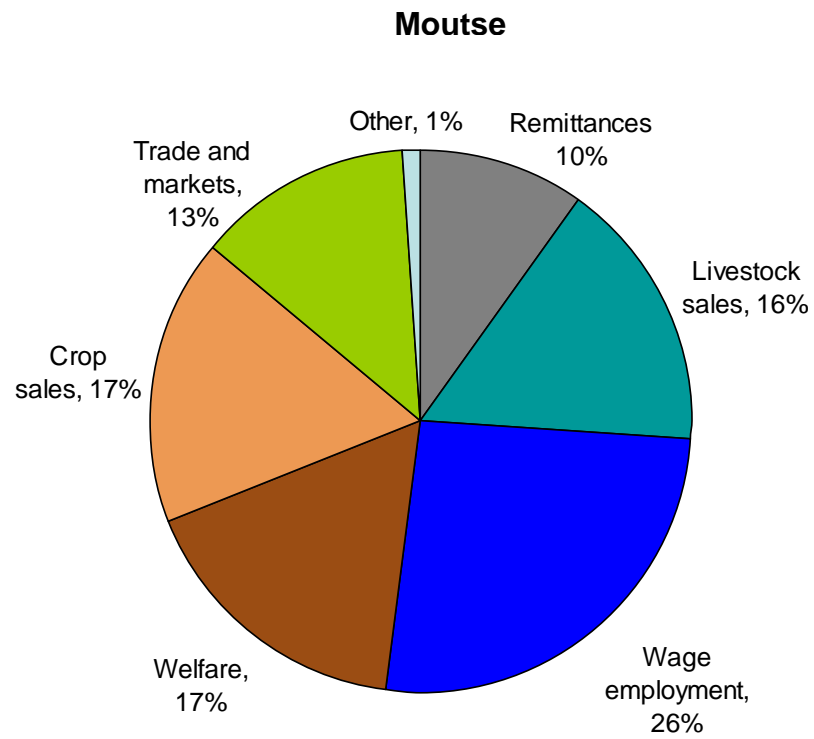


Figure 4.1: Contribution of various Income sources to the Total Household Income

It is interesting to note that welfare grants contribute almost the second and third largest percentage to the total income sources of the sample households in Moutse and Nkomazi respectively. These grants emanate from a government grant offered largely to old age pensioners; and it amounts to the value of R700 per person per month. Most of the wage earners in the study areas are public servants. Part of the income earned from these professions gets invested in agriculture. The average amount invested in agriculture per annum is R500 and R830 in Nkomazi and Moutse respectively. The greatest threat expressed by farmers is a loss of jobs especially in the public sector and this will adversely affect some sample households' income sources and subsequently financial investment in the agricultural sector.

The mean value of crop sales is R19 960 and R9 530 in Nkomazi and Moutse respectively, while wage employment is R 15 350 in Moutse and R3 140 in Nkomazi. It is evident that sample farmers have access to different income sources and therefore participation in these sources can possibly be expected to have different impacts on poverty, income distribution and ultimately standard of living. Informal discussions with some farmers identified a range of different motives and pressures that contribute to explaining why diversification occurs and explaining the pattern of diversity that are observed. Some main determinants of diversification are seasonality, coping behaviour, savings and investment strategies, differentiated labour markets and risk management strategies.

An analysis of the percentage contribution of income sources to the total household income neither reflects nor reveals the number of respondents dependent upon particular income sources. This is because it relies on monetary valuation which is determined mainly by both price and the production level. Crop sales constituted by far the most common source of income for the sample households. It was expressed by 62% and 98% of respondents in Moutse and Nkomazi respectively. The next section focuses, *inter alia*, on issues relating to crop production and nature of crops' importance to the rural households. From a

public policy perspective, it is the benefits realized by producers that make them invest into a particular activity.

4.5 Crop Production and the Reasons for Growing the Crops

With the exception of some Moutse farmers, the majority of sample households (88%) grew their main crops under dryland conditions. The main crops grown by a large proportion of respondents (86%) are field crops namely, cotton, maize, wheat, tobacco and groundnuts. Of the sample households, 71% and 98% of the respondents in Moutse and Nkomazi grew cotton as their main crop respectively (see Figure 4.2). Similarly, only 15% of the sample households grew a crop other than cotton as their main crop with a marginal 2% sample farmers in Moutse growing vegetables. Tobacco production is likely to increase in the region after a significant decline of tobacco production in Zimbabwe. The mean land size devoted to cotton production is 5 and 6ha in Moutse and Nkomazi respectively while that of maize is 2ha in both the sample regions. However, the minimum and maximum number of hectares under cotton production varies from 1-20 ha in the study areas while that of maize ranges between 2 to 13 ha in Moutse and 1 to 4ha in Nkomazi.

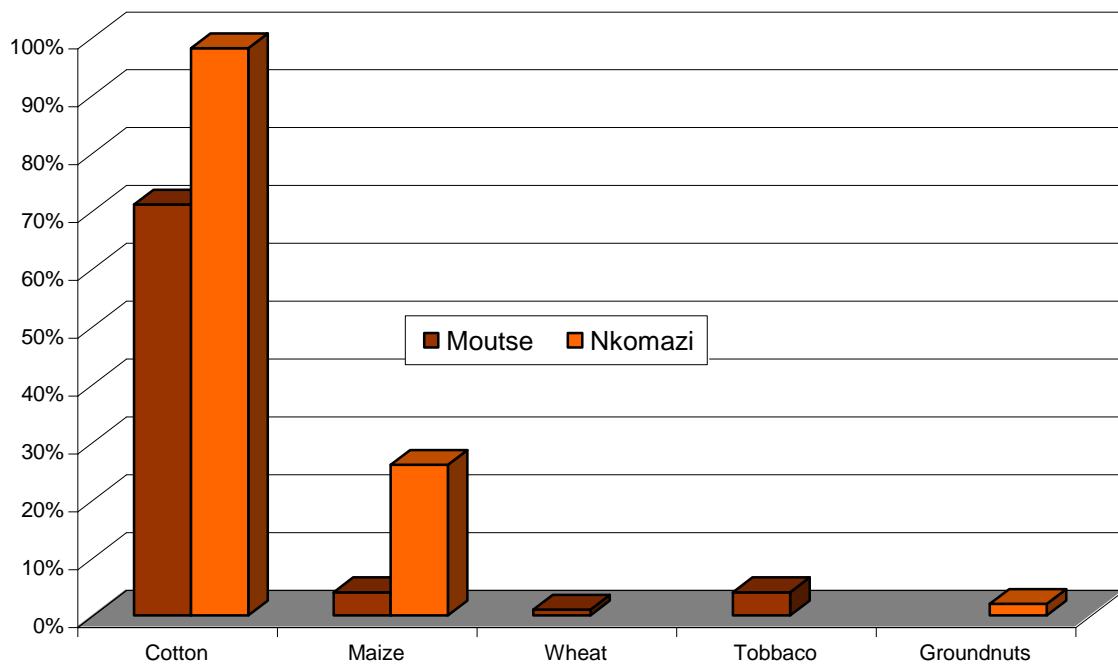


Figure 4.2 Percentage of Respondents Citing Main Crops

An attempt was made to measure the degree of flexibility in terms of crop produced in different production seasons. Time series data obtained revealed that 50% of the sample farmers in Moutse rotate cotton mainly with maize while 96% of surveyed farmers in Nkomazi practice monoculture. This is despite the fact that 54% of sample Nkomazi farmers as opposed to 92% in Moutse indicated knowledge about crop rotation. Crop rotation is limited particularly in Nkomazi because the region is relatively dry, making it suitable only for drought resistant crops such as cotton. Compounding limitations to crop rotation is that financial institutions such as Land Bank hardly promote the growing of maize, mainly because of the high risk involved. The risk is mainly social risk (theft) and lack of irrigation. It should be noted, however, that some sample farmers do practice intercropping. Intercropping is a typical practice associated with small-scale farmers who may not have enough land to diversify cropping by planting different crops on several fields, or do not have the capacity to take the risks of crop failure in monocropping systems (Spio, 1996). The undermentioned are some of the main reasons advanced for the cultivation of different crops in different years by surveyed households and are stated in order of importance:

- Crop rotation.
- Existence of complementary relationship mainly between cash and food crops
- Opportunistic behaviour as guided by market conditions (supply and demand)

However, the cultivation mainly of cotton year after year is practiced by 67% of sample households mainly for the following reasons

- Drought resistant making it suitable for dryland production (33%)
- Main source of income (15%)
- No market for other crops (12%)
- Experience and training received (4%)
- Existence of ready market (3%)

Reasons for monocultural cotton production overlap with reasons advanced by sample respondents for growing cotton. However, reasons for growing cotton vary considerably in the sample regions. In addition to the above reasons, the undermentioned are some of the reasons advanced by respondents for growing cotton as the main crop:

- Existence of a ready/guaranteed market
- Avoidance of social risk (theft)
- A profitable crop
- Experience and knowledge in cotton production
- Family encouragement/influence
- Easy crop to manage
- Experimentation (exploratory)

The type of crops grown as well as the reasons for growing such crops implicitly gives an indication of the reasons for farming or farming orientation. In addition to the above analysis, farming orientation of the surveyed farmers is crucial in the process of integration into the commercial economy. Therefore, to capture the

farming orientation, surveyed farmers were asked to mention main reasons for their involvement in agriculture as well as their future farming intentions. An important observation from Table 4.4 is that a relatively large proportion of sample farmers are involved in agriculture mainly for two reasons; agriculture is an extra and a main source of income. Evident from Table 4.4 also is that there is some regional differences. For instance, to the majority of sample Moutse farmers (37%) agriculture is an extra source of income while it is the main source of income to the majority (47%) of Nkomazi sample farmers. This result is not puzzling considering various income sources available to various households in the study areas.

Table 4.4: Main Reasons for Involvement in Agriculture by Surveyed Farmers

Reasons	Moutse	Nkomazi	Average
	%		
Main Source of food	12	10	11
Main source of income	19	47	32
Extra source of income	37	40	39
Extra source of food	16	2	10
Inherited	9	-	5
Other	6	-	3

However, reasons for involvement in agriculture as presented by Table 4.4 need to be interpreted with caution. There is likely to be an overlap amongst the reasons advanced by sample farmers. For example, some surveyed farmers referred to cotton as their source of food meaning that the income derived from cotton sales is normally used for the purchase of food. It is likely that some sample farmers referred to the two reasons interchangeably.

Finally, surveyed farmers' participation into the market economy can, *inter alia*, be influenced by how farmers view themselves in terms of their farming orientation. A significant number of farmers view themselves as commercial farmers (93% and 70% in Nkomazi and Moutse respectively). On the other hand, 27% of surveyed

farmers in Moutse are uncertain about their farming orientation. These are farmers producing mainly food crops. However, an analysis about surveyed farmers' future farming intentions reveals the following results. Respectively, 68% and 96% of sample farmers in Moutse and Nkomazi would like to become/remain fulltime farmers while a marginal number (4%) of sample Moutse farmers are prepared to leave farming should they get alternative rewarding job opportunities outside agriculture. Thus, the integration of small-scale agriculture into the commercial agricultural economy should be seen within the broader context of farmers' livelihood and aspirations.

4.6 Market Access and Participation into Agricultural Markets

It is evident from the previous section that sample farmers do participate in the market economy. This section will focus largely on post-harvest activities with more emphasis on the marketing of cotton.

4.6.1 Marketing of Cotton and Other Field Crops

The previous section showed some of the main crops grown by the sample households. The production and marketing of cotton were promoted largely by the ginners and to a lesser extent by development corporations such as KwaNdebele Development Corporation (currently part of Mpumalanga Agricultural Development Corporation - MADC). Cotton was promoted through an institutional arrangement known as outgrower schemes (contract farming).

Similar arrangements are also found in the sugar industry where small-scale growers operate as outgrowers linked to sugar mills. The most notable development within the South African sugar industry was the establishment of Financial Aid Fund (currently known as Umthombo Agricultural Finance) in 1973. FAF was established to provide economic assistance to small and developing sugar cane growers to improve and develop their productivity and efficiency (Bates, 1996). In fact, it was the primary source of credit to small-scale growers from 1973 to 1992. In addition, small-scale sugar cane growers enjoyed a multi-

institutional support from the government department, development corporation, sugar mills, co-operatives and private sector business. Up to 2002, some sugar mills provided contractual services (e.g. ploughing, ratoon management services) which led to rapid development in the in the small-scale growers' producing areas. According to Bates and Sokhela (2003), the withdrawal of such services has led to a vacuum in the provision of support services and it is probably a factor contributing to the decline in small-scale growers' production.

The critical quality attributes of cotton are length, cleanliness, brightness and moisture content. In the past these attributes were a "hidden value" as farmers never had training on the grading of cotton. Farmers were forced to rely on the ginners' quality assessment. In the event of disputes, there is no independent grading and inspection agency that could assist either party. Failure to resolve some quality disputes was reported by some farmers as one factor that led to the withdrawal by some farmers from cotton production.

Unlike in the past when farmers received a suite of support services from the ginners, currently the main type of support that sample farmers commonly receive from ginners is transport. Transport of bales of cotton is provided by ginners mainly when there is enough cotton produced. In addition, Nkomazi farmers also benefit from the input supply outlet provided by Clark Cotton/Vunisa.

There is no value adding of cotton produced at the village level and all seed cotton produced was sold to the ginners. All seed cotton produced in Nkomazi was sold to Clark Cotton while 87% of the respondents in Moutse sold their seed cotton to the same gin (Clark Cotton). The remaining number of respondents in Moutse sold their seed cotton to NSK. Thus, Clark Cotton has monopsony power in Nkomazi while Moutse farmers face somewhat of an oligopsonistic structure in the ginning industry. It appears that in future Clark Cotton will have monopsony power in Moutse as well because NSK is gradually shifting its operation to Makhathini cotton scheme in KwaZulu-Natal.

The question therefore is, what is constraining the entry of new operators in the study areas? The entry of new operators may be hindered by the fact that the

current ginning capacity is underutilized and sufficient to gin the current production of cotton. There may simply be no need for another gin.

There are various reasons that explain why farmers prefer to sell seed cotton to the gins that they have indicated. The results are presented in Figure 4.3. To a certain extent, the undermentioned reasons are some of the factors, *inter alia*, which a potential investor may consider before establishing a gin. As expected a relatively large proportion of respondents prefer selling their cotton to a particular gin because it is the only market (gin) available in their area. This reason was expressed by 38% and 83% of the respondents in Moutse and Nkomazi respectively. Competition is clearly imperfect at the farm level. Under good management gins are cost effective and economical when the amount of cotton bales to be ginned is at least between 6000 to 7000 bales of cotton. The total amount of bales produced in the sample areas for the production season under review was 3178 and 1481 bales in Moutse and Nkomazi respectively. Thus, the total number of bales produced in the study areas is far less than the required number of bales needed for a profitable ginning. As a result ginners hardly compete for the seed cotton produced. It is probably for this reason that gins have monopsony power in certain areas.

Insufficient seed production implies that productivity and total production must increase so that industry-wide unit processing costs can be reduced. Currently, low seed cotton production is crowding out other ginning companies, allowing each of the remaining firms to gin more cotton.

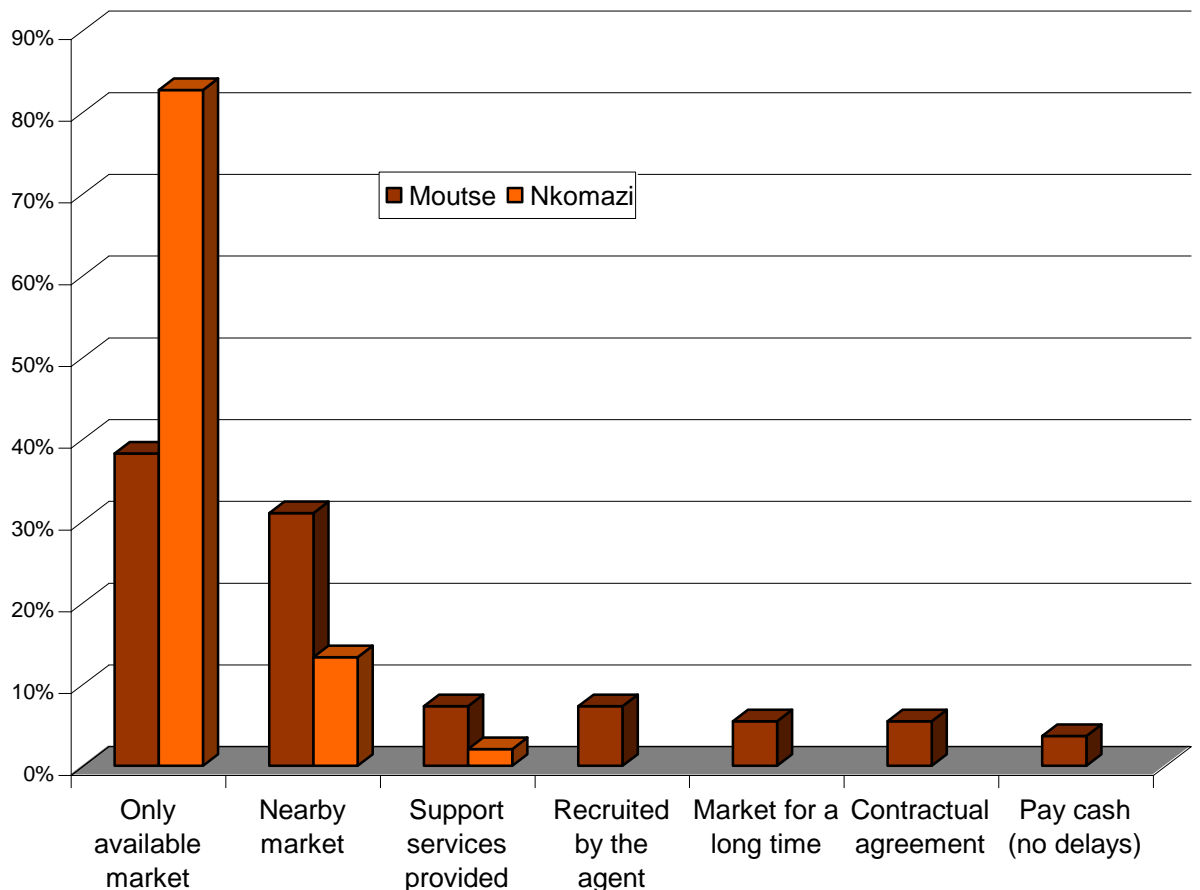


Figure 4.3 Sample Households Reasons for Selling Seed Cotton to the Indicated Gins

The second reason stated by the majority of respondents is that gins are situated nearby their farming area. Clark Cotton and NSK gins serving Moutse farmers are in Marble Hall and Mokopane (Previously known as Potgietersrus) respectively. Marble Hall is about 45Km while Mokopane is about 100Km from Moutse. On the other hand Clark Cotton gin serving Nkomazi farmers is situated in Pongola which is about 250Km away from Nkomazi. However, these gins do provide transport mostly from the depot to the actual ginnery plant. In Nkomazi, for example, Clark Cotton has established a depot which is on average 10Km from the farmers' field. Sample farmers in Nkomazi do provide their own transport for seed cotton from the field to the depot. The price that ginneries pay for a bale of seed cotton is inclusive of transport costs. But transport cost is highly subsidized and sample farmers therefore consider it to be provided absolutely free of charge.

The last common reason stated in the sample regions is the support services that ginners provide to the sample farmers. Support services provided in this regard refers to information, training and the facilitation of credit applications with the Land Bank. Farm visits by the ginners' extension agent offer the ginners an opportunity to monitor the health of the crop and therefore the farmers' ability to repay the loan. The rationale for ginneries' provision of support services is to improve the yields of farmers and thereby increase profitability. Both the direct (increase output per hectare) and indirect effects (increase number of cotton farmers) are to increase aggregate cotton output.

As indicated in the previous section, maize is the second most field crop grown by the sample households. It was grown by 26% of sample households in each region. Though Nkomazi sample farmers appear to have produced large quantities of maize, only 4% of the maize growers sold maize compared to 26% of maize producers in Moutse. The common market for maize is co-operatives and local markets in the villages. Some farmers in the sample regions exchange their maize for coupons, which upon presentation get mealie meal when the household runs short of it. This is another way in which farmers store their maize. Farmers produce maize mainly for the following reasons:

- Household consumption (food security)
- For food and sale
- Suitable crop for the area
- Highly demanded

Wheat and tobacco are produced and sold to the co-operatives which are situated in Groblersdal and Marble Hall. These field crops are grown for crop rotation purposes, they are highly demanded and profitable crops, and lastly because they are a source of income for the households.

4.6.2 Vegetable marketing

The main vegetables produced by respondents are cabbages (10%), beans (7%), pumpkin (1%), tomatoes (2%) and sweetpotatoes (2%). With the exception of beans, all other vegetables were exclusively grown in Moutse. These vegetables

are produced both for the market and household consumption. Other reasons advanced are that vegetables have a shorter growing season and are highly demanded in the area. Vegetables are usually sold in the villages where sample farmers live as well as in nearby towns (Groblersdal).

4.6.3 Level of Participation in Agricultural Markets

The level of market participation by respondents is measured by the commercialization index. Commercialization index is defined as the gross value of crop sales for a particular household in a particular year over gross value of crop production. This index measures the extent to which household crop production is oriented towards the market. A value of zero would signify a totally subsistence oriented household; the closer the index is to 100, the higher the degree of commercialization (Strassberg, 1997). Table 4.5 shows the different indices for various crops grown by the sample households. Due to measurement problems, gross value of crop production used in the calculation of indices only includes the gross value of the final crop at harvest period. For instance, the gross value of green mealies consumed by respondents was not included.

According to Table 4.5 sample farmers are commercialized to some degree. The degree of commercialization varies both by region and crop produced. Commercialization index was computed both for specific crops (herein referred to as intra-crop commercialization index) as well as for all the crops produced (inter-crop commercialization index). With regard to intra-crop commercialization index, maize has the lowest index of 0.44 on average relative to other field crops. This means that of all the maize produced in the study areas, 44% of the maize produced was sold. In Nkomazi, maize has a low intra-crop commercialization index of 0.01 compared to 0.87 in Moutse. Cotton has an intra-crop commercialization index of one in Nkomazi opposed to a 0.99 index in Moutse. Sometimes small quantities of seed cotton in Moutse do not get to the market because of lack of transport. It therefore appears that there is a need for exploring value adding opportunities (e.g. manufacturing of cotton wool) of seed cotton at the village level. Value adding of seed cotton by farmers is likely to increase farmers' share of the consumers' rand.

Turning into inter-crop commercialization index, an important observation is that by far cotton has the highest index in all the sample regions, 0.75 and 0.92 in Moutse and Nkomazi respectively. These values are derived after taking into account all the crops produced relative to cotton sold. The average commercialization indices for field crops in Nkomazi are almost of the same level. Field crops have an intra-crop and inter-crop commercialization indices of 0.51 and 0.50 in Nkomazi respectively. Variation in rainfall, soil type, institutional factors production levels and prices probably explain wide differences in the degree of commercialization in the regions.

Table 4.5 Crop Specific Commercialization Indices of all Crops Grown by Surveyed Farmers

	Moutse				Nkomazi			
	Growers(N)	% selling	Mean Land size(ha)	Commercialisation index	Growers (N)	% selling	Mean Land size	Commercialization index
Field Crops	Field Crops							
Maize	20	100	2	0.87 (0.08)	26	4	2	0.01 (0.001)
Cotton	55	100	5	0.99 (0.75)	98	100	6	1 (0.92)
Tobacco	3	100	2	1 (0.04)	-	-	-	-
Wheat	1	100	12	1 (0.004)	-	-	-	-
Average	20	100	5	0.97 (0.22)	62	52	4	0.51 (0.50)
Vegetables	Vegetables							
Beans	7	100	3	0.74 (0.01)	1	0	1	0
Tomatoes	3	100	1	0.83 (0.01)	-	-	-	-
Pumpkins	2	100	4	0.91 (0.05)	--	-	-	-
Sweetpotatoes	4	100	1	0.84 (0.001)	-	-	-	-
Cabbages	9	100	3	0.75 (0.02)	-	-	-	-
Average	5	100	2.4	0.80 (0.018)	1	0	1	0
Horticulture	Horticulture							
WaterMelon	6	100	3	0.90 (0.02)	-	-	-	-
Average	6	100	3	0.90 (0.02)	-	-	-	-
Household Commercialisation index = 0.91 (0.09)					Household Commercialisation Index = 0.26 (0.25)			

4.6.4 Contract Farming (CF)/Outgrower Schemes

Cotton was grown under formal contractual agreement in the past. Cotton farmers had contracts to supply ginners with seed cotton. Under this arrangement ginners provided farmers with inputs such as credit, extension *etc* and the amounts due by farmers were deducted at the point of delivery. Ginners, Vunisa in particular, borrowed the money from Land Bank which they extended to the cotton farmers as a loan. Initially, all the credit risk involved was incurred by the ginner and as time progressed the risk became unbearable. As a result, ginners became only the agent for the Land Bank. The greatest advantage in this regard is that Vunisa, in particular, had a database of the majority of small-scale cotton producers including their credit record.

Ginners began the outgrower schemes with a particular objective in mind – increasing the supply of seed cotton to the ginnery in order to utilize the ginning capacity more fully. The biggest problem experienced with this arrangement was non-repayment of loans. An inherent characteristic of dryland crop production in South Africa is the high production risk due to adverse weather conditions, drought probably being the most important (Nel and Loubser, 2004). Cotton production under dryland is erratic and as a result cotton farmers have been particularly prone to indebtedness in the past.

Some initiatives by Development Corporations such as KwaNdebele Development Corporation compounded the problems experienced under this arrangement. The most notable error in initiative was apparently its failure to pass on the farm business managerial expertise to the farmers, lack of transparency on how input costs were deducted and communication particularly with regard to contractual agreements. As a result, some cotton farmers feel that they were relegated into being labourers on their own land and also led many farmers to conclude that they were being exploited.

According to the Land Bank, provision of credit directly or indirectly by the ginners relied mostly on reputation as an incentive to repay i.e. a farmer repays the loan in order to maintain his/her creditworthiness. However, this was problematic especially when applied on a large scale as farmers who defaulted reapplied for credit for the following year under different names. For example, a wife can apply in the place of a defaulted husband. As a result it is not surprising to find adult members of certain household being uncreditworthy (blacklisted) today. According to Macaskill (2004), there seems to be a culture of non-payment (estimated to be 85%) and lack of business knowledge (skills) amongst the majority of small-scale cotton producers. It has been observed that some of the blacklisted farmers do make profit on their farms and yet do not attempt to repay the loan to the Land Bank.

At the time of the survey, it was discovered that cotton is currently grown under verbal contractual agreements. The contract stipulates that depending upon the quality, all seed cotton produced will be bought. Table 4.6 shows various reasons expressed by sample farmers on why they participate in contracts. These reasons were advanced by 95% and 50% of the respondents who grew cotton in Nkomazi and Moutse respectively.

Table 4.6: Reasons why Sample Farmers Participate in Contracts

Reasons	Moutse (N=28)	Nkomazi (N=93)	Average N=61
	%		
Offers guaranteed market	75	10	42
Advised by an extension officer	7	-	4
Commercial motive	14	-	7
Only contract available/known	4	84	44
Nearby market	-	6	3

The main reasons advanced for entering into the contractual agreement varies between the regions. The majority of sample farmers (75%) in Moutse entered into

the contract because it offers them a ready market for their cotton. As one farmer puts it “*guarantee me a market I can even farm on the tarred road*”. On the other hand, a large proportion of sample cotton growers (84%) in Nkomazi entered into the contract because they never had any alternative contract.

Though farmers are concerned with the declining level of support that they receive, farmers appear to be somewhat satisfied with the contractual agreement. Farmers were asked to mention the most important attributes they like of the contract. At least 42% and 67% of sample cotton growers in Moutse and Nkomazi respectively managed to state attributes of the contract. A striking observation is that a large proportion of sample farmers (40%) in Nkomazi like the training and extension service that ginners provide as reflected in Table 4.7. This can be attributed to the fact that ginners provide farmers with cotton specialists who, *inter alia*, visit, inspect and monitor progress on their farms. To a certain extent, the level of responses by respondents indicates the level and type of support that ginners emphasize and provide in each region. Alternatively, it indicates areas of support deficiency that prompted ginners to offer such a service.

Table 4.7: Contracts’ Attributes most preferred by surveyed Farmers

Contract attributes	Moutse N=23	Nkomazi N=65	Average
	%		
Non binding contract	39	17	28
Guaranteed market	22	14	18
Offers credit	26	17	21
Incentive to work hard	13	11	12
Training and extension	-	40	20
Transport to market	-	2	1

Access to credit is one of the most important constraints limiting the development of small-scale farmers. As part of the support package, 22% of sample farmers like credit offered by the ginners. Timely release of this credit by ginners is also one of the credit arrangements that some farmers like most. Currently, some ginners only

facilitate credit applications with the Land Bank. Support services offered by ginners are likely to decline as they envisage focusing on their main core business of cotton ginning. At the time of the survey the Mpumalanga Provincial Department of Agriculture (MPDA) was facilitating loan applications on behalf of the farmers with the Land Bank Branch in Nelspruit. To minimize the problem of default, Land Bank would release the loan only once the MPDA is satisfied that the moisture content in the soil is high enough for planting. Thus, in future, loans will only be released with the approval of the department. The credit application facilitating role by the Department is likely to continue for years to come as the Nelspruit branch of the Land Bank seems to be committed to establish cotton clients. At present the Nelspruit branch of Land Bank alleges that they do not have cotton clients in the Lowveld region. This is understandable considering that in the past Nkomazi cotton farmers were served by the Vryheid Branch of Land Bank which is 450Km away from Nkomazi.

The Vryheid branch of the Land Bank was preferred over the Nelspruit branch for the following reasons. Firstly, small-scale cotton producers' credit applications were largely done with the Land Bank through Vunisa. Vunisa had a long-term relationship with the Vryheid branch and possess the database with a credit record of the majority of small-scale cotton producers. This considerably reduced the transaction costs associated with credit applications. Secondly, the Vryheid branch was adequately staffed as opposed to the Nelspruit branch. MADC is another institution beginning to finance small-scale producers; and at the time of survey only 10 cotton production applications had been approved.

4.7 Impact of Cash Crop Production at Household Level

The issue of cash crop production is profoundly controversial (Maxwell and Fernando, 1989). There are two schools of thought regarding the production of cash crops. Critics of cash crop argue that the production of cash crops do not make any contribution to alleviating rural poverty and hunger. The other school of thought argues contrary to the above. For the purpose of this analysis cash crops mentioned in this section refers specifically to cotton.

In the light of the above, this study attempts to identify the impact of cash crop primarily at the household level. These impacts were determined within the context of contract farming as a model employed to promote cash cropping in the study regions. Impacts of cash crops were determined on the following account: employment, hours of work, household gender relations, household food security and household income. In South Africa, small-scale cotton production has a long tradition of outgrower schemes and until recently almost all cotton was grown under outgrower schemes. This analysis was somewhat limited because some farmers have been producing cotton under contract ever since they started with farming, making it difficult to determine the impact of cash crop production.

4.7.1 Cash Crop Production and Food Security

Critics portray cash crop as the enemy of household food security. It is argued that sales of agricultural output undermine access to food. This view can be refuted by focusing closely on the definitional aspects of food security. Food security refers to access by all people at all times to enough food for an active healthy life.

The above definition centres around two concepts, food availability and food access. The first refers to the supply of food available at the local, national and international level. Food access is similar to Amartya Sen's concepts of exchange entitlement. Food entitlement refers to the capability of individuals and households to obtain foods. According to Greenberg (undated), this concept simply points to the set of things a person is able to swap for what they own or the relationship between assets a person has and what those assets can be exchanged for. Thus, people may have entitlement through direct ownership of food or through the ability to exchange something else owned by the individual for food not directly produced by the individual. Similarly, this concept suggests that people do not usually starve because of an insufficient supply of food, but because they have insufficient resources including money ('entitlement') to acquire it (Sen, 1981).

In essence, food insecurity can occur either because one has produced less food than needed for own consumption or because one can obtain less food through trading by exchanging one commodity (which may also include money from selling

labour power) for food. Thus, policy aimed at improving food security can look at either of the following (Greenberg, undated);

- Strengthening the individuals' assets or endowment or
- Improving their exchange entitlement or both

This analysis takes one beyond the truism that food security is based on a combination of an ability to produce food and an ability to buy food. It considers the relationship between the two more closely, and the relationship between access to income and the possibility of converting that into enough food.

Food security clearly depends on both food production and food purchasing power. Cotton is an important cash crop for millions of farmers worldwide and the income it generates contributes to rural households' food security (Fortucci, 2001). At the rural household level, the contribution of cotton production to food security is mainly through income. When households are specialized in cotton production, there is a direct link between cotton production and their ability to buy foodstuffs and other goods. Cash income is needed by rural households to acquire healthcare, more nutritious foods such as meat, milk, fruits and vegetables, clothing, housing and many other services. The shift from subsistence food production to market production does not pose a serious problem to food security. In fact, it may even enrich the diet of the population by enabling it to obtain a wide variety of food from all over the world. Research results in the study areas reveals that sample cotton households used the income derived from sales mainly for the following:

- Buying food for the family
- Savings in the bank
- Re-investment in agriculture
- Pay employees
- Education for the children

The above income uses have some indirect effects towards household food security. The direct income effects are greater considering both forward and backward linkages that are generated by the increased demand for other goods and services. For example, the establishment of the cotton input outlet in Nkomazi

had some positive externalities in the production of other crops such as maize. It's establishment resulted in the buying of fertilizer, herbicides etc used in the production of food crops. In addition, spillover effects are also realized in the training and extension services offered and in some instances such training is not cotton specific; the knowledge obtained is therefore applied to increase production of other crops. Thus, there is a certain degree of synergy between cash and food crops. The various pathways, by which crop commercialization can affect food security and incomes under conditions of market failures, need to be more clearly understood to develop more informed policies in support of smallholder welfare (Govere and Jayne, 1999).

Finally, at the national level, export revenue makes it possible for a country to access food through imports. Although the import bills of countries such as Mali, Togo, Benin, Chad and Burkina Faso could have been met without cotton revenues, their ability to import other goods would have been severely curtailed (Fortucci, 2001). In fact the declining cotton prices and earnings of recent years have been accompanied by downward adjustment in total merchandise import.

4.7.2 Employment

Commercialization of agriculture affected the level of employment in the study areas. Sample farmers benefit from additional employment opportunities arising from contracts since they often face high transaction costs when selling labour off-the farm. Changes in employment took place in the use of hired labour versus family labour. Cash crop production seems to have had a greater positive impact on employment in Moutse. The majority of cotton growers in Moutse (51%) indicated an increase in the use of hired labour as a result of cash crop production. On the other hand, the majority of cotton growers (89%) in Nkomazi indicated that nothing has changed. It appears that because of agro-climatic conditions in Nkomazi sample farmers have been growing cotton under contract for a very long time and it is therefore difficult to determine the effect of cash crop production in the area. However, informal discussions revealed that most farmers use one hired labour per hectare of cotton; this number usually increases at critical key periods

such as harvesting. The higher yields as a result of Bt cotton increase the employment opportunities and this benefit far outweighs the lesser labour effect introduced by less spraying (Bennet, 2003).

Farmers are paid on the basis of the quality of seed cotton produced. High quality seed cotton is a result, *inter alia*, of good agronomic practices such as weeding, pest control etc. To produce high quality seed cotton, farmers hire labourers at critical periods of plant development in anticipation of getting good financial returns. Cotton is widely acknowledged to be particularly input demanding while on the other hand the quality of seed cotton degenerates quickly, making good management of the crop critical.

In addition, future plans revealed farmers' willingness to grow cotton as a strategy to curb unemployment in remote areas like Nkomazi. Favourable wage effects from increased employment are expected to spread the benefits of the increased labour demand in agriculture across a broad spectrum of the rural economy.

Closely related to the preceding debate is the impact of employment on food security. It is a plain truth that employment creation increases food security. In simple terms, by selling his labour power, an employee can get a wage and with that buy commodities, including food. Greenberg (undated) refers to security as a secure ownership of or access to resources and income earning activities including reserves and assets to offset risk, ease shock and meet contingencies. The entitlement approach argues that people with access to assets or involved in income earning activities and who are able to convert that income into food are unlikely to suffer from food insecurity.

It is important to remember that employment created by cotton growing extends beyond the farm fields. Cotton production also induces additional employment and export revenue from textile and clothing manufacturing. The export revenue from textile and clothing and employment in the cotton ginning, weaving, processing, marketing and transportation have very important income and food security implications for the country and households living both in the rural and urban areas.

4.7.3 Hours of work

Closely related to the employment effect is hours of work devoted to cash crop production. Hours of work devoted to cotton vary according to the stages of (cotton) plant development. For example, weeding, spraying and harvesting are critical in cotton production. Only few cotton growers (15%) in Nkomazi reported to have realized an increase in hours of work per day. However, the majority of sample cotton growers (69%) in Moutse reported to have observed some changes in the hours of work. The majority (47%) indicated an increase in hours of work per day. Increase in hours of work per day ranges from a minimum of 1 hour per day to a maximum of 2 hours in the study areas. In some instances school children are used to avoid an increase in the hours of work. Farmers usually work an average 7-8 hours per day.

4.7.4 Household Gender Relations

Information on household gender relation effects of cash crop is limited. Sample farmers were reluctant to comment on this issue as it appeared to be sensitive. A higher proportion of sample cotton growers reported to have realized no change in household gender relations. However, a marginal number of cotton growers (2%) realized an improvement in household gender relations as a result of the income derived from cotton sales.

The above is closely related to individual households' relations with other members of the community. The general feeling among sample households particularly in Nkomazi is that relations with other members of the community never changed as a result of cash crop production. However, to a lesser extent, some sample cotton growers in Moutse seem to have experienced deterioration in relations with other members of the community. Jealousy by other members of the community was the concern expressed most often by some cash crop producers while a few farmers gained recognition in the community as a result of higher income and assets acquired.

4.7 Concluding Remarks

The objective of this section was to examine household demographics, livelihoods and the role of cash crop, cotton in particular, to the farmers' livelihoods. Sample households have diverse income sources that constitute part of their livelihoods. Variation in sample household demographic characteristics partly explains various income sources of the household. Sample households grow various field crops with cotton being a commonly grown crop by the majority of sample farmers. Cotton is grown under verbal contractual agreement between farmers and the ginners. Ginners provide a suite of services to the farmers, the most notable one being the guaranteed market. The growing of cotton also impacts positively on the household of sample farmers. In some cases there is a synergy that exists between food and cash crops. However, there is an emerging concern emanating from a decline in the level of support that ginners provide under the contractual relationship. The declining level of support is likely to reduce the level of farmers' participation into the commercial agricultural economy, and subsequently this will adversely affect farmers' livelihoods. Success of CF arrangements depends largely on the ginners'/banks' ability to recover the loans.

CF is important and appears to be the future of commercial agricultural production. The transformation of the rural sector requires a holistic approach and therefore requires multi-institutional collaboration. In view of this, there is a need for government and other stakeholders in the cotton industry for an active participation and involvement particularly in monitoring and evaluation of contractual agreements. Monitoring and evaluation will timeously diagnose and remedy problems threatening the continuation of CF.

PROFITABILITY ANALYSIS OF COTTON PRODUCTION IN MOUTSE AND NKOMAZI, MPUMALANGA PROVINCE

5.1 Introduction

South African agriculture has undergone a massive restructuring since 1996. Prior to 1996, major agricultural products (including cotton) were regulated by the agricultural marketing boards. These boards were, *inter alia*, responsible for setting of price floors. Agricultural production was not exposed to international competitive market forces. Although some deregulation occurred with some products since the late 1980's, the system remained a regulated system; cotton did not experience deregulation. The repeal of the Marketing Act (1968) and the promulgation of the Marketing of Agricultural Product Act (1996) changed the scene. From 1996, agriculture, in general, was subject to a process of deregulation, tying most products to world markets. The dismantling of marketing boards (including Cotton Board) together with decreases in tariffs and non-tariff barriers has meant that prices, including cotton prices, are nowadays much more tied to international prices. A heated and highly contentious issue in this regard is the agricultural subsidies the USA gives to their cotton farmers. Although subsidisation leads to especially low prices for consumers, such subsidisation has distorted the world markets, depressing prices for producers in the rest of the world, including practically all the developing countries.

As a result, the profitability of cotton production in the developing countries like South Africa has been under some serious debate in the recent past. This debate coincides with the revitalisation of the South African small-scale cotton industry in particular.

This chapter evaluates the profitability of smallholder cotton producers in the sample regions. The purpose of the analysis is to support producers and planners

by providing empirical evidence of the profitability of cotton and also to use the results in an appropriate management decision model. Section two presents the methodology and data limitations. Section 3 examines the costs of production incurred by emerging cotton producers in the study zones and this is followed by a discussion of the results of the gross margin (GM) analysis. The study proceeds with a sensitivity analysis. Section 6 discusses the result of break-even analysis (BEA), followed by major constraints limiting cotton production as expressed by some emerging cotton growers. Constraint analysis, *inter alia*, helps one to understand why small-scale cotton production performs the way it does. The chapter concludes with some recommendations.

5.2 Data Limitations and Methodology

The data analysed in this section refers to the data collected from the sample farmers who grew cotton in the 2001/02 production season. As shown in chapter 4, 98 and 55 sample farmers grew cotton in Nkomazi and Moutse respectively. One should keep in mind that the reliability of both income and costs data is always questionable in small-scale agriculture where record keeping is limited. Low levels of education as well as lack of aptitudes for managing farming as a business do not lead to adequate incentives for farmers to keep and maintain farm records. To partially deal with this problem data from the MPDA, Land Bank and Clark Cotton was also used to supplement data from sample cotton farmers. In addition, data provided by farmers was verified with key informants where necessary. Given the absence of irrigation, rainfall quantity and its distribution within the cropping season is essential to cotton production in the study areas. In this context, analysis of data from a single season needs to be viewed with caution.

The financial analysis measuring the profitability of the cotton industry will be conducted within the gross margin (GM) approach. Where scanty information exists, GM is more suitable because it does not require more comprehensive budgeting techniques. GM measures the efficiency with which variable cost inputs are converted into output and its calculation does not include fixed cost. Compared with variable costs, changes to fixed costs are irregular and lumpy, and

to allocate them to single enterprises is difficult and arbitrary. When a farmer examines the profitability of an enterprise (s)he is usually faced with a problem of how to allocate both variable and fixed costs. If good records are kept the farmer may be able to establish the cost of input for each enterprise. However, in a mixed farming economy and especially if multiple cropping is used, farm resources such as rent, permanent labour etc are shared between the various enterprises and it is usually difficult or even practically impossible to work out the economic cost of the share used by a particular enterprises or crop within a multiple cropping system. The GM concept was introduced to circumvent the problem of dealing with fixed cost when calculating the relative profitability of the enterprise (Buckett, 1988). GM does not consider price and yield risk. Sensitivity analysis will therefore be conducted to illustrate the effects of yield and price variations.

Break-even analysis (BEA) will be conducted to supplement the GM analysis. BEA will be applied mainly to evaluate the financial viability of the small-scale cotton industry. It is a powerful decision making tool in determining the cost recovery price, level of production and profit.

5.3 Cost of Production

Sample cotton farmers buy most of their inputs. The majority of the respondents in Moutse (91%) and Nkomazi (77%) buy their inputs from the co-operatives and Vunisa respectively. The main source of credit is Land Bank as mentioned by 69% and 97% of cotton growers in Moutse and Nkomazi respectively. However, some cotton growers particularly in Nkomazi mentioned Vunisa as their main source of credit. This needs further clarification because as explained in Chapter 4, Vunisa acts as an agent for the Land Bank. The loans offered to the farmers need to be repaid with interest (18%) at the end of the production season.

At the time of the survey the Nelspruit branch of Land Bank was prepared to offer production loans for the 2003/04 production season to the amount of R1350/ha. But, as a risk management strategy the bank revealed to the creditworthy farmers the production loan to the amount of R1000/ha. The balance withheld was going to be released only when absolutely necessary. In addition, this branch was reluctant

to finance inputs (e.g. wages) that were under the direct control of the farmers. This was done to minimise the unintended use of credit. The bank was only going to pay directly to the input suppliers based on the invoices submitted. Major inputs used by the cotton growers in the study areas will now be discussed.

5.3.1 Cotton Seed

Sample farmers planted cotton seed bought from Vunisa. At least 1% of cotton growers bought cotton seed from Delta Pineland (seed company) in Groblersdal. The cotton seed variety applied is the GM cotton (NuCOTN 37-B with Bollgard™). Monsanto owns the Bt gene and Delta Pineland developed the Bt NuCOTN 37-B cotton variety that contains the Bt gene. This cotton variety is preferred by some cotton growers for the following reasons:

- It requires less insecticides application (58%)¹
- It offers high yield (10%)
- It has labour saving properties (8%)

The adoption of Bt-cotton impacts on farm income mainly in three ways (Gouse, Kirsten and Jenkins, 2003):

- Decreased input costs through savings on pesticides chemicals and application costs;
- Increased input costs through higher seed price and additional technology fee and
- Increases in yield

It is interesting to note that at least one cotton grower used the Delta Opal RR cotton variety. The main difference between the two varieties is that the former (NuCOTN 37-B with bollgard) is tolerant to insects (bollworm) while the latter is tolerant to weeds. There is a newly developed cotton seed variety (known as NuOpal RR) that possesses both of the aforementioned traits. Although this appears to be a great technological discovery, this variety has not yet been released for public consumption. The national government appears to be reluctant

¹ Figures in brackets refers to the number of respondents and does not add up to 100 as some cotton growers did not give reasons

to approve its public use for safety reasons. This variety has a great potential of increasing the profitability of small-scale cotton producers (Macaskill, 2004).

The amount of seed applied per unit differs according to the planting methods. Manual planting is more efficient than the mechanical planting applied by Moutse cotton growers. Nkomazi sample cotton growers apply Bt cotton variety at an average seed rate of 5kg/ha as opposed to the Moutse average seeding rate of 10kg/ha. Mechanical planting is applied despite the Department of Agriculture's advice of manual planting. Seeds are usually packaged in 25kg units that retail at R883.50 per package.

5.3.2 Fertiliser

Fertiliser is used only by Moutse cotton growers. Of Moutse cotton growers, 93% used fertiliser bought at an average price of R105 per 50kg bag. Farmers indicated using almost 2 X 50 kg of fertiliser (2:3:1/3:2:1) per hectare. Thus, it cost sample farmers about R210 to fertilise a hectare of cotton. In addition farmers apply 2 bags of LAN fertiliser/ha at a cost of R95/bag.

5.3.3 Ploughing and planting

Ploughing is done by tractors at a cost of R300/ha. In areas such as Moutse ploughing is followed by discing which cost R200/ha. As mentioned previously in Moutse planting is done mechanically at a cost of R200/ha.

Depending on the rainfall of the region, the optimal planting time for cotton ranges from mid-October to mid November. Sample cotton growers indicated ploughing and planting of cotton around these times with the largest proportion (48%) doing it mid October. Farmers usually plant the crop just after the rain, that is, between October and February. In worst cases cotton is also planted in mid December especially, when the rains are late. The results of delayed planting mean that the crop is planted after the optimum planting date and a much lower yield can thus be expected. Lower yields subsequently affect the profitability of the crop.

5.3.4 Labour

Activities on the farm are carried out by family members along with some hired labour. All cotton growers in Nkomazi and 45% in Moutse indicated making use of casual labour. With the exception of planting in Moutse, casual labour is employed to perform the following farm activities: weeding, spraying and harvesting. The demand for casual labour varies by farm activity, farm size and gender. For instance, harvesting is more labour intensive than weeding while spraying is a laborious task performed mainly by energetic males. In addition the rates paid for casual labour varies considerably both within and between regions. Casual labourers in Moutse are highly paid relative to those in Nkomazi. For example, the amount of money earned for weeding by Nkomazi casual labourers varies between R10-15/day while in Moutse it varies between R14-20/day. Wage differentials are probably indicative of labour availability between the two regions.

The number of days taken to complete a particular activity is determined by the number of casual labourers employed. While cotton has a growing span of 6 to 7 months, casual labourers are usually employed for a maximum number of three months. Typically, it takes two labourers, family and hired, to work a hectare of cotton. Family labour does not represent a direct cost to the family and was measured in terms of the opportunity costs.

According to Strassberg (1997) there are three methods to value the opportunity cost of family labour

- The official minimum wage or some proportion thereof
- The wage rate at which sampled households sold labour off-farm and
- The wage rate at which non family labour was hired by households in the sample for employment on their cotton fields

Relying on minimum wage poses two theoretical disadvantages. First, it does not reflect the true scarcity value of labour within the rural economy, particularly if there are statutory minimum wages, as in some sectors, including agriculture and domestic services in South Africa. Method two represents a reasonable alternative, in that it would capture for each household the rate at which it actually sold labour off-farm; however, limited off-farm employment opportunities and skills

levels of the sample farm families argue against its use. Therefore, method 3 is used in this study as it offers two advantages. First, it assumes that if sampled households attempted to sell their labour they would have received approximately the same wage that sampled households actually paid to non-family labour. This assumption holds true in the sampled regions as some farmers trade their labour with fellow farmers. Secondly, it allows seasonal and regional differences to be implicitly incorporated.

The undermentioned are the farm activities, costs and their respective labour requirements.

Planting – it takes about a day to plant a hectare of cotton in Nkomazi. Planting is done on the rows drawn by the tractors. Drawing lines by a tractor costs R120/ha. As explained above, the standard rates paid to casual labourers vary between R10-15/day in Nkomazi.

Weeding – the number of times weeding is done is influenced by the amount of rain in a particular year. In times of normal rains weeding can be done twice. It normally takes about 10 days for two labourers to complete weeding a hectare of cotton. Weeds do affect the quality of seed cotton and subsequently the price farmers get. Thus, weeding is one of the most critical chores in cotton production.

Spraying – as mentioned above, spraying is a laborious and gender sensitive task. As a result its wage rates are relatively higher than for other farming activities. In Nkomazi casual labourers earn R20/day for spraying while in Moutse they earn a relatively higher amount of R50/hectare for all the spraying done. Farmers currently spray a maximum of three times per growing season. The adoption of Bt cotton seed variety has reduced the number of spraying. Unfortunately the data does not allow quantification of the gain as a result of less spraying. Reduced chemical application saves labour. It normally takes a day for a labourer to spray a hectare of cotton.

Harvesting –In small-scale production, cotton harvesting is done by hand. Hand picked cotton is of higher quality than mechanically picked cotton. Hand picking

reduces the incidence of stains and impurities. Cotton harvesting is more labour intensive than any other cotton production activity. Cotton is usually harvested in April and it is usually around this time that the demand for labour is greatest. Harvesting needs to be done promptly before it rains as rain affects the quality of seed cotton negatively. As a result some households also use school children during this time. What still remains to be seen is the effects of enforcement of the Basic Conditions of Employment Act (1997) that, *inter alia*, prohibits the employment of children and forced labour.

The amount of money paid to casual labour for cotton harvesting varies but the standard rate prevailing in the sample region is fifty cents per kg. It is fairly challenging to determine the number of days it takes for a pair of labourers to harvest a hectare of cotton. Complicating this is that the number of workers hired for harvesting varies considerably amongst sample households. However, informal discussion with key informants as well as secondary sources indicates that it takes about three weeks for a pair of labourers to harvest a hectare of cotton. Several factors influence the duration of cotton harvesting; the size of the plant, age of harvesters, and amount of rainfall. In this study, labour costs for harvesting was computed on the basis of the total seed cotton produced per hectare multiplied by the prevailing harvest rate (R0.50/kg).

5.3.5 Pesticides

Pesticides are applied to control major pests such as bollworm complex and cotton aphids. At Nkomazi, 97% of cotton growers indicated the use of pesticides compared to 62% at Moutse. Monostem and Cypermethrin are the commonly used pesticides in the sample region. Applications of these pesticides depend on the level of infestation. Monostem is a systematic insecticide for the control of red, spiny and American Bollworm, aphids and red mites. Application takes place as soon as infestation is noted following regular inspection. Cypermethrin is aimed at controlling predominantly Bollworm and it is usually used during the period of peak flowering until boll spit (Ismael *et al*, 2001). These pesticides are sold in litres, are mixed with water and knapsacks are required for spraying. It cost R99.21 and R15.16/ha for spraying Cypermethrin and Monostem respectively.

In addition to the use of pesticides, some sample farmers also reduce pest populations by burning the cotton hay after harvest. This is done primarily to reduce pest populations for the following growing season. Cutting and burning of cotton hay is prevalent in Nkomazi and practiced by 97% of cotton growers in that region as opposed to only 5% in Moutse. The remaining percentage of the sample cotton growers leaves it on the field for grazing.

5.3.6 Transport costs

Ginners usually provide transport for bales produced when there are sufficient bales of seed cotton. For the production season under review, sample cotton growers in Moutse indicated that they have used their own transport to the gin (average distance is 45Km). In Nkomazi farmers transport their bales to the depot that on average is approximately 10km from the farmers' fields. Contrary to expectation, transport cost is usually charged per bale delivered instead of kilometres travelled. The transport costs that sample households pay vary considerably mainly because individual households do negotiate their own transport costs with transport owners. In Nkomazi the average price per bale is R24 while it is R16 in Moutse.

5.3.7 Picking cost

Other costs that farmers incur related to picking cost involve the plastic and bale bags that they use when harvesting. These bags are supplied by ginners. Plastic bags cost R1.50 and farmers use only 3 bags per hectare. Bale bags cost R40/bag, but farmers get refunded after harvest when they return them. Alternatively, farmers without cash to purchase bale bags get them on loan on condition that they have seed cotton ready to be harvested.

5.4 Results and Discussion

Table 5.1 highlights a concise measure of the profitability analysis showing both average revenue and costs. Moutse sample cotton growers obtained an average yield of 973kg/ha which is 44% higher than the Nkomazi average yield of 549kg/ha. In bale terms, seed cotton produced translates into 5 and 3 bales in

Moutse and Nkomazi respectively. Nkomazi is regarded as a more suitable region for cotton production than Moutse. Reasons that can be advanced for this paradox is that, firstly, observed relative low yields in Nkomazi can be attributed probably to unfavourable climatic conditions in the production year under review. Secondly, the application of fertiliser in Moutse has probably boosted cotton production. It appears that sample cotton growers produced seed cotton of similar quality/grade (HA grade) as represented by the average price per unit (R3.65/kg) received. Moutse sample cotton growers' gross income averaged R3550/ha compared to an average of R2004/ha for Nkomazi cotton growers.

The mean total operating cost is R2480/ha for Moutse and R1441/ha for Nkomazi. Costs were divided into two components namely, pre-harvest, and harvest and marketing costs. Pre-harvest costs constitute about 76% of the total operating costs. Labour costs were calculated using the maximum rate prevailing in the region. The reason is that, firstly, hired labourers are aware of the prevailing rates that exist in their respective regions and as such are not willing to settle for lower rates. Secondly, sample farmers associate maximum rates with better quality work.

Table 5.1 Profitability Analysis of Cotton Production in Moutse and Nkomazi, 2001/02

	Moutse				Nkomazi			
Description	Unit	Cost/unit (R)	Quantity	Value or Cost/ha (R)	Unit	Cost/unit (R)	Quantity	Value or Cost/ha (R)
Gross Income	Kg	3.65	973	3551	kg	3.65	549	2004
ALLOCATED COSTS								
Pre Harvest								
Seeds (Bollgard)	Kg	35	10	353	kg	35	5	175
Ploughing	Ha	300	1	300	ha	300	1	300
Discing (Drawing lines)	Ha	200	1	200	ha	120	1	120
Planting	Ha	200	1	200	ha	15	2	30
Fertiliser (2:3:1)	Kg	105	2	210				0
LAN	Kg	95	2	190				0
Weeding	Ha	150	2	300	ha	150	2	300
Herbicides (Monostem and Cypermethrin)	L	105.27	1	105	L	105.27	1	105
Spraying	Ha	50	1	50	ha	20	3	60
Total Pre-Harvest Costs/Ha				1909				1090
Harvest and Marketing Costs								
Harvesting	Kg	0.5	973	487	kg	0.5	549	275
Plastic bags	Bag	1.5	3	5		1.5	3	5
Transport	Bales	16	5	80	bales	24	3	72
Total Harvest Costs/Ha				571				351
Total Allocated Costs/Ha				2480				1441
GROSS MARGIN/Ha				1072				563

Note: 1 bale = 200kg

On aggregate, average costs of production per hectare in Moutse are 75% higher relative to the costs of production in Nkomazi. Differences in costs of production between the sample regions lie largely in the pre-harvest activities and methods applied. For instance, the cost of planting in Moutse region is almost seven times higher than the planting cost in Nkomazi. Manual planting can significantly reduce the cost of production and subsequently increase the profitability of cotton production. Furthermore, manual labour has an additional advantage of reducing the amount of seeds required per unit. Cost of seeds in Moutse is double that in Nkomazi.

Per unit costs of production (i.e. total enterprise cost divided by the average yield) for sample Moutse cotton growers amount to R2.55/kg compared to R2.62/kg for Nkomazi sample cotton growers. At the current seed cotton price received, for every kg of seed cotton produced sample cotton growers make a gross margin of R1.10/kg and R1.03/kg in Moutse and Nkomazi respectively. The gross margin/ha for sample cotton growers is R1 072/ha and R563/ha in Moutse and Nkomazi respectively. The average gross margin/ha in the sample region is R818.

According to Morris and Meek (1980: 65) monetary values must be used with caution. Numerical values obtained in financial/economic analysis should be seen principally as a basis for ranking strategies, regions etc, and not as representing the actual benefit which will be achieved under all circumstances.

Three main critical variables that influence the profitability of cotton production are production levels, costs, technology available and price as influenced by the quality of seed cotton produced. The next section will explore the effects of a change in production levels and prices of seed cotton to the GM.

5.5 Sensitivity Analysis

The results presented in Table 5.1 are subject to debate. As mentioned previously, Moutse is regarded as a marginal cotton producing area with a low production potential compared to Nkomazi. Under normal circumstances/years a hectare of cotton produces 1000kg and 1800kg of seed cotton in Moutse and Nkomazi respectively (Anthony, 2003: Macaskill, 2004). Thus, the observed seed cotton

production from the survey is lower and contrary to the general knowledge and expectations. Under normal circumstances therefore sample cotton growers in Moutse would have realised a gross margin of R1 157/ha compared to R4 359/ha in Nkomazi.

Using production data from the normal years, sensitivity analysis will test the robustness of smallholder profitability indicators to changes in key variable parameters. The results of the sensitivity analysis will be reported mainly for changes in the production level per hectare and the quality of, and therefore the price of seed cotton produced. These variables are responsive, *inter alia*, to weather related risk and farmers' management capabilities. Sensitivity analysis will be performed under the following scenarios:

1. Dry weather conditions (drought), holding price and pre-harvest costs constant (bad year)
2. Normal weather conditions holding price and pre-harvest costs constant (good year).
3. Dry weather conditions accompanied with bad crop management

An optimal way to perform the sensitivity analysis would have been to perform a regression analysis of factors affecting production levels, for example rainfall and temperature. A regression model of time series data of production given rainfall and temperature could have given an indication of the actual level of production changes over changes in rainfall and temperature. However, lack of time series data on small-scale production levels precluded the performance of the analysis.

Therefore, the results of the sensitivity analysis for scenario 1 and 2 are reported with respect to $\pm 50\%$ change in cotton yield holding pre-harvest costs and yield price constant. Cotton prices are fixed by Cotton South Africa and vary according to grades. Figure 5.1 and 5.2 show changes in GM to changes in production levels and quality of seed cotton respectively. In bad years, GM begins to fall below zero when production falls by 40% in Moutse. The magnitude of the loss is R71/ha in Moutse. The size of the loss could be minimised by reducing the costs of production that are relatively higher in Moutse.

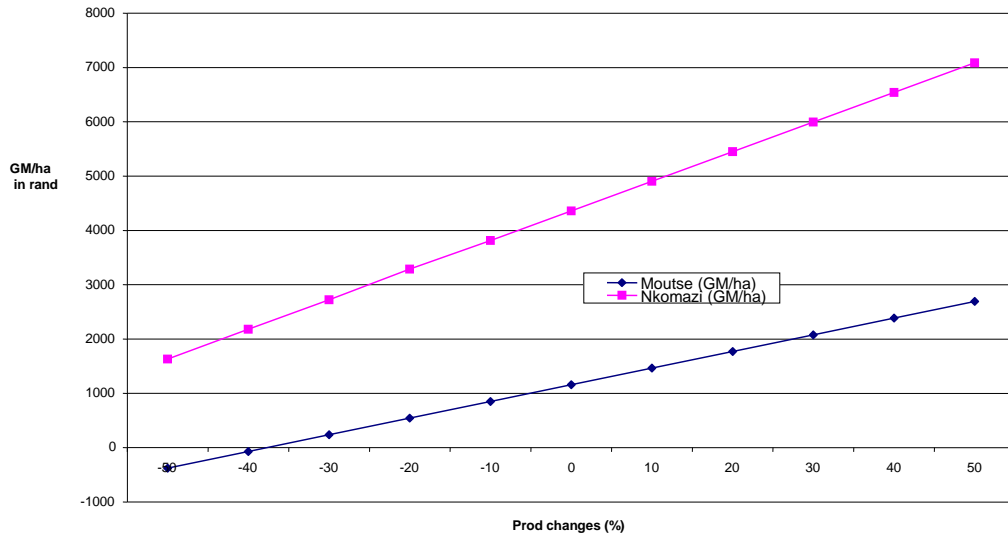


Figure 5.1 Changes in Gross Margin as a Result of Changes in Production Levels

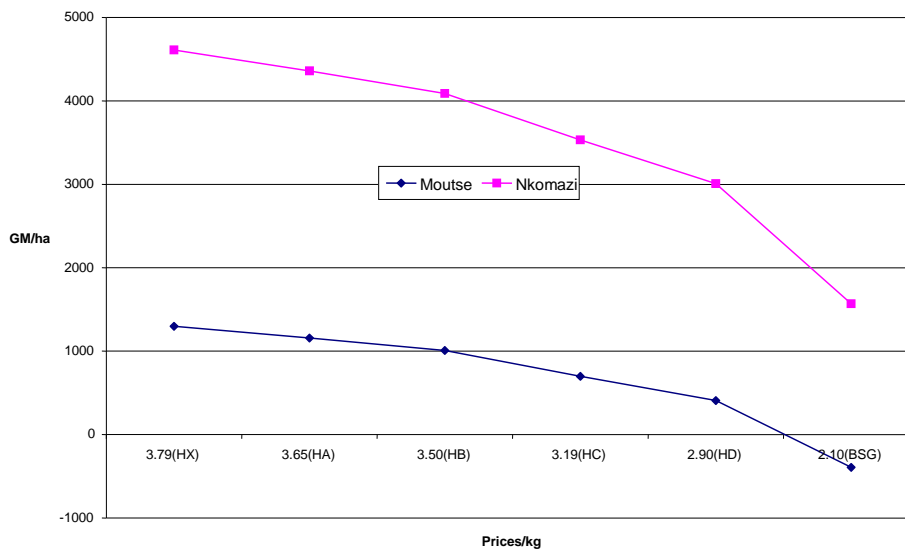


Figure 5.2 Changes in Gross Margin as a Result of Changes in Prices of Seed Cotton

In the survey year, sample cotton growers produced cotton of grade HA (R3.65/kg). The quality of seed cotton determines the price ginners pay to the farmers. Results of Scenario 3 shown in Figure 5.2 shows effects of seed cotton quality on GM, holding both yield and operating cost constant. In Moutse, GM falls below zero when sample cotton growers produce cotton of grade BSG (below standard grade). Thus, producing cotton of a higher quality is imperative particularly under dryland conditions where production is erratic.

5.6 Break-Even Analysis (BEA)

BEA is a financial analysis tool that provides one of the most useful decision models for financial management decision. According to Kannapiran (2001) it facilitates decision making in the short term, although long term and strategic decisions can also be based on BEA. In addition, it can assist in making investment decisions that are both technically and financially sound. Break-even point is simply the level of sales that a farm business must generate to achieve zero profit and / or zero loss. That is, the break even point units indicate the level of sales that are required to cover costs. It is important, however, to realise that a farm business will not necessarily produce a product just because it is expected to break even. A certain level of profitability is desired. This level of productivity will be at least the opportunity cost involved in using the available resources for the production of the product concerned.

There are various basic assumptions used in BEA and some of the assumptions are mentioned below

- Costs can be divided into fixed and variable costs
- Total variable costs are proportional to volume
- Sales and production are equal
- The relationship of sales and costs is linear over the relevant range
- The sale price does not change over the relevant range
- Total fixed costs remain the same over the relevant range

At break-even point, total revenue (TR) is equal to total costs (TC)

$$TR=TC \quad (1)$$

$$TR=P \times Q \quad (2)$$

$$TC=FC + VC \times Q \quad (3)$$

$$P \times Q= FC + (VC \times Q) \quad (4)$$

Where Q is the quantity produced and sold and P is the sales price per unit produced or sold. FC is the fixed costs for the farm enterprise and VC is the variable cost per unit of production or sale. Equation 4 can be articulated in a variety of ways to evaluate choices for strategic and operational decision making in an enterprise. To

determine production decisions, equation 4 need to be solved for Q and it yields the following:

$$Q = FC/(P - VC) \quad (5)$$

Sample farmers have limited FC applicable to their farming operation. The FC faced by a significant number of small sample cotton growers is merely the amount of loan (plus interest) borrowed from the Land Bank. The average amount of loan is R800/ha in Nkomazi and R1000/ha in Moutse. Other information used for the computation of break-even point is the one derived from Table 5.1.

Table 5.2 Results of Break-Even Analysis to Determine Break-Even yields per ha for Emerging Cotton Producers in Moutse and Nkomazi, 2001/02 (Kg or bales)

P/kg (per bale)	3.79 (758)	3.65 (730)	3.50 (700)	3.19 (638)	2.90 (580)
Moutse	952 (5)	1073 (5)	1242 (6)	1844 (9)	3371 (17)
Nkomazi	807 (4)	917 (5)	1073 (5)	1656 (8)	3371 (17)
Average	880 (5)	995 (5)	1158 (6)	1750 (9)	3371 (7)

*Figures in parenthesis are in bale terms while those outside are in kilograms

Table 5.2 above reflects the results of the BEA of the emerging cotton producers in the study zones. Using the formula explained earlier, for example, when price is set at 3.65/kg (i.e. farmers produce seed cotton of grade HA) the break-even quantity for Moutse and Nkomazi cotton growers is estimated to be 1073kg and 917kg per hectare of seed cotton respectively. This translates into 5 bales/ha. This situation is further illustrated in Figure 5.3a and 5.3b. In essence, the break-even point indicates the level of sales required to cover the costs. At this point no profit is made and no loss is incurred. An important observation to be noted from Table 5.2 is that when seed cotton price declines large quantities of seed cotton have to be produced to break-even, *ceteris paribus*.

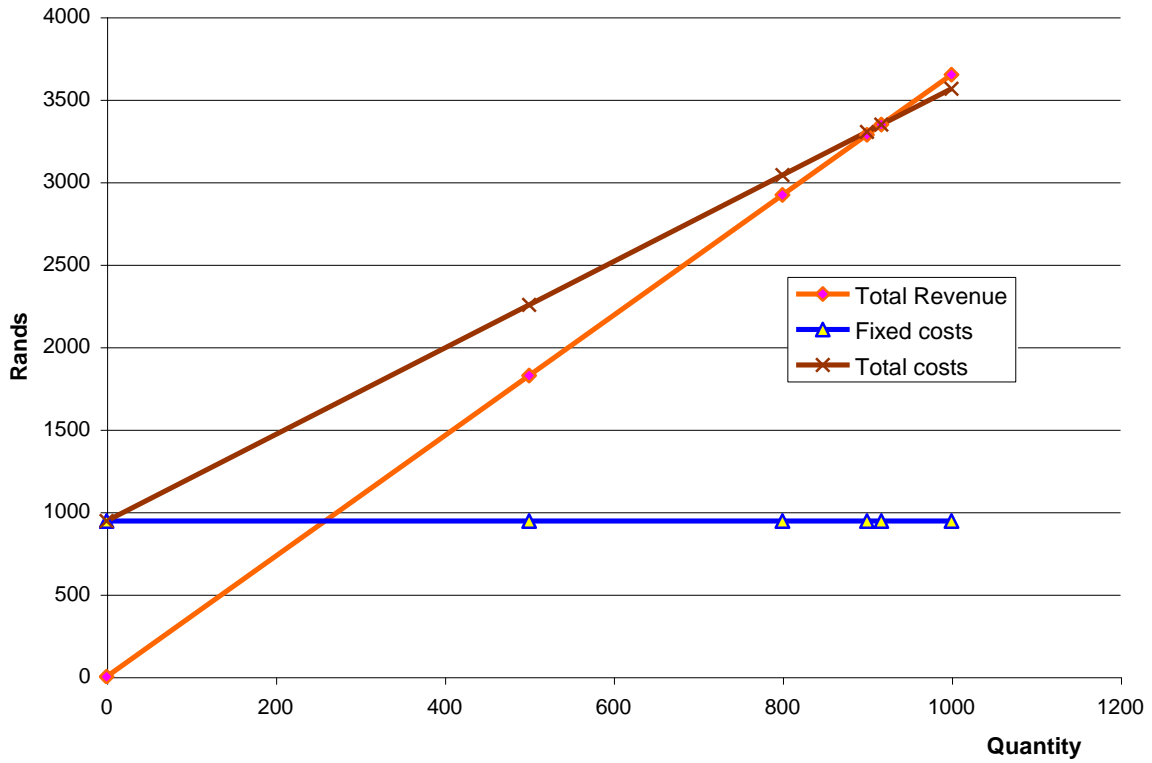


Figure 5.3a: Break-Even Chart - Nkomazi

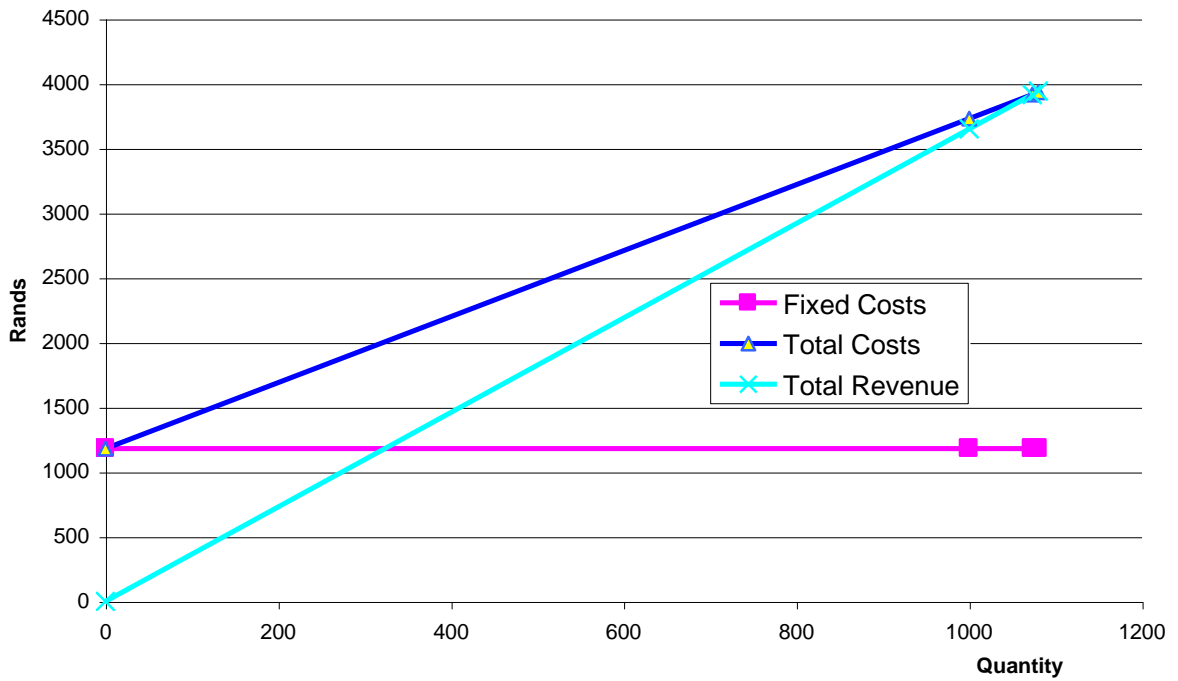


Figure 5.3b Break-Even Chart - Moutse

Farmers were asked to indicate the amount of money that they have saved from cotton sales. Respectively, 89% and 87% of the sample cotton growers in Moutse and Nkomazi indicated to have saved the money in the bank. The average amount of money saved is R1 248/ha and R480/ha in Moutse and Nkomazi respectively. These results are puzzling considering that sample cotton growers appear to be operating below the break-even point and it is probably an indication of the non-repayment culture reported by Delta Pine and Land Bank². If this is true, further studies need to be conducted to identify characteristics of defaulting farmers and evaluate strategies to overcome the problem.

It is important to note from Table 5.2 that the break-even point is not static. In many instances, the selling price, fixed costs and variable costs will not remain constant resulting in a change in the break-even. So a break-even cannot be calculated only once. It should be calculated on a regular basis to reflect changes in costs and prices and in order to maintain profitability or make adjustment in the product line.

Finally, the cotton industry envisages establishing new cotton small-scale producers. In addition, Da Gama Textiles, a leading textile manufacturer based in the Eastern Cape, is examining the feasibility of undertaking cotton production in four districts in the Eastern Cape Province, namely Addo, Cradock, Qamata and Tyefu. BEA is one of the most common tools used in evaluating the economic feasibility of a new enterprise or venture. In most instances, success takes time. Many new enterprises and products actually operate at a loss in the early stages of development. Knowing the price or volume necessary to break-even is critical especially in evaluating the time frame in which losses are permissible.

5.7 Major Factors Limiting Cotton Production

The cotton industry and policy makers are currently searching for feasible strategies to increase the number of cotton producers and the quantity produced particularly by smallholder farmers. To help inform this process, one of the relevant questions to ask is why some regions or smallholders within a region get significantly higher yields

² Important to note is that Land Bank does not take into account the opportunity cost of family labour in their lending operations

than others as shown in the previous section. Table 5.3 highlights some of the major constraints limiting cotton production as seen through the eyes of the surveyed farmers. It is important to remember that some of the constraints outlined here are additional to the agronomic constraints mentioned in chapter three.

Table 5.3 Constraints to Cotton Production expressed by Sample Farmers

	Moutse N=40	Nkomazi N=98	Average
	%		
Lack of farming equipment	28	2	15
Credit	10	8	9
Transport	10	-	5
Insufficient rainfall (drought)	33	82	57
Insects, pests and diseases	15	8	12
Illiteracy	5	-	3

Table 5.3 shows that limiting factors vary by regions, but the most pressing constraint limiting cotton production in both regions seems to be insufficient rainfall (drought) as expressed by a larger proportion of the sample cotton growers (57%). Insufficient rainfall has a devastating consequence as it leads, *inter alia*, to erratic, low and sometimes zero production. Lack of equipment is the second largest constraint limiting cotton production in Moutse as indicated by 28% of sample cotton growers. The commonly stated lack of equipment is that of tractors. Smallholders with relatively high yields may have reached this yield because they have access to production inputs in a timely fashion, while others do not. The cotton industry and the government may want to target programs towards assets or inputs where farmers indicate problems, thereby increasing yields and total output without necessarily land expansion.

A striking constraint noticeable in Moutse is the illiteracy problem. This result is puzzling as one would have expected Nkomazi farmers to be more aware of illiteracy problems as the majority of respondents (44%) in that region had no formal schooling compared to 36% of Moutse farmers. Informal discussion with some farmers in

Nkomazi revealed that school children do assist their parents (farmers) with written instructions or by reading the agricultural information. In addition, some farmers in Nkomazi prefer to receive written agricultural information for future references. The illiteracy problem may, *inter alia*, imply huge difficulties in pesticides application. With an inability to write and read, problems with the mixing of pesticides and calibration of sprayers for different pesticides cause concern about the real efficacy and effectiveness of pesticides application.

Through the eyes of MADC, commercialisation of small-scale cotton production is limited by small farm sizes that are not viable for sustainable commercial production. However, it appears that land expansion issues need to be preceded with avenues for increasing the productivity of land currently under production. When dealing with the land expansion issue, it is important to evaluate whether smallholders who wish to increase their area planted in cotton have access to additional land. Another important part of the land question is to better understand how easy it is for smallholders to gain access to additional land in the respective regions.

5.8 Concluding remarks

This section analysed the profitability of the small-scale cotton production in the two study zones in Mpumalanga. The study was conducted within the GM and BEA framework. Contrary to expectations, higher GM was achieved in Moutse compared to Nkomazi, despite the relatively higher costs of production experienced in Moutse. It is evident that producer profitability is a function of at least four things: the technology available (especially seed technology), the quality and quantity of seed cotton farmers produce, the services that farmers receive and the climatic weather conditions. In addition, to GM analysis BEA was applied to determine the level of sales that a hectare of cotton farm business must generate to break-even. Break-even quantity increases when seed cotton price declines. To break even, Higher quantities of seed cotton are required in Moutse to break even compared to Nkomazi at various level of prices.

The projected long-term decline in the cotton world price indicates the need for SA producers to focus on to achieve a reduction in the avoidable cost of production. This

focuses attention on agricultural research, the extension system and coordinating the supply channel for credit, inputs and output in such a way that makes cotton profitable for both farmers and firms in the long run. Furthermore, high productivity is essential to survival when prices are low. It is very unlikely that a low-input, low yield approach to cotton production will allow the SA cotton industry to flourish. Profits earned from cotton production have the potential to improve the standard of living of small farmers. From a societal perspective, therefore, the government should have a strong incentive to see overall production and productivity increase. This renders the provision of irrigation facilities imperative. The growing of cotton under irrigation will provide farmers with much improved and more stable yields per hectare, which in turn enhances profitability. It reduces the risk of unfavourable climatic conditions, thereby contributing to sustainability.

Finally, product prices have a large influence on the viability of small and emerging farmers including cotton farmers. It is vitally necessary for South Africa and other developing countries (e.g. Brazil, West Africa *etc*) to persevere with pressure to create a more level playing field the world agricultural trade.

CHARACTERISTICS OF POTENTIALLY SUCCESSFUL AND UNSUCCESSFUL EMERGING COMMERCIAL COTTON FARMERS

“Every human being is like a falling snowflake. Many will be subjected to the same economic temperature and social humidity and to the same political impurities but each is unique as buffeted by the turbulence of life experience “(Ray, 1993: 350).

6.1 Introduction

Efforts over the past years to transform small-scale agriculture into successful commercial operators seem not to have been successful. Current agrarian reforms, particularly LRAD, aims, *inter alia*, to create a successful black commercial farmer class. Thus, information describing farmers’ characteristics and their attributes with respect to their farming potential will promote the design, farmer selection and development, and implementation of appropriate policies. This exploratory study attempts to identify a set of factors that identify potential successful farmer from unsuccessful ones. The purpose of this chapter is to describe a typology of sample households in terms of their farming potential. Results could help to improve the ability of small business farming enterprises to develop and prosper in an increasingly competitive and complex world. It is based on the recognition that entrepreneurship has a critical role to play in the development of the South African agricultural economy. Success versus failure prediction research also benefits existing farmers, those who assist, train and advise them, those who provide capital for their ventures, suppliers and public policy makers. It is envisaged that the findings will help promote the trend towards emerging entrepreneurship in South Africa.

The chapter starts with an overview of the past and current approaches to small-scale farmers' development in South Africa. The basic premise of these approaches is the assumption that everybody is a potential commercial farmer. This is followed by a discussion on beneficiary selection and farmer settlement. The chapter proceeds with a literature review of the attributes and characteristics of a potential successful entrepreneur. Section five introduces cluster analysis technique which is a method applied in generating various farmer groupings according to their success potential. This is followed by a discussion of results of cluster analysis and implications thereof. The last section concludes the chapter.

6.2 Approaches to Small-Scale Farmer Development: A cursory

Overview

Approaches to small-scale farmer development in South Africa are well documented in Kirsten (1994) as well as Van Rooyen and Nene (1996). The concept of small-scale farming as a major development strategy was first seriously promoted by the Tomlinson Commission in the mid-fifties of the last century. Tomlinson's major recommendation required the planning of farm areas in economic units and the provision of support services and infrastructure. This recommendation amounted to a transformation of the homelands agriculture to which the government of that time was not ready to accede.

The government's reaction to the Tomlinson Commission report was occupied by ideological considerations rather than with any formula for successful farming in the homelands. In practice, the Tomlinson strategy was largely reduced to rural land use planning, fencing and the provision of some infrastructure i.e. betterment planning.

The next phase in small-scale farming development in the homeland areas was promoted by the establishment of the Bantu Investment Corporation in the 1970s. This introduced large-scale projects and it was argued that expatriate management and modern technology were required to modernise farming in the homelands. This approach concentrated on technology transfer through greater emphasis on extension, irrigation development and mechanisation and intensive agriculture.

According to Kirsten (1994), the origin of this approach to agriculture was the virtual absence of commercial agriculture in the homeland which was incorrectly attributed to lack of entrepreneurial and managerial ability amongst black farmers.

In the late 1970s, there was also an introduction of farmer settlement projects. This approach was adopted in order to settle selected black farmers on mini farms under paternalistic control. The main objective that evolved over time was to guide selected farmers towards becoming full time small-scale commercial producers. On these types of schemes farmers were supported by a suite of services (e.g. input supply, credit, mechanisation and marketing). Settlement schemes are currently found in the outgrower schemes concept. An example of outgrower schemes is found in the sugar and cotton industries. Kirsten, Van Zyl and Van Rooyen (1994) argue that this strategy failed to promote the establishment of an independent class of small-scale farmers while it constituted high investment costs with a relative low profit and development impact.

During the mid-eighties, the Development Bank of Southern Africa introduced a different strategy for small-scale farmer development through the Farmer Support Programme (FSP) concept. The objective of the FSP was to promote structural change away from subsistence agricultural production to commercial production. This programme was based on the premise that this change can be achieved by supplying comprehensive agricultural support services to emerging farmers in selected target areas. Although emerging farmers were initially identified as the target group, this was later relaxed to basically include all rural households making a living from cultivating the soil or rearing animals. The essence of the programme was that it should through allowing economic forces to operate and serve as a spontaneous means of selecting the commercial farmers.

Small-scale farming in terms of the above mentioned approaches was largely promoted within the homeland context, but this concept was never introduced under fully supportive conditions such as those under which large scale farming was promoted in the commercial areas. This situation is likely to change as the small-

scale farming concept is viewed as relevant by government policies. The most notable of this is the land reform programme initiated in 1995 under a distinct component of land reform known as the Settlement and Land Acquisition Grant (SLAG). LRAD replaced the SLAG programme that had been in existence between 1995-1999. LRAD was, *inter alia*, designed to cater for projects to assist black farmers get into commercial farming. In addition, a number of initiatives were also launched to facilitate links between emerging farmers and agribusiness entities such as retailers and exporters.

Although various efforts to establish black commercial farmers have been noted particularly in the past 10 years a lot still needs to be done in terms of achieving the vision of a united and prosperous agricultural sector. The challenge for South Africa is thus to ensure that black farmers who obtain land under the land redistribution programme do have something to sell, do have markets and do make a decent living and income. This is absolutely necessary for a successful land reform programme. It is important to note that, not only access to land is needed but also access to other resources and support services such as water, capital and agro-support services within a friendly policy environment.

With all the above in mind, however, it appears that both current and past initiatives of enabling black South Africans to become commercial farmers are based on an incorrect assumption that all black farmers are potential successful commercial farmers. From a theoretical point of view, the next sections focus on beneficiaries' selection and highlight some characteristics or attributes of a potential successful farmer. It is hoped that these attributes can be applied as selection criteria by government and non-governmental and financial institutions in agricultural and rural development in South Africa.

6.3 Beneficiary Selection and Farmer Settlement: Implication for Land Reform

One of the policy reforms in South Africa aimed, *inter alia*, at redressing the imbalances of the past is the implementation of the land reform programme. Land reform has traditionally had two objectives: equity and productivity (Groenewald, 2003). The challenge to be met is to arrange land and agricultural matters in such a way that both equity and productivity are improved thereby contributing to the welfare of the participants. It is important to note that access to farmland is a necessary but certainly not a sufficient condition in addressing poverty, malnutrition and accumulation of welfare.

The South African land reform programme is market driven based on a willing seller-willing buyer principle. Under this system the market does the selection of beneficiaries. However, in view of the shortages of resources and the varied need that exists Van Rooyen and Njobe-Mbuli (1998) propose a set of fundamental principles and critical factors that should be taken into consideration in the selection of beneficiaries in so far as providing access to land and farming opportunities are concerned. They are broken down into three categories, namely

- Victimisation and disempowerment
- Poverty and need
- Productivity

According to Lewis (1954), success in new agricultural development and settlement depends on seven conditions;

- Choosing the right place
- Choosing the right settlers
- Proper physical preparation of the site
- Settler's capital
- Organisation of group activities
- The land area per settler
- Condition of tenure

Echoing Lewis (1954), Deininger (1999) argues that negotiated land reform requires beneficiaries to take considerable initiative and perform tasks such as group formation based on similar interest, selection of a viable farm model to the conditions of a specific farm, identification of the productive value of at least a number of farms available for sale, negotiation of a purchase price with the farm owner, arrangement for credit to finance the land and capital requirements that are not covered by the purchase grant, formulation of a strategy to establish needed on-farm infrastructure and eventually cope with the challenges and risks associated with sustaining an economically viable farm enterprise.

Some agrarian reform opponents argue that self-selection of beneficiaries open the doors to opportunists who are not in need and have nothing to do with agrarian reform. A study by Aliber, Cross, Randela, Scott and Mokoena (2003) revealed that some “beneficiaries” applied for LRAD grants just to inflate the size of the grant to the benefit of other project members. Additionally, as beneficiaries have nothing to lose in case of failure, the process of self selection may attract people that are not familiar with agricultural work. According to Deininger (1999), unprepared and inexperienced beneficiaries undermine the success of many settlements. A counter argument by Van Rooyen and Njobe-Mbuli (1998) to this criticism is that it is very often difficult to detect what impact previous farming experience can have on one’s own managerial and entrepreneurial ability to farm successfully.

Van Rooyen and Njobe-Mbuli (1998) proposed beneficiaries’ selection criteria to be set at the national level and applied at the local level. In South Africa, the selection criteria/requirements at project level differs greatly from project to project, but still operates within the national policy framework. Figure 6.1 below highlights some of the criteria applied to select beneficiaries (190) participating in share equity schemes in some of South Africa’s provinces (Mini *et al*, 2004). Of these criteria, farming knowledge/experience is a notable criterion that has also been applied internationally. Farming knowledge was the least important criterion used to select beneficiaries participating in the share equity schemes while identity document was the most important criterion. In some schemes, nothing was required in joining share equity

schemes. What still remains to be seen is the success of share equity schemes based on the criteria listed in Figure 6.1 below.

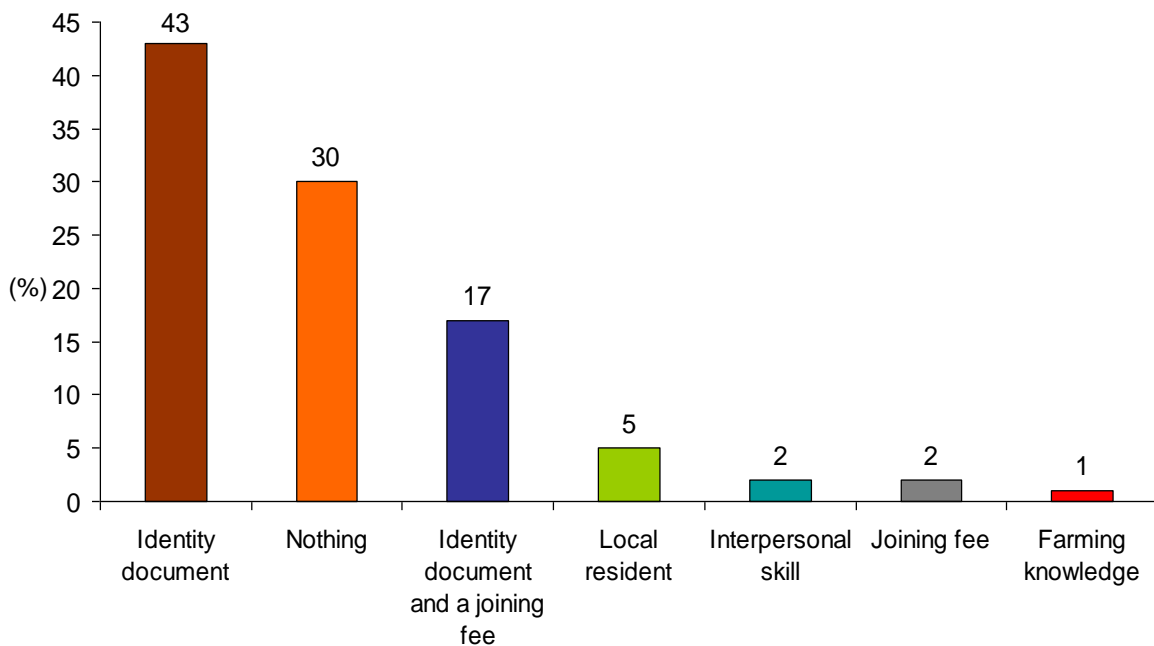


Figure 6.1: Major Requirements for Participating in Share Equity Scheme
Source: Mini et al (2004)

Farmer settlement follows on beneficiaries' selection. Selection of beneficiaries is closely linked to tenure policy. No settlement programme can succeed without a clear tenure policy. There seem to be a fallacy in South Africa that private ownership of land is a panacea. It is not necessary for a family to own land on which they farm as a private property. Negotiated land reform is a complement, rather than a substitute for other forms of gaining access to land, especially land rentals. Tenancy is another form of occupation which is extensively used in some countries such as USA, Belgium, France and Holland. This system ensures that those who are unsuccessful are moved out of the farming while the successful entrepreneurs will strengthen their position (Van Rooyen, 1998). It is important that tenure arrangement should ensure security for land use as well as the tradability of land rights (Groenewald, 1998).

Tenancy should be understood as a means for beneficiaries to accumulate experience and start up capital. Moving up the "ladder of tenure" (as Groenewald, 1998 puts it) as has been applied in the past in irrigation settlement schemes, offers

valuable lessons. Under this system, settlers started on government schemes on a trial basis and the farmers with the acumen, energy, ability or perseverance to be successful irrigators were given an option to buy and subsequently settle on the land. Groenewald (1998) proposed that new settlement should therefore be based on rentals rather than outright purchase of land, particularly where government funds are involved.

Finally, newly settled farmers as beneficiaries of land reform have to cope with all the problems faced by existing, mostly white commercial farmers; they also have additional handicaps stemming from their more limited resource base, their more limited experience of commercial farming and low socio-economic status (Groenewald, 2003). This emphasises the need for post-settlement support in the form of research, extension, market access, education and training etc. Designing of these support programmes should be sensitive to the non-homogeneity of the black rural community; differentiation in farmers' categories will be dealt with in subsequent sections.

6.4 Characteristics and Attributes of a Potential Successful Commercial Farmer (Entrepreneur): Theoretical Underpinnings

“n Plaas maak jou nie ‘n boer nie” (Raath, 2003)

There is a wealth of literature that focuses on what makes an entrepreneur or enterprise successful. Nicholson and Bembridge (1991) argue that one of the theoretical frameworks relevant to the study of the way in which the study of farmers and their operation is approached is the theory of entrepreneurship. This theory, *inter alia*, postulates that commercial farmers may be regarded as entrepreneurs as well as innovators and early adopters of innovation, and possibly initiators.

In order to understand why some individuals become entrepreneurs and some entrepreneurs are relatively more successful than others, Ray (1993) and Pretoria News (2004) indicate that there are three key elements that must be understood or

addressed; the entrepreneur's personality or attributes, the entrepreneur's background and experience, and the entrepreneur's skills and knowledge. Ghosh, Kim and Meng (1993) group this body of literature into two broad approaches – descriptive and prescriptive. The descriptive approach seeks to describe the characteristics or attributes entrepreneurs will presumably possess while the prescriptive approach seeks to prescribe factors that contribute to a successful enterprise. These two approaches will now receive attention.

6.4.1 Descriptive Approach

Literature variously defined an entrepreneur as an innovator, a risk taker and as an opportunity maximiser (Ghosh *et al*, 1993). For an entrepreneur to be successful, Nicholson and Bembridge (1991), citing Tapson (1984), believed that the human element is a major factor in the realisation of agricultural potential. Nicholson and Bembridge (1991), Ghosh *et al* (1993), Ray (1993), Osborne (1995), Luk (1996), and Nell (1999), in summarising research done on this topic concluded that the most important characteristics attributed to persons exhibiting entrepreneurial behaviour and subsequently a successful business are:

- Internal locus of control
- The need for achievement
- Creativeness
- Risk taking
- Independence and autonomy
- Assertive ability
- Initiative
- Innovativeness
- Optimism
- Commitment
- Persistence to work hard (perseverance)
- Flexibility
- Leadership
- Positive self image
- Resourcefulness

In addition to the above attributes, Ghosh *et al* (1991), citing Graham (1992), Plotkin (1990) and Niehouse (1986) argue that for an entrepreneur to be successful, (s)he must also possess the following traits: ability to persuade others, patience, drive, ability to co-operate, honesty and integrity, trustworthiness, willingness and ability to adapt readily to change, timing, luck, “heart”, charisma, good interpersonal skills, communication ability and technical knowledge. Huck and McEwen (1991) believed that local reputation and prior experience in business and political affiliation are key to becoming a successful entrepreneur.

Finally, the most striking attribute for a successful enterprise advanced by Ray (1993) is physical appearance. He argues that physical attractive people find it easier to meet people (networking), raise money (resources) and sell their product (customer). Similarly, people who are very likeable and personable find the road to entrepreneurial success to be easier.

6.4.2 Prescriptive Approach

This approach seeks to prescribe factors that contribute to the success of an enterprise. Many studies (de Wet, Groenewald and Boshoff, 1992; Ray, 1993; and Ghosh *et al*, 1993, citing Evans, 1986; Wood, 1989 and Flahvin, 1985) state that managerial skills and behaviour constitute the main determining factor that causes a business to prosper or fail. This is supported by a similar study by Hunk and McEwen (1991), which identified the following competencies as vital to the success of a business: Management, planning, budgeting and marketing. Specific competencies within the areas considered most important were maintaining financial records, financial reporting system, planning goals and objectives.

Duncan (1991), cited by Ghosh *et al* (1993), asserts that a key ingredient for business success is the skills of the entrepreneur who can identify a market niche and develop a venture for that niche. Thus, the ability to identify and focus on one or few market niches is critical for business success. Ghosh *et al* (1993) argue furthermore that

written business plans and the development of new products are important factors for a successful business.

A study by Steiner and Solem (1988) presented a successful entrepreneur as someone likely to have the characteristics of access to adequate financial services and competitive advantage based on costs and quality. Access to finance has also been implicitly acknowledged by Jordaan (2003) as an important factor towards the success of a business. Gaskill and Hayland (1989) identified four keys to a successful business: A study of the competition, measurement of performance, not becoming too comfortable with progress, market and financial intelligence. Finally, de Wet *et al* (1992), Felsentein and Schwartz (1993) and Ghosh *et al* (1993) agree that the chief factors determining the success of the business include, managerial background and experience, satisfactory government support and good labour relations.

It should, however, be acknowledged that the decision to become an entrepreneur is complex and the absence of one or more variables may or may not be sufficient to deter one from becoming an entrepreneur. In reality, the decision to become an entrepreneur is probably a complex interaction between attributes and the situation faced by the individual.

6.5 Cluster Analysis Technique

Some previous studies (e.g. Bembridge, 1986; Nicholson and Bembridge, 1991 and Nel, Botha and Groenewald, 1988) on the identification of the attributes and characteristics of potential successful (progressive) and unsuccessful farmers relied primarily on the prior knowledge concerning farmers on the part of extension officers. Insufficient knowledge about the sample farmers precluded the adoption of such an approach in this study partly because of a relatively large sample size. In addition, success means different things to different people.

Because of this limitation, cluster analysis technique was adopted to achieve the objective of this chapter. Its main advantage is that it can suggest, based on complex input, groupings that would not otherwise be apparent. SPSS-South Africa (2001) argues that cluster analysis is an exploratory data method and therefore it is a sure recipe for disappointment to expect a definitive solution. There are no priori reasons

for expecting sample households to be arranged in distinct clusters or groupings with particular sets of homogenous characteristics. It does not provide a perfect, seamless and timeless solution. Yet cluster analysis can suggest useful ways of grouping the data. This technique is based on distances derived from the measures taken on the observation and these measures are typically interval scale.

There are two types of clustering method, hierarchical and non-hierarchical (Apili, Makhura and Kirsten, 1999; SPSS-SA, 2001). The hierarchical method calculates the distance between the starting points, combines the closest points into a group and continues to allocate points to the nearest group. The non-hierarchical method, in contrast, assigns objects on the basis of a specified number of clusters to generate the best cluster solution. When clustering many observations non-hierarchical analysis is usually the method of choice. However, the choice is typically governed by the type of data one is working with and what makes the most conceptual sense for the clusters one is trying to form. Furthermore, the typology must not generate an unmanageable number of types and as a result the non-hierarchical clustering method was applied in this study.

6.6 Empirical Findings and Results

The first step was to lay down criteria for success. Although these criteria are certainly necessary, they are not sufficient for success as commercial farmers/entrepreneurs. These methods can nevertheless be used to predict farmers' likelihood of success.

There is no generally accepted list of variables for use in forecasting business success or failure (Lussier, 1995). The basic premise of the literature reported in the previous section is that entrepreneurial personality is important in determining success or failure of the business, but as pointed out by Ray (1993), no ideal-type personality or marginal set of attributes guarantees success for a business.

The theoretical framework outlined in this chapter's introduction suggests that variables that depict the entrepreneurial skills of the households are likely to provide the best basis for a classification that captures various households' entrepreneurial

and behavioural patterns. Five main variables were selected for the generation of clusters, namely leadership, creativity, motivation, need for achievement of goals and attitude to risk. With the exception of the variable 'attitude to risk', other variables were finally used to generate clusters. This variable had a zero degree of importance, hence its exclusion. With the exception of the variable 'motivation', other variables had two sub-variables (proxies). De Wet *et al* (1992), argue that these traits (theoretically) complement each other towards the success of a business.

Cluster analysis yielded six clusters and these clusters were rearranged to form four clusters. Clusters were classified according to their success potential and are the following:

6.6.1 High Success Potential Households (HSPH)

This cluster consists of 38 households. The main distinguishing feature of this cluster is that it possesses the highest level of entrepreneurial skill as depicted by the variables used to generate clusters. This cluster has the lowest mean age of respondents (48) compared to the other clusters as shown in Table 6.1. Despite having the lowest mean gross income, this group has a comparable higher commercialisation index of 0.92. There are also more risk takers among them. A striking observation is that this cluster has the highest percentage of respondents who do not think that keeping production costs low is important for a long-term success of the business. These are likely to be Moutse farmers who do planting mechanically despite extension officers' advice to using manual planting which is relatively cheap. It is also worth noting that this cluster regards having sole land rights and financial training before farming as a very important factor for success as revealed by a significant number of respondents (84%).

6.6.2 Moderate Success Potential Households (MSPH)

The entrepreneurial skills level of this group is almost similar to the high success potential households (HSPH) group. It is by far the largest group with 87 respondents. The majority of these respondents (60%) are in Nkomazi. It is therefore not surprising to find that 92% of the respondents in this cluster regard farming as their principal

occupation. It is likely that agriculture is a main source of farmers' livelihood. A considerable number of respondents (86%) in this group regard financial management training before farming as a very important factor for the long-term success of the farm. This group is second highest with regard to respondents regarded as risk takers, but a significant number of them are risk neutral. Like the first group, it has a mean land size of 7 hectares.

Table 6.1 Households Characteristics by Cluster Groups

	HSPH	MSPH	LSPH	VLSPH
Household characteristics/assets				
Number of households	38	87	34	18
Mean Age	48	54	61	53
Mean land size (ha)	7	7	9	5
Mean farming experience (in years)	7	8	7	8
Financial				
Mean Gross Income (R)	13558	26998	20604	28014
HCI	0.92	0.96	0.95	0.89
Gender (%)				
Male	50	56	79	67
Female	50	44	21	33
Educational status (%)				
No Schooling	21	44	44	55
Primary education	42	25	28	28
Secondary education	34	23	28	11
Tertiary education	3	8	-	6
Farming motive (%)				
Commercial motive (yes)	76	45	77	89
Farming as a principal occupation (yes)	87	92	79	89
Risk (%)				
Risk taker	13	7	3	-
Risk neutral	55	84	47	56
Risk averse	32	9	50	44
Credit (%)				
Access to credit (yes)	63	88	53	72
Management (%)				
Farmers keep records (yes)	66	92	77	94
Keep production costs low				
Not important	32	9	9	6
Important	24	8	12	22
Very important	44	83	79	72
To have sole land rights				
Not important	-	-	8	-
Important	16	10	55	50
Very important	84	90	37	50
Financial management training important before farming				
Not important	-	5	27	11
Important	16	9	41	44
Very important	84	86	32	44
Social capital (%)				
Co-operation with white commercial farmers (yes)	16	10	18	22
Farmers' organisation member (yes)	74	76	82	61
Region (%)				
Nkomazi	29	60	3	8
Moutse	23	23	40	14

6.6.3 Low Success Potential Households (LSPH)

This group is the second smallest and consists of 34 households. By far the majority of respondents (40%) in this group are located in Moutse. In addition, males dominate this group by far (79%). Despite having the largest mean land size, it has the second highest commercialisation index of 0.95. The mean age of respondents (61) is highest of all groups and as such a higher percentage of them (50%) are risk averse than any other group. Unlike other groups, having sole land rights is not regarded by this groups' majority as very important for the long term success of the farm enterprise; 8% of the respondents in the group regard it as not important – the only ones in the whole sample . In addition, it is the only group without respondents with a post-matric formal education qualification.

6.6.4 Very Low Success Potential Households (VLSPH)

With the smallest number of households (18), cluster analysis reveals this group as a group that stands out with a very low level of entrepreneurial skills. It has the smallest number of hectares (5 on average) and the lowest commercialisation index of 0.89. It is consists of a relatively young group of farmers as shown by a mean age of 53 years. None of respondents in this cluster prefer taking risk. An equal number of respondents (89%) in this group engage in farming for commercial purposes and regard farming as a principal occupation. Encouraging to note in this group is that it is the group with the highest number of respondents with a co-operation agreement or relationship with their white commercial farmers counterpart.

6.7 Discussion of Results and Implications

Cluster analysis provided a way of classifying households into four groups. It also provided insights into the characteristics of each group. As previously indicated, cluster analysis does not yield clearly identifiable groups that are entirely heterogeneous from each other. The four groups generated do share some similar characteristics and attributes. However, from the preceding analysis of various clusters one could argue that the first two groups (HSPH and MSPH) could be

referred to as very successful (VS) and these are potentially successful farmers, while the latter two (LSPH and VLSPH) could be referred to as less successful (LS).

A general and an apparent observation is that the VS group seem to be dominated by sample farmers in the Nkomazi region while Moutse sample farmers dominate the latter two groups. Furthermore, a noticeable observation is that the LS group has a relatively low percentage of risk takers. The VS group is dominated by a relatively young group of farmers and this is possibly another factor influencing farmers' attitude to risk.

These results have an important implication for the implementation of the South African cotton sector strategic plan. One of the challenges facing the South African cotton industry is the revitalisation of the existing cotton irrigation schemes as well as the acquisition of additional land and identification of a group of potential new commercial farmers to be settled thereon. R51 million has been earmarked to kick start this project in Mpumalanga. With a limited budget to be spent in the province, the results of the study at least gives an indication of the attributes associated with potential successful farmers and the region where the majority are likely to be found. While this study might be path breaking, there are various conditions that have to be fulfilled to successfully settle new farmers - each condition being necessary, but none being sufficient on its own in the absence of the others: sufficient land of adequate quality, necessary infrastructure and agri-milieu (Nel *et al*, 1998).

Typology analysis allows the definition of recommendation domains for technical advice, training and technology transfer purposes. The analysis shows that small-scale farmers are not a homogenous group. Thus the realistic description of the various socio-economic grouping can facilitate the design of the support system based on the needs and aspiration of such groups. For instance, extension officers can identify various modes of delivery in order to suit each group. With these groupings, therefore, extension officers are in an opportune position to lend valuable guidance and education to farmers, planners etc so that they make the best decision.

6.8 Concluding Remarks

The purpose of this chapter was to classify and describe sample farmers in terms of their farming potential. The theoretical background provided in this chapter provided a framework in which this objective could be achieved. The enormous variability that exists amongst small-scale farming communities demonstrates the difficulties of trying to classify rural farming households. The results of the cluster analysis technique yielded six clusters which were then rearranged to form 4 clusters, namely HSPH, MSPH, LSPH and VLSPH. These clusters could be grouped further into two main clusters known as VS and LS.

A conclusion that could be drawn especially from the VS group is that there are a group of relatively small-scale, commercially oriented farmers who have the necessary entrepreneurial attributes 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. However, it needs to be acknowledged that the results of this study do not represent the story of the vast number of small-scale agriculture in South Africa. This may then be another rich area for further research. It appears that agrarian reforms, including the development of small-scale agriculture, will continue to be a major focus for many years to come. Therefore, research emphasis need to focus, *inter alia*, on beneficiaries' selection criteria.

CHAPTER SEVEN

FACTORS ENHANCING MARKET PARTICIPATION

7.1 Introduction

The South African agricultural sector strategy, *inter alia*, aims to integrate the majority of subsistence farmers into the commercial agricultural economy. Identifying ways to increase market participation by smallholder producers requires identification of variables that influence market access. This chapter is largely conducted within the transaction costs economics framework while also considering other non-transaction costs variables. The presence of transaction costs is widely used to explain observed market failures and self-sufficiency in agriculture in developing countries.

One of the important questions in the research agenda and implicitly raised in the agricultural sector strategy is the identification of actions that could enhance commercialisation. Addressing the determinants of commercial orientation of the individual farmers could shed some light on further steps to be taken by various commodity organisations, the government *etc* in order to promote the rural market economy (Balint, 2003). Some of these determinants are common knowledge. They incorporate factors such as political and macroeconomic stability, enforcement of property rights, and fund allocation for agricultural research and extension. The purpose of this section is to identify farm level factors influencing or enhancing market participation in order to offer information for policy alternatives that could promote and enhance better commercial orientation, and thus lead to an improvement in rural household incomes. Policy options for commercial orientation can be integrated in the broader framework of integrated sustainable agricultural and rural development strategy.

A logistic regression model is used in order to achieve the objective of this chapter. This model has the ability to determine the effect of variables on the probability of

commercialisation, plus the effect of individual variables. It yields the highest predictive accuracy possible. The model is first specified and this is followed by a discussion of the main determinants of market participation. Main determinants to market participation include both transaction and transaction related variables. Section 4 provides empirical results of the logistic regression model, and this is followed by a conclusion.

7.2 Specification of the Model

The model developed explains the relationship between household commercialisation and transaction costs, household characteristics, assets and family endowment. The analysis will be conducted within the logistic regression framework. This model is preferred, firstly, because of its ability to determine the effect of variables on the probability of commercialisation. Secondly, it yields the highest predictive accuracy possible with a given set of predictors (Aldrich and Nelson, 1984). The logistic regression model can be expressed as:

$$\text{Log} \left(\frac{P_{(y=1)}}{1 - P_{(y=1)}} \right) = \beta_0 + \sum_{i=1}^n \beta_i \chi_i \quad \text{or as} \quad \left(\frac{P_{(y=1)}}{1 - P_{(y=1)}} \right) = e^{(\beta_0 + \sum_{i=1}^n \beta_i \chi_i)} \quad (1)$$

Where P is the probability that $y=1$ and χ_i are the set of explanatory variables. In this analysis χ will contain both dichotomous and continuous variables. In the second expression in equation (1), the left-hand side is an odds ratio and the right hand side gives the marginal effects of χ_i on the odds indicated by the exponential of β_i ($\exp(\beta_i)$).

χ_i is a set of independent variables (variables such as demographics characteristics, resources (e.g. land size) and transaction costs variables e.g. information and transport costs). The dependent variable is the household commercialization index (HCI) which is defined as gross value of all crop sales_{hh1,year}/gross value of all crop production_{hh1,year}. HCI can take any value from zero to one and it can also be expressed in percentage terms.

Matungul *et al* (2001) used marketing methods index as a dependent variable reflecting the level of commercialisation. Their model was specified as follows:

Marketing methods index = f(transaction cost, region, farmer and household characteristics)

Marketing methods index is an index showing depth in marketing methods used by the households. The index was, *inter alia*, calculated taking into account various marketing channels used by the sampled farmers as well as different techniques to inform potential customers about their products. However, in contrast with that research, cotton producers sell their cotton to a single buyer (ginners) and rarely produce other marketable products.

Makhura, Coetzee and Goode (1996) applied a method of qualitative choice to determine primarily the relationship mainly between socio-economic characteristics of farmers and their commercialisation. This was done by estimating logit models to identify characteristics that differentiated one commercialisation class from another namely, high agricultural commercial households, moderately commercial households and very low commercial households. In addition, Makhura *et al* (1996) operationalised commercialisation by developing sources of earnings from sales of agricultural products while others operationalise it by employing surplus production. The latter is flawed because marketing behaviour is a two-step decision process: firstly, the household decides whether or not to participate in the market, and secondly, establishes how much to sell. However, marketing behaviour is somewhat more complicated especially for high commercial farmers. To these farmers, the two steps usually follow only at harvesting time. More importantly, the choice of method is primarily dictated by the problem under evaluation and to a certain extent by the nature of data.

7.3 Determinants to Market Participation - Theoretical Underpinnings

Transaction costs are the embodiment of access barriers to market participation by resource poor smallholders. Transaction costs are normally defined as all costs of entering into contracts, exchange or agreement: searching for trading partners, screening potential candidates, obtaining and verifying information, bargaining,

transferring the product, and monitoring, controlling and enforcing the transaction. At best, these costs are partly observable. Several independent variables were selected to estimate the predicted values of the dependent variables. The choice of the variables used is largely based on Govereh and Jayne, 1999; Strassberg, Jayne, Yamano, Nyoro, Karanja and Strauss, 1999; Heltberg and Tarp, 2001; Lapar, Holloway and Ehui, 2003 who extensively reviewed factors influencing farmers to market participation. The explanatory variable and their expected signs are shown in Table 7.1. The set of independent variables that are potentially expected to influence market participation are grouped into the following classes: household characteristics, physical assets, social capital, transaction costs, livelihood development services and regional variables.

Table 7.1 Definition of Variables Influencing Increased Market Participation

Variables	Variable description	Anticipated sign
Household Background characteristics		
Age of the head (in years)	Continuous	-
Dependency ratio	Continuous	-
Education of the head	Continuous	+
Ability to understand/speak English	Able to speak/understand English = 1, 0 otherwise	+
Gender	1=male, 0 otherwise	+
Household physical assets		
Livestock ownership	Own livestock = 1, 0 otherwise	+
Ownership of cultivation equipment	Own cultivation equipment = 1, 0 otherwise	+
Own Transport	Own transport = 1, 0 otherwise	+
Land size (ha)	continuous	+
Access to non-farm income	Access to non farm income = 1, 0 otherwise	+
Social capital		
Member of farmers' organisation	Belong to farmers' organisation = 1, 0 otherwise	+
Co-operation with white commercial farmers	Cooperation with white farmers =1 and 0 otherwise	+
Born in the community	Born in the community =1, 0 otherwise (migrant)	+
Transaction costs		
Distance to market (Km)	Continuous	-
Access to market information	Have access to market information =1, 0 otherwise	+
General state of the road	Very poor = 0; Poor=1; Fair=2; Good = 3 and Very Good =4	+
Access to guaranteed market	Have contract =1, 0 otherwise	+
Proximity to towns	Closer to town =1, 0 otherwise	+
Livelihood development services		
Access to finance	Have access to finance = 1, 0 otherwise	+
Regional variables	Nkomazi=1 Moutse = 0	+/(indeterminate)

Household background characteristics are captured by age, education, ability to speak English and household size (dependency ratio). As far as age is concerned the relationship is expected to be negative depending on the stages of development. Younger farmers are progressive and are likely to be receptive to new ideas and probably understand the benefits of agricultural commercialisation. In addition, usually relatively young farmers have higher socio-economic status that, *inter alia*, enables them face low transaction costs. Younger farmers also have higher levels of education and contact with the outside world. In most cases, older farmers view farming as a way of life rather than a business and has a strong emotional or almost biological connection with farming and land. This variable was measured in number of years.

The size of the household represents the productive and consumption unit of the household (Makhura, 2001). Traditional agrarian studies show that household members represent labour resources and are hence posited to be directly related to engagement in agricultural activities. It is therefore sensible to expect that a household with large household members can produce more marketable output or store it for household consumption. In addition, Lapar *et al* (2003) hypothesised that the propensity to participate into the market economy declines with numbers of household members. To determine the direction of the relationship between the household size and the dependent variable, this study adopted the use of the dependency ratio as a proxy for the household size and it is hypothesised that households with more dependants are likely to have a lower level of commercialisation.

Education is an important tool to escape poverty, but only if the education system reaches the right people with the right content (Heierli and Gass, 2001). Intellectual capital as captured by education is hypothesised to play a positive role in influencing market participation. Level of education gives an indication of the household ability to process information and causes some farmers to have better access to understanding and interpretation of information than others. High education level is important, as it is likely to lead to the reduction of search, screening and information costs. However, the expectation may be reversed when there are competing and more remunerative employment opportunities available in

the area that require skills that are enhanced by more education (Lapar *et al*, 2003). Closely related to the preceding variable is the respondents' ability to speak/understand English. Inability to speak/understand English prevents a resource-poor farmer from successfully engaging in trade, especially outside his settlement. It is likely that such farmers would face high transaction costs in both factor and product markets outside their own area (Matungul *et al*, 2001).

One of the biggest challenges to the stakeholders involved in the process of agricultural transformation in sub-Saharan Africa is the high percentage (70-80%) of women responsible for household food production. Until recently, women were usually excluded from a variety of services such as access to inputs (e.g. credit) and they were neglected by agricultural extension services (Farinde and Taiwo, 2003). In addition, some institutional arrangements such as market contractual agreements were exclusively for male-headed households. It is therefore, expected that female-headed households have a lower commercialisation index relative to their male counterparts.

The other construct of transaction costs is access to assets. Heierli and Gass (2001) argue that assets empower the rural poor by increasing their incomes, reserves against shock and choices to escape from harsh and exploitative conditions. The crux of the matter here is that ownership of productive assets in particular makes a household less vulnerable to shocks and the extent of vulnerability determines household market participation. Thus, highly vulnerable households are expected to have a lower commercialisation index. In essence, it is primarily those who are relatively well endowed with agricultural capital who commercialise.

Ownership of assets has been measured in terms of ownership of livestock, cultivation equipment, transport, arable land and access to non-farm income. All these are likely to increase the farmers' access to loans. Ownership of livestock is expected to exert a positive impact on both the likelihood that participation will occur and the amount of selling that will be undertaken once the decision to participate has been made. This hypothesis is supported by Heierli and Gass (2001) who argue that acquisition and ownership of productive assets (e.g. cattle)

can pave the way for a family to participate in economic activities. Ownership of cultivation equipment is associated with timely planting that can lead to higher production. Households with relatively higher production levels have a higher probability of market participation. Again, households with own transport are likely to transport their agricultural product on time to the market before losing value. It is therefore hypothesised that such households will have higher levels of commercialisation.

Access to arable land is a necessary condition for market participation. This variable is measured by the size of the arable land the household operates. The larger the size of arable land a household uses, the higher the production levels are likely to be, and the higher the probability of market participation. Non-farm activities mostly consist of non-farm employment (professional/or non-professional usually available in nearby towns). Access to non-farm income may lead to risk reduction in household decision making and, with it, increased propensity to undertake higher risk activities, notably selling crops or producing for the market (e.g some non-edible crops such a cotton).

Social capital is another construct of transaction cost applied in the study. There is a growing body of social science research associated with the concept of social capital. The central thesis of the social capital literature is that features of social organisation, such as networks of interaction have resource potential to individuals and groups. Social capital has been linked to a variety of outcomes, such as success in job seeking behaviour, entrepreneurship and successful community action or development. It is through networks that information and other resources can be transmitted, and the existence of trust facilitates co-operative behaviour based around these networks (Sharp and Smith, 2003).

Another explanatory variable used was “born in the community”. This variable was used as a proxy for trust. In most rural areas people born in the same community are more trusted than people who migrated into that community. Trust is hypothesised to lower transaction costs and lead to superior information sharing which improves coordination and joint efforts to minimise inefficiencies. Some scholars even claim that national economic efficiencies are highly correlated with

high trust institutional environments (North, 1990; Dyer and Chu, 2000). In addition, economic success of a nation as well as its ability to compete is conditioned by the level of trust inherent in the society.

Collective action as measured by belonging to farmers' organisations strengthen farmers bargaining and lobbying power and facilitate obtaining institutional solutions to some problems and coordination (Jones, 1996, cited by Matungul *et al*, 2001). In addition, collective action has an additional advantage of spreading fixed transaction costs. This variable is expected to impact positively to market participation. Cooperation with white commercial farmers lowers transaction costs as it enhances opportunities for information sharing. White commercial farmers have access to services and profitable markets; this is a valuable resource that can promote market participation.

Transaction costs are hypothesised to impede market participation because they impose added cost burdens to the efficient conduct of market entry activities. The following factors were used to capture the transaction costs variable namely, distance to the market, access to market information, general state of the road, access to guaranteed market and proximity to towns. Distance to market is considered as a proxy for transaction costs and is hypothesised to negatively affect market participation; that is, the farther away a household is from the market, the more difficult and costly it would be to get involved. Thus, greater distance to the market increases transaction costs.

Infrastructural obstacles such as state of the road as well as inadequate road networks obviously hinder marketing efficiency. Remote locations of farms coupled with poor road infrastructure results in high transport costs and in cases where buyers provide their own transport, this further reduces the price that buyers are prepared to pay farmers. Low prices are a disincentive to market participation. Inadequate transportation infrastructure raises search and monitoring costs. In addition, inadequate and dilapidated state of the rural road network impedes the physical movements of goods and thereby the integration of rural markets. Many rural roads are impassible, except perhaps, by tractors, during the rainy season.

A guaranteed market or contract farming is one of the institutional arrangements that can promote market access to the emerging farmers. Existence of the guaranteed market is hypothesised to impact positively on the dependant variable. The expected positive relationship is based on an *a priori* expectation that there is a marginal cost associated with searching for the potential buyer. Respondents were asked whether they have any contractual agreement or guaranteed market agreement with any agribusiness companies.

All sampled farmers have access to information. In view of this, farmers were asked to indicate the type of information that they get from each source. The intention was to capture market information as a closely relevant factor that can be used to predict market participation. Marketing efficiency is hindered not only by infrastructural factors but also informational bottlenecks which increase transaction costs by raising search, screening and bargaining costs. Small-scale farmers are often not aware of prices and market opportunities for their product and find it difficult to participate in alternative markets.

Another variable used as a proxy for access to information and market is proximity to towns/cities. Markets outside major cities/towns are not well integrated and competition in these markets is often highly imperfect. Finding a buyer in these markets is often a problem. In addition, Makhura (2001) argues that proximity to towns reflect how far farmers have to travel to reach sources of information. Such information sources are located in nearest towns where there are offices and markets. Thus, the farther a household is away from the town, the higher the transaction costs of obtaining information and market outlet.

Unavailability of credit inflates transaction costs in both input and output markets. The amount of agricultural product sold should be understood in terms of the linkages that exist between input and output market. It is hypothesized that unavailability of credit impacts negatively on farmers' ability to participate in markets. The final construct of transaction costs applied in the study is the regional variable. Geographical factors help to capture variation in the two regions particularly in terms of risk *etc.*

7.4 Results and Discussion

7.4.1 Descriptive Results

This section reports the descriptive results of the relationship between household commercialisation and determinants of commercialisation. Cotton experts reckon that a commercialisation index of at least 0.8 would be an acceptable level of commercialisation within the cotton industry. This index was adopted as a cut-off point for the transformation of the observed HCI in the surveyed regions. HCI was then transformed into binary responses. Thus, households with a commercialisation index of less than 0.8 were assigned a dummy variable 0 and 1 otherwise. Sample farmers with an HCI of less than 0.8 are referred to as aspirant commercial farmers (low commercialisation) and those with a higher HCI as commercial farmers (high commercialisation). Out of the 177 observed households, 32% and 68% are regarded as aspirant commercial (low commercialisation) and commercial farmers (high commercialisation) respectively. Table 7.2 highlights descriptive statistics of only the significant variables.

Table 7.2 Household Commercialisation Rates for Significant Variables

Variables	Low commercialisation	High commercialisation
Mean dependency ratio	4	3
Mean age	51	54
Born in the community (%)	89	78
Mean land size (ha)	7	7
Access to loan (%)	60	82
Farmers with own transport (%)	22	29
Mean distance to market (Km)	22	27
Ownership of livestock (%)	36	18
Ability to speak/understand English (%)	49	50
Access to market information (%)	51	55
Moutse (%)	51	39
Nkomazi (%)	49	61

According to Table 7.2, mean dependency ratio, access to loan, ownership of transport, ability to speak/understand English and access to market information are consistent with *a priori* expectations in as far as the level of commercialisation is concerned. On the other hand, other variables in the table are contrary to a *priori* expectation and will be dealt with in detail in the subsequent section.

7.4.2 Empirical Results

As explained when the model was specified, the dependent variable used in this study is HCI. Logistic regression is designed to use a mix of continuous and categorical predictor variables to predict a categorical outcome or dependent variable. This section discusses results of the significant factors determining level of market participation³. All variables mentioned in Table 7.1 were considered for the model. Then a step by step process of deletion of insignificant variables reduced the number of significant variables to eleven as shown in Table 7.3.

The Pesaran-Timmermann test statistic shown in Table 7.3 was used to test for predictive efficiency of the model. According to this test, a significant association exists between the observed and the model's prediction of a household's commercialisation status. With regard, to the predictive efficacy of the model, Table 7.3 shows that, of the 177 sample households included in the model, 79% (139) are correctly predicted. The log likelihood value of 63, with $P < 0.001$, indicates that at least one of the parameters of the determinants of household commercialisation shown in the equation 1 is significant.

³ Before a logit model was fitted, a correlation matrix was computed for all explanatory variables. No severe multicollinearity problem was detected

Table 7.3 Logistic Regression of Factors Influencing Household Commercialisation

Variables	Coefficient	Std. error	z-statistic	Probabilities
Constant	-3.3214	1.5480	-2.1456	0.033
Household Characteristics				
Age (AGE)	0.0409	0.0189	2.1670	0.032
Dependency ratio (DEPRATIO)	-0.2499	0.1036	-2.4130	0.017
Ability to speak/understand English (ENGLISH)	0.6584	0.4447	1.4806	0.141
Regional Variable				
Region (REGION)	3.5385	1.0653	3.3218	0.001
Social Capital				
Born in the community (TRUST)	-1.3074	0.6672	-1.9596	0.052
Livelihood Development Services				
Access to loan (ACCLOAN)	0.9058	0.6302	1.4374	0.153
Household Physical assets				
Land size (LSIZE)	-0.0856	0.0438	-1.9519	0.053
Ownership of livestock (LIVEOWN)	-1.0813	0.4921	-2.1975	0.029
Ownership of transport (OWNTRANS)	0.4807	0.2630	1.8280	0.069
Transaction Costs				
Access to Market Information (MKTINFO)	1.5896	0.5982	2.6573	0.009
Distance to market (DISTANCE)	0.0334	0.0181	1.8436	0.067
Percentage of correct prediction	0.785			
The Pesaran-Timmermann test statistic	6.5070			<0.001
Log likelihood value	63			<0.001

Some of the transaction costs proxies influence the level of market participation significantly, and the signs of the estimated coefficients are consistent with *priori* expectations. This is particularly true of the dependency ratio, ability to speak/understand English, access to loan, ownership of transport and access to market information. A negative relationship exists between the level of commercialization and the dependency ratio. This relationship implies that household members tend to consume more than they contribute to the sales of the crop. A positive and significant relationship was found between household commercialization and age of the respondents. This relationship is contrary to the

a priori expectation. A possible explanation that can be advanced for this is that older and more experienced household heads tend to have more personal contacts, allowing discovery of trading opportunities at low cost (Matungul *et al*, 2001). Moreover, Makhura (2001) argues that being older also assists farmers to overcome fixed transaction costs since some experiences about the market have been accumulated overtime. Ability to speak or understand English was found to have a positive effect on the level of commercialization. This means that the likelihood of commercialization increases with farmers' ability to speak/understand English.

The regional variable of Nkomazi region shows a positive coefficient and was significant ($P=0.001$). These results imply that farmers in Nkomazi region are more likely to produce a greater percentage of their produce for the market. In addition, the results probably confirm that Nkomazi is not a risky region particularly for cotton production and therefore has a relatively higher potential due to suitable climate and soil type. Living in a risky area is clearly associated with low commercialisation. The high level of commercialisation in the region may also be ascribed to the level of support they receive relative to that in Moutse. For instance, loan applications in Nkomazi are made by ginners on behalf of the farmers unlike in Moutse where they are made on individual basis by small-scale farmers themselves.

The variable born in the community was significant ($P=0.052$) and has an unexpected negative sign. This implies that farmers born in the same community and expected to trust one another, because they have known each other since childhood, are likely to have a low level of commercialisation relative to migrant residents. This finding is puzzling and needs further investigation as trustworthiness, in particular, is capable of reducing the transaction costs, both in the inputs and output markets. It is also possible that probably due to little social support and networks that migrant residents may receive or have in the community, makes them work hard to enhance their livelihood through increased market participation.

Access to loans was found to have a positive relationship on the level of market participation. A number of theoretical studies suggest that credit indeed has a positive impact on small farm production (Spio, 2002). Furthermore, credit is also one major constraint limiting market access, participation and the competitiveness of the industry.

The size of the land is important because transaction costs are largely fixed costs that can be spread across more output on large farms. Results in Table 7.3 reveal the existence of an unexpected negative relationship between land size and level of market participation. This inverse relationship implies that farmers with relatively large land size are likely to have low levels of commercialisation. This is probably an indication that increased market participation is also a function of land productivity. Access to assets such as ownership of livestock provides households with leverage to invest in market participation. However, logistic results indicate that ownership of livestock has a negative relationship on the level of market participation. Although not expected, this finding probably supports the generally accepted livestock complex myth. According to this myth, peasant farmers would keep livestock merely for prestige and wealth. In this regard, wealth is defined by Doran, Low and Kemp (1979: 42) as the accumulation of assets which confer among other things prestige, emotional satisfaction and status. Ownership of transport was found to be significant and has a positive influence on the level of market participation. This implies that households that own transport are more likely to be commercial farmers than those without.

Access to market information has the expected sign and it is significant ($P=0.009$). Thus, the more information the household has on marketing, the less will transaction costs be – thus increasing market participation. The other construct of transaction cost is distance to the market. The sign of the coefficient for distance to the market is positive and it is contrary to the *a priori* expectation. This implies that farmers facing relatively longer distance are more likely to be commercial farmers. A possible explanation that can be advanced is that agricultural output, particularly cotton bales, is not charged per distance travelled, but by the number

of bales transported. In addition, cotton bales sometimes depend upon the services of the ginners which are provided at highly subsidised rates.

7.4.3 Determination of the Partial Effects and Changes in Probabilities for the Significant Variables

The marginal effects of a unit change in the continuous variables, computed at sample means, on the probability of commercialisation were estimated. Table 7.4 and 7.5 give results on the partial effects of continuous and discrete variables respectively. The partial effects of the discrete variables are calculated taking the difference of the probabilities estimated when the value of the variable is set to 1 and 0 ($X_1 = 0$, $X_1 = 1$) respectively. According to Table 7.4, the marginal effect of a unit change in land size, computed at sample means of holding size, on the probability of household commercialisation is -0.017. This means that the probability of commercialisation decreases by 0.017 (about 2%) for a one hectare increase in farm size. Each additional dependant in the household furthermore decreases the probability of increased market participation by 5%. A unit change in age, computed at sample means, increases the probability of increased market participation by 1% and this magnitude of change and the direction of impact is the same as a unit change of a distance travelled to the market.

Table 7.4: Partial Effects for Continuous Determinants

Determinants	Partial Effects
Land size	-0.017
Age	0.007
Distance	0.007
Dependency ratio	-0.05

Table 7.5 shows discrete variables found to have a significant impact on household commercialisation. For instance, a positive and significant relationship was found between access to loan and the probability of household being a commercial farmer. This means that the likelihood of commercialisation increases with farmer access to loan. According to Table 7.5, a shift from having no access

to loan ($X_i=0$) to access to loan ($X_i=1$) increases the probability of commercial farming from 0.552 to 0.711 i.e by 16%. Owning livestock and being born in that community decrease the probability of being a commercial farmer by 19% and 25% respectively. Similarly, the probability that those who do not own livestock and the migrants become commercial farmers is higher by 19% and 25% respectively.

Table 7.5 Change in Probabilities between $X_i=0$ & $X_i=1$ for the Significant Discrete Determinants

Determinants	Probabilities	Change in probabilities
Access to loan		
No access	0.552	0.159
Access	0.711	
Born in the community		
Migrant	0.890	-0.254
Born	0.636	
Ability to speak/understand English		
Inability	0.619	0.104
Ability	0.722	
Ownership of livestock		
No livestock	0.716	-0.191
Own livestock	0.524	
Ownership of transport		
No transport	0.627	0.080
Own transport	0.707	
Access to market information		
No access	0.440	0.281
Access	0.720	
Region		
Moutse	0.327	0.500
Nkomazi	0.826	

Finally, the probability of commercial farming is also observed to increase with having access to market information (28%), ability to speak/understand English

(10%), ownership of transport (8%) and farming in Nkomazi instead of in Moutse (50%).

7.4.4 Impact on Commercialisation of Major Determinants of Market Participation

This section reports simulation results for the levels of change in the conditional probability of being high commercial following improvement in any of the significant factors. Simulations were conducted with reference to a base group of households representing aspirant commercial farmers. The base group represents aspirant commercial farmers (low commercialisation) with mean values for continuous variables as those mentioned in Table 7.2. In addition, the dummy variables for other discrete variables were set to zero.

Table 7.6 Simulated Impacts of Determinants on the Probability of Increased Market Participation.

Variables	Predicted probabilities
Base	0.109
If the household own transport (vehicle)	0.060
If number of dependants is reduced by one	0.136
If household understanding/ability to speak English improves	0.191
Move to farm in Nkomazi instead of in Moutse	0.808
Instead of being a migrant resident to being born in that community	0.032
If household access to loan status improves	0.233
Land size increased by 23 hectares	0.017
If household owns livestock	0.040
If access to market information improves	0.375
If distance to market increases by 5 km	0.126

According to Table 7.6, the conditional probability of increased market participation for the base group of households is 0.109. This means that, of 100 households, 11 are commercial farmers. If a group of households with characteristics similar to that of the base group of farmers own transport, the number of commercial farmers will increase by 6%. A unit decrease in the number of dependants (from 4

to 3) will lead to an increase in the probability of commercial farming from 11% to 14%. An interesting point to note is that ownership of livestock by sample households' result in a decrease in the probability of being a commercial farmer from 11% to 4%. This probably applies in cases where resources used for livestock maintenance (e.g acaricides) get redeployed and are utilised in other productive activities that influence household agricultural production. Other decreases in the probability of being commercial farmers are observed with regard to an increase in land size and born in that community as shown in Table 7.6.

It is also shown in Table 7.6 that a move from farming in Moutse to Nkomazi increases considerably the probability of commercial farming from 11% to 81%. This analysis probably confirms the general knowledge within the cotton industry that Moutse is a marginal cotton producing area.

7.6 Discussion and Conclusion

This chapter provides empirical evidence of the statistically significant factors influencing commercialisation. The hypothesis that transaction costs and other closely related factors influence commercialisation was tested using the logistic regression model. It should be acknowledged that transaction costs are not easy to measure. Empirical analysis supports the hypothesis that transaction cost is one of the main determinants of commercialisation. The statistically most significant factors are age, ability to speak/understand English, region, ownership of transport, access to market information, distance to market, dependency ratio, trust, land size and livestock ownership. The last four variables influence commercialisation negatively. These findings suggest, *inter alia*, that pro-active marketing support services in the form of information, accessible markets and transport means can help farmers to perform much better in household commercialisation.

Logistic results confirmed the existence of a negative relationship between household size (as represented by the dependency ratio) and household commercialisation. This finding brings to the fore the importance of a demographic

policy which takes into account the composition of the households. For a commercialisation process to be successful it is pertinent to determine the role of different household members in household market participation. For example, consideration should be given on how to make youth contribute to market participation process, in contrast to being dependent (Makhura, 2001). This therefore calls for the consolidation of government efforts (including Umsobomvu) to promote the development of young farmers.

However, a finding worth noting is the effect of land size towards household commercialisation. The direction of the impact of land size is probably an indication that increased market participation is also a function of land productivity. If this holds true, it therefore implies that any initiative in the cotton industry to increase land size must be preceded with efforts to increase the productivity of the land currently under cultivation. Partial effects, computed at sample means, indicate that the probability of commercialisation decreases by 2% for a one hectare increase in farm size. In addition, simulation results show a decrease in the probability of commercialisation if land size increases. Evidence from other countries (e.g Zimbabwe) as presented by Govereh and Jayne (1999) indicated that in these studies household commercialisation was indeed positively related to land holding size. The extent to which these results can be generalised do not yet seem to be clear.

Moreover, the direction of the impact of land size on household commercialisation has certain implications for the South African land reform programme. As Cotton South Africa and other commodity organisations aim to revive their respective industries, study findings seem to suggest that various tenure reform arrangements need to be explored. A notable one is the introduction of a land rental market (including hire purchase with an option to buy). 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. That is, 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

These research results shed light on the main determinants to increased market participation which can enable cotton stakeholders configure their operation in the post-market liberalisation environment to promote smallholder agricultural commercialisation. It is however, important to note that the study uses cross sectional data that do not capture changes over time. A longitudinal study is needed to capture changes over time with regard to small-scale commercialisation.

SUMMARY, CONCLUSION AND POLICY PROPOSAL

8.1 Introduction

This chapter provides the summary of the study and conclusions on future actions imperative for the successful integration of small-scale farmers into the commercial agricultural economy. The study used small-scale cotton producers located in Mpumalanga as an example.

8.2 Summary

The broad objective of the study was to generate information that will facilitate the integration of small-scale emerging agriculture into the mainstream economy. To achieve this objective, surveys were conducted in two cotton growing regions of the Mpumalanga Province, namely Moutse and Nkomazi. The total number of farmers actually interviewed in both regions is 177.

The study provided an extensive theoretical overview of the issues relating to the commercialisation of small-scale agriculture. The basis for analysing and understanding of the major factors behind the success or failure of small-scale farmers commercialisation in developing countries lies within the NIE school of thought. Summarily, NIE postulates transaction cost to be the key to economic performance. Contract farming (CF), farmer co-operatives and joint ventures are some of the commercialisation models used to reduce transaction costs. Commercialisation of small-scale agriculture as demonstrated by the literature has its own advantages and disadvantages that may prevail under different circumstances. The rationale for commercialisation lies heavily on its positive effect on the following:

- Employment effect
- Nutritional and health effect

- Income effect
- Food security effect

However, on the other hand, it is castigated on the following account;

- Causes food insecurity
- Asset specificity
- Negative effect both on women and children

Problems experienced through commercialisation serve to demonstrate the frequent need for intervention either by government or organisation by farmers. The positive effects of commercialisation by far seem to outweigh its negatives. Production of commercial crops (e.g. cotton) plays a critical role in the economies of many developing countries. Cotton, for example, is critical for improving rural household income and facilitating the emergence of a viable commercial smallholder agriculture.

The South African cotton industry has undergone a series of developmental changes. The most notable of these changes is the deregulation of the South African agriculture which was expedited by the introduction of the Marketing of Agricultural Product Act 47 of 1996. The emergent forces of trade liberalisation present new opportunities and challenges to the South African cotton industry. One major challenge facing cotton industries particularly of developing world are low international prices caused by cotton subsidies by developed countries such as the USA. Low prices affect all the stakeholders in the cotton pipeline, including ginners and spinners. Some challenges experienced particularly by producers are inherent in nature e.g agronomic constraints, lack of institutional support and declining of agricultural support services. To partially curb the aforementioned constraints South Africa adopted genetically modified cotton. This technological advancement offers many advantages such as increased yield, reduced insecticides use and lower production costs.

Survey results reveal that cotton production is one of the many livelihood sources for the majority of the surveyed farmers in the region. It is preferred by almost half of the respondents mainly because it is drought resistant. Sample farmers grow cotton as their main crops mainly for the following reasons:

- Existence of a ready market
- Avoidance of social risk
- A profitable crop
- Experience and knowledge in cotton production
- Family encouragement
- Easy crop to manage
- Experimentation

Cotton is grown under an institutional arrangement known as outgrower scheme (contract farming) spearheaded by the ginners. This type of arrangement offers mutual benefit both to the producers and the ginners. To the producers the main benefit is the guaranteed markets while ginners have guaranteed supply. Partially because of the guaranteed market, cotton has the highest commercialisation index (0.96) of crops grown by surveyed farmers. The main contractual attributes most preferred by the sample farmers are the following and are listed in order of importance;

- Non binding contract
- Offers credit
- Training and extension services
- Offers guaranteed market
- Incentive to work hard
- Transport to market

The main threat to the continuation of contract farming in the surveyed regions is the non-repayment of loans. The direct effect of this is the current decline of the level of support to the producers by the ginners. Currently, the main type of support that sample farmers commonly receive from the ginners is transport.

Profitability analysis measured within the gross margin (GM) framework shows a GM/ha of R1072 and R563 in Moutse and Nkomazi respectively. This analysis also revealed that Moutse is a high cost producing area. Moutse sample cotton growers obtained an average yield of 973kg/ha which is 44% higher than Nkomazi average yield. The production year upon which this data is based is regarded as

an abnormal year. Using production data from the normal years, sensitivity analysis showed a significant improvement in the profitability of cotton production in Nkomazi. GM analysis was supplemented by break-even analysis (BEA). BEA highlighted the number of cotton bales to be produced when price is set at various levels. For instance, when price is set at R3.65/kg the break-even quantity for Moutse and Nkomazi cotton growers is estimated to be 1073 and 917 kg/ha respectively. To break-even, therefore, higher quantities of seed cotton are required in Moutse compared to Nkomazi at various level of prices.

Cluster analysis technique was applied to generate various farmer categories according to farming potential. This typological analysis yielded four clusters, namely high success potential households (HSPH), moderate success potential households (MSPH), low success potential households (LSPH) and very low success potential households (VLSPH). The former two clusters could be regarded as VS group while the latter could be referred to as LS. The major distinguishing feature between the two groups is that the VS group possesses the necessary entrepreneurial attributes to make a success of possibly larger more viable farming enterprises. Findings from this typology analysis can facilitate the design of the support system based on the needs and aspiration of such groups.

Using small-scale cotton growers as an example, it is important to know the main determinants to increased market participation. Results of the logistic regression model revealed that transaction costs and other transaction related variables influence commercialisation. Statistically significant variables were age, ability to speak/understand English, region, ownership of transport, access to market information, distance to market, dependency ratio, trust, land size and ownership of livestock. The last four variables negatively influence commercialisation. With regard to land size in particular, results of the logistic regression indicate that level of commercialisation does not increase with land size. This probably indicates that increased market participation is also a function of input (land) productivity. Thus, increases in land size must be preceded with productive use of the land currently under cultivation. This is important for South Africa's agrarian reforms.

There seems to be a window of opportunity to improve the profitability of cotton production in the study areas. Certain policy options need to be considered to realise the full potential of small-scale cotton growers and such policy options are discussed below.

8.2 Policy Proposal and Recommendation

The empirical results obtained in the study raise several issues pertaining to small-scale farmers' integration to the commercial economy. Cotton is an important source of livelihood and household income. However, there are a number of challenges that threaten this livelihood source. On the basis of the synthesis presented in various sections of the study, this section suggests a series of options that the South African cotton industry must consider and grapple with as it attempts to resolve the pressing challenges it faces. This set of options is meant to be a starting point for a serious debate leading to effective solutions.

8.2.1 Financing Small-Scale Cotton Growers

The sustainability of outgrower arrangements depends on reliable loan recovery and a productivity enhancing mix of inputs and support services to farmers. Few small-scale farmers seem to repay their loan to ginners, while a substantial number seem not to. This is a significant threat to the industry overall and imposes costs to farmers who do repay their loan. It will be important to identify the key characteristics of defaulting small-scale farmers and evaluate the strategies that might overcome the problem. More importantly, the regional monopolies enjoyed by the ginners lend itself to contract farming as there is less chance of side selling.

In the current approach to financing, small-scale farmers are treated as being homogenous. There is a need to develop a typology of small-scale cotton producers. This typology, *inter alia*, need to operate different kinds of credit schemes based on farmers' level of production, yields and perceived risk (e.g master farmers, gold club members and diamond members *etc*). Farmers under each typology therefore need to be provided with inputs on credit at different stages of the cultivation season. In addition, credit provision for the following season can be provided based on the yield level for the previous year. The

database owned by Vunisa can thus be passed on to the Land Bank to serve this purpose.

8.2.2 Promotion of Outgrower Schemes/Contract Farming

CF seems to be the future of agricultural production and marketing particularly in this age of biotechnology. The South African agricultural policy seems to be silent on outgrower schemes. Government has to play an important role if CF is to be successful. There appears to be a need for a well developed and efficient legal system. A relevant legal system seems to be a necessary pre-condition for a successful operation of CF or alternatively proper implementation if it exists.

However, the legal system alone is not a panacea for CF to work successfully. It is important particularly for both producers and processors (ginners) to have a collaboration consciousness. It should be emphasized that both sides need each other in order to make a contractual relationship that operates for their mutual benefits. Otherwise, the cooperation brought by CF would always be a source of disputes and dissatisfaction. It is worth noting that contractual agreements are of different intensity and as such problems experienced vary from one contract to the other as well as by the nature of the crop grown.

8.2.3 Investment in Rural Infrastructure

The low profitability of small-scale cotton production is exacerbated greatly by low production volumes. Low production in the study regions is a result mainly of adverse climatic conditions prevalent under dryland conditions. Infrastructural investment plays an important role in inducing farmers to move towards the commercial agricultural system. Investments are required in both hard and soft infrastructure. Urgent attention for physical Infrastructural investment within the cotton industry should be in the provision of irrigation facilities and market infrastructure. The provision of irrigation will provide farmers with the flexibility to make crop choice decisions and to move freely between crops.

Soft infrastructural investment, especially education is also vital in increasing the productivity of farmers. The government must consider providing cotton specialists

to the cotton industry on secondment terms. These specialists can, *inter alia*, be used in facilitating loan applications with ginners or Land Bank as well as monitoring of such loans. Investment in infrastructure will help drive down the transaction costs associated with agricultural commercialisation.

8.3.4 Consolidation of Farmers Organisation

It is encouraging that some sample farmers do belong to farmers' organizations. It is very important for producers to consolidate and act in an organized manner. Strong farmers' groups could enforce their bargaining power in markets in order to ensure better prices and other services for their produce and inputs. Organized groups gain recognition and can achieve results far superior to those achieved by unorganized farm producers. If successfully developed and effective in their operations, companies/banks could substantially reduce their loan monitoring costs by working with effective farmers' organizations. It is therefore important for farmers' organizations to develop a sense of honesty and fair dealing in this regard. Banks/ginners should, *inter alia*, consider group lending through working with effective farmers organizations. In this regard farmers' groups can also identify and develop partnerships with organizations that can contribute complementary expertise or resources and provide necessary services to the development of small-scale agriculture.

8.3.5 Protection against Unfair Competition

Cotton plays a vital multi-sectoral role in the economies of many developing countries. The role that cotton plays can be greater than it currently contributes, only if major factors inhibiting the growth and development of the industry can be alleviated. The most notable macro constraint in developing countries like South Africa is low international prices caused by the subsidy policy of the developed countries. Agricultural commercialisation is not a smooth and a frictionless process and government policy therefore has a crucial role to play to minimise the risk and to smoothen out the process of commercialisation of the agricultural sector. Therefore, the identification of the policies that will speed and smoothen agricultural commercialisation as well as creating the political environment to get policies implemented requires urgent attention to the following question. What

government actions or policies and regulations are needed to stimulate growth in a market oriented rural economy? In this regard, protection against unfair foreign competition such as dumping, unequal globalisation etc is, *inter alia*, an important role that government can play. Developing countries in particular must retain the right to protect the agricultural system from instability associated with agricultural subsidies.

In addition, without genuine and far reaching subsidy reform, pouring more funds into the cotton sector is not likely to yield sustainable results for poverty reduction in developing countries. The challenge now is to build and consolidate a coalition of developing countries, civil society organizations and enlightened industrialized countries to put effective pressure on the USA and EU to their subsidy policy.

8.3.6 Increasing Value Adding

A key issue for the producers is the need to add value to cotton and other cotton products. It is very important that both commercial and emerging farmers either own a gin or have access to a commercial gin offering contract ginning. The additional value adding drastically increases the overall profitability of farmers. In terms of gin ownership, effective partnerships are of critical importance to the success and sustainability of value adding. The participation of particularly large commercial farmers will play an important role in securing the seed cotton base load required by ginning operation to break-even. Ownership of the gin should, however, happen only after some managerial development and this will probably cause successful small entrepreneurs to become larger ones

Other by-products of the cotton chain for which a strong local market and potential export market exists, for example, oilseeds and animal feed and which can create rural employment are also areas worthy of more exploration.

8.4 Areas for Further Research

The debate of small-scale farmers commercialisation under the South African agrarian reform will continue for the foreseeable future. It is central to the successful integration of small-scale farmer into the commercial economy to realize that not everybody is a potentially successful commercial farmer. For planned and future schemes, particularly under the land reform programme, there seems to be a need for improved criteria for beneficiary selection, guided by the objective of ensuring that the land resource is held equitably and utilized efficiently and effectively for the national benefit. It appears essential that in the process of achieving equitable distribution, identification and selection for allocation should aim at affording access to and use of the scarce land resource to only those with the best prospects and potential of utilizing it effectively and productively.

Discussion/studies of the determinants to market participation and farming business potential cannot be confined to one discipline such as economics only or within the theory of entrepreneurship. Psychology studies, for example, are also crucial in terms of focusing on motives and character traits of (potential) entrepreneur. Studies of this nature appear to need a multidisciplinary approach. Thus, there is a need for a multidisciplinary study that focuses on attributes of a successful entrepreneur and such attributes could be used for the selection of land reform beneficiaries.

Future research studies on beneficiary selection should take cognisance of the non-homogeneity of small-scale farmers as this was revealed by the typological analysis based on farming potential. Again the study revealed that commercialization decreases with an increase in land size. Future research should attempt to determine an optimal viable land size for each typology.

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QUESTIONNAIRE

**INTEGRATION OF EMERGING COTTON PRODUCERS INTO THE
COMMERCIAL AGRICULTURAL ECONOMY**

Note

Note that all information collected will be held in complete confidence, under no circumstances will your name be associated with any specific responses

1. GENERAL INFORMATION

- 1.1 Date of interview
- 1.2 Name of Interviewer.....
- 1.3 Name of Interviewee (**optional**).....

2. DEMOGRAPHICS

2.1 Demographic characteristics of the person interviewed

Are you the head of the household or Spouse? 1 Head 2. Spouse	Gender 1.Male, 2.Female	Age	Formal educational level 1.No schooling 2.Primary education, 3 Secondary education, 4 Tertiary education)	Marital status 1.Married, 2 Divorced, 3.single, 4.widowed	Employment status 1.Employed, 2.unemployed, 3.retrenched, 4.pensioner 5 Other(specify)...

2.2 Demographics characteristics of other household members (*excluding the person you are interviewing*)

Gender 1 Male 2 Female	Age	Education level 1.No schooling 2.Primary educ 3.Secondary educ 4.Tertiary educ	Employment Status 1.Employed 2. Unemployed 3. Pensioner 4. Retrenched 5. Schooling 6 Creche (Still young) 7 Other (specify).....

2.3 Which of the following language are you able to do? (Mark with an X)

Language	Speak	Read	Write	Understand	None
English					

2.4 Were you born in this village/area where you are farming?

1. Yes
2. No

2.5 Indicate your sources of livelihood

Livelihood	Mark with an X	Amount in Rand/year (Estimate)
Crop sales		
Welfare payments (Grants)		
Wage employment (Wage/salary)		
Livestock sales		
Remittances		
Trade and markets (spaza shops, beer brewing, brickmaking etc)		
Other (specify).....		

3 PRODUCTION INFORMATION

3.1 Why are you involved in agriculture? (Tick the main reason(s))

Reasons	Tick
Main source of food for the household	
Main source of income/earning a living	
Extra source of income	
Extra source of food for the household	
I inherited the plot or farm	
Other (specify).....	

- 3.2** Type of Farming
1. Crops - Dryland
 2. Crops - Irrigation
 3. Other (Specify).....

3.3 How many plots/farm do you own?.....

- 3.4** Kind of farm/tenure status
1. Private owner (own land)
 2. Communal land
 3. Leasehold
 4. State land
 5. Other (Specify).....

3.5 How big is your land? (in hectares etc).....

3.6 For how long have you been farming (in years).....

3.7 Do you consider yourself as a commercial farmer?

1. Yes
2. No
3. Uncertain

3.8 What are your future farming intentions?

1. Remain/become a full-time farmer
2. Remain/become a part time farmer
3. Leave farming if I can earn enough money outside farming

3.9 List all the **main summer crops** that you have grown in the following past years

Year	Crop grown	Hectares
1999		
2000		
2001		

3.10 If different crops were grown, what were the reasons for growing them?

.....

.....

.....

3.11 If no different crops grown, what were the reasons?.....

.....

.....

3.12 List your main crops grown last year (2002) (*Here we are interested in knowing the main summer crops that farmers grow e.g. Cotton, maize, wheat etc*)

Crops cultivated	Size of the area planted (in hectares)	Quantity produced (in kg or tons etc)	Quantity sold (in kg or tons etc, if any)	Value of the quantity sold per unit (in Rands)	To whom did you sell your product (i.e.market)	Why did you choose this particular market?	Reasons for growing the crop

3.13 Apart from income derived from farming, does any member of the household have any other form of income which is also used for farming purposes?

1. Yes
2. No

3.14 If yes, please use the following scale to complete the table below

<u>Scale</u>	<u>Code</u>
R100-R500/ month	1
R501-R1 000/month	2
R1 001-R5 000/month	3
R5 001-R10 000/month	4
>R10 000/month	5

Member of household	Source of income (e.g. pension, taxi, teacher, nurse etc)	Code	Amount used for agricultural purposes, if possible (R)
1.			
2.			
3.			
4.			

3.15 Indicate how many of the following livestock do you own?

Livestock owned	Number
Cattle	
Sheep	
Goat	
Pigs	
Donkeys	
Other Specify.....	

4. **COTTON GROWING FARMERS (2002)** – *(if a farmer is growing other summer crops and not cotton move to page 11 section 5, Non cotton growing farmers)*

4.1 How important is cotton production to you and your family? Explain

.....
.....
.....
.....
.....

4.2 For how long have you been growing cotton (in years)?.....

4.3 Will you still continue growing cotton in future?

1. Yes
2. No
3. Uncertain

4.3.1 If yes, do you consider

4. Expanding
5. Staying the same
6. Contract (i.e reduce size of operation)

4.3.2 If the answer to question 4.3 above is Yes/uncertain, why?.....

.....
.....
.....
.....

4.3.3 If the answer to question 4.3 is no, which crop will you grow?

.....
.....
.....

4.3.4 Why do you intend growing that crop?.....

.....
.....
.....

4.4 When do you normally plant cotton?

1. First week of October
2. Mid-October
3. Last week of October
4. First week of November
5. Mid-November
6. Other (Specify).....

4.5 Which cotton seed variety do you normally grow?.....

4.6 Why do you normally grow this variety

1. Less insecticides cost
2. High yield
3. Labor saving properties (e.g. less time spent spraying)
4. Other (specify).....

4.7 How do you cultivate your land?

1. Own tractor
2. Hired tractor
3. Hired draught animals
4. Own draught animals
5. By hand

4.8 Mention the main constraints that you encounter in cotton production?

.....
.....

.....
.....
.....
.....
.....

4.9 In your opinion, what do you think needs to be done to solve these problems?

.....
.....
.....
.....
.....
.....

4.10 Do you buy some of your agricultural inputs?

1. Yes
2. No

4.10.1 If yes, where do you buy them?

.....
.....

4.11 What were the costs incurred in cotton farming?

Items	inputs applied (Mark with an X)	Quantity used (in bags, litres etc)	Costs incurred per year (in Rands)
Cotton seeds			
Fertiliser			
Herbicides and Insecticides			
Labour (wages)			
Water			
Electricity			
Transport costs			
Other (specify).....			
Other (Specify).....			
Other (Specify).....			

4.12 If you spray, how many times do you normally spray cotton?.....

4.13 How is your cotton normally harvested?

1. Hand picked
2. Mechanically harvested
3. Other (specify).....

4.14 If mechanically harvested, who did the harvesting?.....

4.15 What do you do with cotton hay?.....

4.16 Has the growing of cotton affected the production of your **food** crops i.e subsistence crop?

1. Yes
2. No

4.16.1 If yes, please explain how?.....
.....
.....
.....
.....

4.17 Was there any possibility of having more money for better seed and fertiliser *etc* for other crop as a result of growing cotton?

- 1. Yes
- 2. No

4.18 Do you have access to agricultural loans?

- 1. Yes
- 2. No

4.18.1 If yes, where do you get the loan?

- 1. Input supplier
- 2. Bank
- 3. Informal lender
- 4. Other (specify).....

4.18.2 If loan received, what were the loan conditions (repayment arrangement, interest rate *etc*).....
.....
.....

4.18.3 If no loan received, how do you finance your agricultural activities?
.....
.....
.....

5 NON-COTTON GROWING FARMERS

5.1 What was your main summer crop grown last year (2002)?.....

5.2 How important is this crop to you and your family?.....

.....
.....
.....

5.3 For how long have you been growing this crop?.....

5.4 Will you still continue growing this crop?

1. Yes
2. No
3. Uncertain/not sure

5.4.1 If yes, why?.....

.....
.....
.....

5.4.2 If no, which crop do you intend growing?.....

5.4.3 Why do you intend growing that crop?.....

.....
.....

5.5 How do you cultivate your land?

1. Own tractor
2. Hired tractor
3. Hired draught animal
4. Own draught animal

- 5. By hand
- 6. Other (specify).....

5.6 Mention main constraints that you encounter in the production of your main summer crop that you indicated above?.....

.....

.....

.....

5.7 What were the costs incurred in growing you main summer crop?

Items	inputs applied (Mark with an X)	Quantity used (in bags, litres etc)	Costs incurred per year (in Rands)
Seeds			
Fertiliser			
Herbicides and Insecticides			
Labour (wages)			
Water			
Electricity			
Transport costs			
Other (specify).....			
Other (Specify).....			
Other (Specify).....			

5.8 Have you ever grown cotton before?

- 1. Yes
- 2. No

5.8.1 If yes, why did you stop growing cotton?.....

.....

.....

5.9 When was the last time you grew cotton?.....

5.10 Do you have intentions of growing cotton again?

- 1. Yes
- 2. No

5.11 What needs to be done to make you grow cotton again?.....

.....
.....
.....

5.12 Do you have access to agricultural loans?

1. Yes
2. No

5.12.1 If yes, where do you get the loan?

1. Input supplier
2. Bank
3. Informal lender
4. other (specify).....

5.12.2 If loan received, what were the loan conditions (repayment arrangement, interest rate etc)

.....
.....
.....

5.12.3 If no loan received, how do you finance your agricultural activities?

.....
.....
.....
.....

5.13 Do you buy some of the agricultural inputs?

1. Yes
2. No

5.13.1 If yes, where do you buy them from?.....



6 MARKETING INFORMATION

6.1 Do you sell cotton or your main summer crop indicated above?

- 1. Yes
- 2. No

6.1.1 If yes, what did you do with the money that you received from sales?

.....

.....

.....

.....

.....

6.1.2 If part of the money was saved, where did you save the money?

- 1. Bank
- 2. Other (specify).....

6.1.3 How much did you save?.....

6.2 How did you transport your cotton/summer crop to the market?

- 1. Own Transport
- 2. Hired transport
- 3. Other (specify).....

6.2.1 If hired transport was used, how much did you pay?

6.2.2 If own transport was used, what was it?

- 1. Donkey cart
- 2. Bakkie (Pick up)
- 3. Truck/lorry
- 4. Other (specify).....

6.3 How far is the cotton/product market (e.g. cotton gin) from your farm (in km)?.....

6.4 How is the general state of the roads in your area?

- 1. Very good
- 2. Good

- 3. Fair
- 4. Poor
- 5. Very poor

6.5 Besides taking your cotton/summer crop to the market (ginners), what else do you do with the crop?.....

6.6 Do you farm part-time or full-time?.....

6.7 Who spend **most** of the time working on the farm/plot?

- 1. Yourself (i.e. the person you are interviewing)
- 2. Spouse
- 3. Both (i.e. Yourself and spouse)
- 4. Hired labour
- 5. Family members
- 6. Other (specify).....

6.8 Who is responsible for making agricultural decision?

- 1. Yourself (i.e. the person you are interviewing)
- 2. Spouse
- 3. Both (i.e. Yourself and spouse)
- 4. Hired labour
- 5. Family members
- 6. Other (specify).....

6.9 Do you have any **contractual agreements or a guaranteed/ready market** (formal or informal, written or verbal) with any agribusiness company e.g. Clark cotton, Vunisa *etc*?

- 1 Yes
- 2 No

6.9.1 If yes, why did you enter into the contract?

.....

6.9.2 What does the contract stipulates? (Please explain if possible)

.....
.....
.....
.....
.....
.....

6.9.3 Are there any support services (e.g. credit, extension service etc) that the contractor provides you with?

1. Yes
2. No

6.9.4 If yes, list all the support services that the contractor provide you with

.....
.....
.....
.....
.....

6.9.5 Are you satisfied with the support services provided?

1. Yes
2. No
3. Undecided

6.9.6 Who qualifies to sign/negotiate the contract?

1. Yourself (i.e. the person you are interviewing)
2. Spouse
3. Both (i.e. Yourself and spouse)
4. Hired labour
5. Family members
6. Other (specify).....

6.9.7 Who qualifies to receive the income from the contractor?

1. Yourself (i.e. the person you are interviewing)

- 2. Spouse
- 3. Both (i.e. Yourself and spouse)
- 4. Hired labour
- 5. Family members
- 6. Other (specify).....

6.9.8 Are you satisfied with the type of agreement that you have entered into?

- 1. Yes
- 2. No

6.9.9 If not, what's the problem and what do you think needs to be done to solve the problem?

.....
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.....
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.....
.....
.....

6.9.10 If yes, what do you like most about the contract?

.....
.....
.....
.....
.....

6.9.11 How did the contract/guaranteed market affect you with regard to the following?

	Indicate the effect 1. Increased/improved 2. Decreased 3. Nothing changed	If possible, indicate by how much or how it has changed
Employment		
Hours of work		
Household gender relations		
Household food security		
Household income		
Community building		
Other specify.....		

7. LEVEL OF ENTREPRENEURSHIP (circle the numbers)

	Strongly disagree	Disagree	Agree	Strongly agree
7.1 Leadership	1	2	3	4
You are not afraid to try new techniques before your fellow farmers.	1	2	3	4
Before making any major farming decision, you consult or seek for an advice from your family/friends/ or any other relevant information source	1	2	3	4
If you decide to do something on your farm, you will do it and nothing will stop you from doing it	1	2	3	4
Even though people tell you it can't be done, you will have to find it out for yourself	1	2	3	4
7.2 Need for achievement of goals				
If you have a challenge/problem on your farm, you will keep on trying to solve the problem and you will not quit	1	2	3	4
You have the ability to organise the four production factors (land labour, capital and management) in such a way that the goals set for the farm are achieved	1	2	3	4
7.3 Creative skills				
You have the ability to adapt to changes in the farming environment. For instance, if the price of cotton declines and the price of maize increase are you able to change your farming practices in such a way that you can start producing maize.	1	2	3	4
You are always looking for opportunities to increase the profit of your farm (The creation and identification of new	1	2	3	4

markets for products. Have the ability to start growing a new crop, in some cases add value to the crop produced				
7.4 Motivation				
You like supporting and helping your fellow farmers when you see them struggling or when they come to you with problems	1	2	3	4
Crop rotation is a good farming practice	1	2	3	4

7.5 Attitude towards risk. Which one of the following situation will you choose

1. Variety A will give you a profit of R10 000 in two out of ten years and in the other eight years R0 (high profit, high risk)

2. Variety B will give you a profit of R3 000 in six out of ten years and in the other four years R0 (Medium profit, medium risk)

3. Variety C will give you a profit of R2 000 in eight out of ten years and in the other two years R0 (low profit, low risk)

7.6 What do you think is the most important financial strategies you must follow to make a long-term success of your farm

	Not important	Important	Very important
To have sole land rights	1	2	3
Keep production costs low	1	2	3
Must get financial management training before I start farming	1	2	3
My farm must earn a substantial profit for growth	1	2	3

7.7 Do you do any farm budgeting?

1. Yes
2. No

7.8 How important is farm budgeting to you?

- 1. Not important
- 2. Important
- 3. Very important

7.9 Do you know anything about crop rotation?

- 1. Yes
- 2. No

7.10 Do you practice crop rotation?

- 1. Yes
- 2. No

7.11 Do you keep records for all your farming activities?

- 1. Yes
- 2. No

7.11.1 If yes, for what purpose do you keep records?

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7.12 Do you think keeping records is important?

- 1. Yes
- 2. No

7.12.1 If yes, how important is record keeping to you?

	Not important	Important	Very important
Determining financial position			
Decision making and planning			
Other (specify).....			

8. EXTENSION AND ANY OTHER SUPPORT SERVICE INFORMATION

8.1 Indicate the main **source of information** and the **type of information** that you get from each source applicable to you (*Do not read information source to the farmers, let them mention information sources and the type of the information they receive from each source*)

Source	Tick in this box for the relevant information source	Technical information(e.g. pest control, fertilizer use, irrigation)	Financial information	Marketing information
Private extension agent				
Government extension agent				
Radio				
Television				
Books, newspaper, magazines				
Agricultural Research Council				
Co-operative-extension officer				
Input supplier				
Bank /land bank				
No one				
Other (specify).....				

8.2 Which of the above information source is easily accessible?

1. Private extension agent
2. Government extension agent

3. Radio
4. Television
5. Books, newspaper
6. Agricultural Research Council
7. Co-operative extension officer
8. Other specify.....

8.3 How important is the following type of information to you?

	Very important	Important	Not important
Technical information			
Financial management			
Marketing			

8.4 How often do you get agricultural information?

1. Daily
2. Weekly
3. Monthly
4. Once per year
5. None
6. Other (specify).....

8.5 What type of agricultural information would you like to receive more often?

1. Technical information
2. Marketing information
3. Financial information

8.6 Why do you prefer to get that information more often?

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8.7 How would you like to receive the agricultural information that you want?

1. Radio
2. Television
3. Government extension agents
4. Private extension agents
5. Books and magazines
6. Other (specify).....

8.8 Why do you prefer to get the agricultural information through that particular source indicated above?

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8.9 Are you a member of any farmers' organisation or farming committee?

1. Yes
2. No

8.10 Do you get any assistance (or co-operation) from the large commercial white farmers?

1. Yes
2. No

8.11 If yes, how do they assist you?

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8.12 Do you have any suggestion/comments etc regarding cotton/or production of any summer crop?

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**THANK YOU VERY MUCH FOR YOUR COOPERATION AND PARTICIPATION
IN THIS PROJECT**