FACTORS AFFECTING SUSTAINABILITY OF AGRICULTURAL PROJECTS ON POVERTY ALLEVIATION IN GAUTENG PROVINCE, SOUTH AFRICA

BY

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SUBMITTED IN FULFILLMENT OF THE REQUIREMENT

FOR

THE DEGREE OF MASTERS OF SCIENCE IN AGRICULTURAL ECONOMICS

DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

FACULTY OF AGRICULTURE SCIENCE AND TECHNOLOGY

NORTH WEST UNIVERSITY

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NOVEMBER 2012

DECLARATION

I, Justine Fikile Mokgadi, declare that this dissertation, submitted to the North West University, Mafikeng Campus, is my own work and has not been previously submitted to any university. All the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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ABSTRACT

Agriculture has been identified by the government of South Africa to play pivotal role in socio-economic emancipation of rural people and those living in commonages. The government has made commitment to provide agricultural support services in order to increase and promote black entrepreneurs by 5% per annum. Given the socio-economic profile of the South African population and the acknowledgement of the importance of agrarian development in other countries, South Africa started its land reform after democratic government in 1994. Prior 1994, agrarian reform was based on the fact that very few black producers were actively involved in commercial farming.

Attempts to correct this disparity through agrarian reform have led to several challenges such as distribution of land without balancing it with capacity-building programmes and have proven to be unsustainable and costly. Major causes of poor performance of farming based on Small, Medium and Micro Enterprises is lack of capacity in many aspects of running farming as a business and farmers are usually smallholders, producing crops in mixed intercropping, which result in persistent and continuous poor yield in agricultural production leading to poor financial returns and increase in poverty level. Sustainability of agricultural projects are affected by the fact that smallholder farmers do not have acquired knowledge and required skills needed for good management and proper daily operations of the project at technical level and lack of support from the community in buying local products

Gauteng Department of Agriculture and Rural Development (GDARD) invested its efforts on poverty alleviation projects on smallholder farmers who have demonstrated their potentials for agricultural activities and have experienced benefits in the form of government programmes such as CASP (Comprehensive Agricultural Support Programme), Agro-Processing Infrastructure, and Letsema among others. The study has identified the constraints that smallholder farmers face in their agricultural activities and made recommendations to policy makers that will assist smallholder farmers based on their level of participation in the agricultural sector which will assist in creating comprehensive, sustainable and appropriate capacity building models and strategies for agribusiness in order to contribute significantly to the eradication of poverty, reduction of unemployment through agriculture and creation of sustainable and market driven agribusiness in Gauteng Province, South Africa.

There are six hundred and thirty five agricultural projects in Gauteng Province that are practicing intensive and extensive agriculture for vegetable production and supply the formal and informal markets with their produce. However, during the sample survey, only 160 projects were selected for

the survey to identify factors affecting sustainability of agricultural projects on poverty alleviation. The farmers that participated are located in City of Tshwane (20 farmers), West Rand District (60 farmers), Ekurhuleni District Municipality (25 farmers), Sedibeng (15 farmers) and City of Johannesburg (40 farmers).

Data collected was subjected to analysis using SPSS and the regression analysis was used to determine factors affecting sustainability of agricultural projects for poverty alleviation in Gauteng Province, South Africa. The results show that 40% (the majority) of the sampled farmers were between the ages of 50-59 years, while 18% of these farmers never attended school. The results of the study revealed that 65.6% of farmers had a household size of between 4-6 people and generated farm income was less than R200 000 per annum.

The linear regression technique reveals a significant determinants of sustainability of agricultural projects for poverty alleviation are attitude (t=-2.71); impact (t=5.86); farmer participation (t=2.82), educational level (t=2.16); farming experience (t=-2.84,); farming income (t=2.28); land tenure system (t=-2.58); and land acquisition method (t=-3.98).

Key words: Sustainability, attitude, farmers' participation, land tenure and acquisition method, and farming experience

DEDICATION

This thesis is dedicated to my mother Suzan Mummy Mokgadi, who sacrificed much to bring me up to this level but I lost her on March, 2003.

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to everyone who contributed towards the success of this thesis. It would not have been possible without your input, time and support; I really appreciate your help.

Professor O.I Oladele, my supervisor, I would like to thank you for your mentorship, support, motivation and critiques during this study. You really helped me organize my thoughts; it would have been difficult without your help. Be blessed Prof.

North West University Bursary, I am truly grateful for the financial support that you gave me throughout the research period. Thank you for the great assistance, continue with the great job.

To all Gauteng Province Farmers, who gave me their time during data collection, I am thankful and your contribution made it possible for me to compile this paper, it would have been impossible without your willingness to cooperate.

My wife Joan and son Mokgethwa Mokgadi it was painful for the sacrifice I made and spent less time with you and I will never be able to repay your patience, may God richly bless you.

I owe gratitude to a number of colleagues for their continued moral support throughout this project. These are Messrs Maine Mofokeng, Charles Manyaga, Ngoako Ramoipone, Victor Thindisa, Thabiso Mokgadi, and Bontle Mokgadi, Ms Celiwe Kgowedi, and Ria Mgidi,

Finally and obviously not the least, I would like to thank GOD ALMIGHTY for opening up the way for me, you had it all planned. Thank you Lord for the wisdom, guidance and the power to sail through, you made it possible for me.

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LIST OF ACRONYMS

AgriBEE	Agricultural Black Economic Empowerment
AIS	Agricultural Information Services
ACB	Agricultural Credit Board
CASP	Comprehensive Agricultural Support Programme
CDS	Community Development Strategy
DBSA	Development Bank of South Africa
FAO	Food Agriculture Organization
GDARD	Gauteng Department of Agriculture and Rural Development
GPLRO	Gauteng Provincial Land Reform Office
IPCC	Intergovernmental Panel on Climate Change
LRAD	Land Distribution for Agricultural Development
MAFISA	Micro Agricultural Finance Institution of South Africa
MEC	Member of Executive Council
NAMC	National Agricultural Marketing Council
NDA	National Department of Agriculture
PLAS	Proactive Land Acquisition Strategy
SASIX	South African Social Investment Exchange
SONA	State of Nation Address
SPSS	Statistical Package for Social Science
SLAG	Settlement Land Acquisition Grant
SMME	Small, Medium Micro Enterprise
STATS SA	Statistics South Africa
YARD	Youth in Agriculture and Rural Development

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CHAPTER 1

INTRODUCTION

1.1Background of the study

It is the goal of the South African government to see agriculture playing a pivotal role in socio-economic emancipation of the rural people and those living in commonages. The need to increase black entrepreneurs by 5% per year was echoed by the former State President Mr Thabo Mbeki in his 2008 State of the Nation Address. This was coupled with his reaffirmation of the Government's commitment to provide agricultural support services (Mbeki, 2008). The call from the former State President does not only demonstrate the importance of the agricultural sector in the South African economy, but it is also an indication of a broad South African commitment to renewal and non racialism.

In South Africa, the extent of poverty found in rural and urban areas is 70.9% and 28.5% respectively (Makhura and Wasike, 2003). These researchers pointed out that high population density is found in peri-urban areas (50.4%) as opposed to urban areas (49.6%). Although percentages of those in urban areas are dominated by rural immigrants who come to urban areas to seek employment, it is important to note that they add to the percentage of urban poor. Although percentages of those in urban areas are dominated by rural immigrants who come to urban areas to seek employment, it is important to note that they add to the percentage of urban poor.

Given the socio-economic profile of the South African population and the acknowledgement of the importance of agrarian development in other developing countries, South Africa started its land reform after the attainment of democratic government in 1994. Agrarian reform in South Africa was based on the fact that very few black producers were actively involved in commercial farming. Bienabe and Vermeulen (2006) revealed that only 60 000 commercial farmers owned 87% of the total agricultural land and the remaining 13% of agricultural land was utilized or owned by subsistence farmers (NDA, 2001).

Attempts to correct this disparity through agrarian reform have lead to several challenges. Amongst other factors, the emphasis on redistribution of land without balancing it with capacity- building programmes has proven to be unsustainable and costly. About 50% of the land provided has not been producing significant marketable products (CDS, 2007; Kirsten et al, 2005). Bienable and Vermeulen (2006) and CDS (2007) have called for skills development strategies in the small-scale

agricultural sector in South Africa. This call has been confirmed by several experts in different sections of the South African communities (CDS, 2007).

In fact, most of the beneficiaries of the agrarian development movement are becoming poorer than they were before they got involved in the land reform projects (Gundidza, 2008). May and Roberts (2000), who are quoted in the second Quality of Life Survey (QOL) of 1998, indicate that 78% of the beneficiaries are within the category of those whose monthly expenditure is below R476, and 47% are classified as ultra poor citizens.

The South African government has made a commitment to eradicate poverty through land reform programme as the major contributing factor (Groenewald, 2008). The aforesaid programme's commitments were expressed by the formation of grants/products such as Land Redistribution for Agricultural Development (LRAD), Comprehensive Agricultural Support Program (CASP) and Micro Agricultural Finance Institution of South Africa (MAFISA) among others. These programmes are aimed at availing capital resources to the poor, vulnerable, previously disadvantaged and unemployed individuals in order to ensure that they have an opportunity to start their agricultural businesses.

1.2 Problem statement

It is widely believed that one of the major causes of the poor performance of farming based on Small, Medium and Micro Enterprises is lack of capacity in many aspects of running farming as a business. The desktop study reveal that critical success factors for these Small, Medium and Micro Enterprises are therefore capacity, market accessibility, business management skills, adequate support programmes as well as adequate financial injections. Any entrepreneur in this business must have skills in both marketing and management coupled with adequate support systems. The entrepreneur must have passion for farming as well as the patience and resilience needed in successful farming (Mmbengwa, 2009).

Farmers in most of these countries dwell in rural communities, which are characterized by the narrow spectrum of education, mass illiteracy, high level of poverty and poor standard of living (Adedoyin, *et al.*, 1997; Ekong, 2003). The farmers are usually smallholders, producing crops in mixed intercropping, which often result in persistent and continuous poor yield in agricultural production leading to poor financial return causing increase in poverty level. Currently, the income potential of African smallholder arable crop farmers is generally low, which cannot be sufficient to support their livelihoods. This situation has further deepened their poverty condition.

There is an assumption that poverty alleviation strategies deal much with the consequences and remedies of the problems that affect the sustainability of poverty alleviation projects, because, firstly, local people do not have the accurate knowledge and required skills that are needed in the projects for good management and proper daily operation of the projects in the technical level. Secondly, beneficiaries themselves do not have the financial management and marketing skills that are required to ensure continuous income generation in the projects. Thirdly, there is lack of support from the community in buying local products. The above mentioned problems are identified as challenges facing poverty alleviation projects in South Africa's rural communities. (Kganyago, 2008). Gauteng Department of Agriculture and Rural Development (GDARD) has invested its effort on poverty alleviation projects for smallholder farmers who have demonstrated their potentials to agricultural activities while in many instances they have experienced benefits in the form of government programmes such as CASP, agro processing infrastructure and increased agricultural production.

1.3 Aims and objectives of the study

The main aim of the study is to identify specific constraints that smallholder farmers are confronted on their agricultural activities and possible policy recommendation to policy makers for intervention based on farmers level of participation in agricultural sector which will assist in creating comprehensive, sustainable and appropriate capacity building models and strategies for agri-business in order to contribute significantly to the eradication of poverty, reduction of unemployment through agriculture in Gauteng Province, South Africa through creation of sustainable and market-driven agri-businesses.

1.4 Specific objectives

a) To investigate factors affecting sustainability of poverty alleviation projects
b) Assess the impact of agricultural projects on farmers 'livelihoods
c) To identify personal characteristics of respondents
d) To determine farmers attitudes towards agricultural projects on poverty alleviation

1.5 Hypotheses

The main hypothesis of the study is that the institutional and technical factors are affecting sustainability of agricultural projects for poverty alleviation among smallholder and emerging farmers of Gauteng Province. When technical and institutional services are poorly developed, agricultural poverty alleviation projects of smallholder and emerging farmers are likely to be sustainable. Institutional factors are access to markets and finance while technical factors are market information, adequate infrastructure and capacity building. These are factors that will be tested in

order to investigate the extent to which institutional and technical factors affect sustainability of agricultural projects for poverty alleviation.

1.5.1 Null hypothesis

- Institutional and technical factors are affecting sustainability of agricultural projects on poverty alleviation among smallholder and emerging farmers of Gauteng Province.
- Sustainability of agricultural projects on poverty alleviation are mainly affected by educational level, farm size, farm experience and land acquisition method

1.5.2 Alternative hypothesis

- Sustainability of agricultural projects for poverty alleviation among smallholder and emerging farmers of Gauteng Province is not affected by institutional and technical factors.
- Educational level, farm size, farm experience and land acquisition method are not affecting sustainability of agricultural projects for poverty alleviation

1.6 Significance of the study

Agricultural poverty alleviation projects are aimed at empowering disadvantaged community economically and assist them to become independent without relying on government. Despite all the efforts from the government, the researcher would like to find whether they are still stuck in poverty or not. The researcher is interested to find factors affecting sustainability of agricultural poverty alleviation projects in Gauteng Province, South Africa.

The need for capacity building in the agricultural sector has been raised by many researchers (World Bank, 2007; CDS, 2007; Bienabie and Vermeulen, 2006; Murray, 1997). The World Bank (2007) has made similar calls for the African states to invest in human capital in their developmental programmes.

South Africa's commitment to agricultural development has been reiterated through a land reform budgetary increase announced by the Finance Minister in 2008 (Manuel, 2008). This is despite the fact that 50% of land reform projects are in the process of collapse due to a lack of, appropriate skills, understanding of agricultural concepts, inappropriate or inadequate business planning, adequate farming implements, road infrastructures, telecommunications, transport and appropriate education in black owned cooperatives (CDS, 2007; Kirsten et al, 2005; Ortmann and King, 2007; Machethe, 1990, Groenewald, 2003). Grouping of individual farmers, with diverse farming goals or backgrounds and orientation has also added to the above challenges (CDS, 2007). The problems experienced by many agricultural small, micro, medium enterprises (SMME's) in South Africa have

also been cited in other African countries (DBSA, 1999). These are lack of technical knowledge, capacity, effective organization, whilst Pender (2000) highlighted the problem of low agricultural productivity due to limited access to appropriate technology.

South Africa continues to strive for empowerment of those who were denied opportunities under apartheid. The process of empowerment is about giving disadvantaged communities and individuals more choices, and, in the case of agriculture, removing the dualism and fully integrating and democratizing the sector (Kirsten, van Zyl and Vink, 1998). This process is important both for sustainable economic growth and for the alleviation of poverty and inequality. Very few smallholder farmers participate in the markets. A range of impediments for market participation has been identified which include lack of assets, market information and training among others.

The findings of this study should hopefully, if implemented, enhance the sustainability of the agricultural poverty alleviation projects which would ensure that public funds used to finance these projects realise the state's objectives of improving the lives of the projects' members. This will in turn ensure that smallholder farmers are responding positively to the changing dynamics of the market environment in order to increase their incomes generated from their projects and ensuring its sustainability.

1.7 Research question

The main research question is what are the factors that affect sustainability of agricultural projects for poverty alleviation in Gauteng Province of South Africa? The study seeks to propose answers on the following questions:

- What are the factors affecting sustainability of poverty alleviation projects?
- What is the impact of agricultural projects on farmers' livelihoods?
- What are the personal characteristics of the farmers?
- What are farmers' attitudes towards agricultural projects on poverty alleviation?

1.8 Outline of the Dissertation

This study is primarily concerned with factors affecting sustainability of agricultural projects for poverty alleviation in Gauteng Province, South Africa. The study starts in Chapter 1 with a background of the study on agricultural development to address poverty in South Africa. The problem statement, hypothesis, aims and objectives of the study and significance of the study were outlined in this chapter.

Chapter 2 deals with review of literature, it starts by defining sustainability of projects, smallholder and emerging farmers by reviewing role of agriculture in poverty alleviation in South Africa and factors affecting sustainability of agricultural projects and efforts by the South African towards poverty alleviation programmes through agriculture.

Chapter 3 gives an overview of the study area, including its climate, geology and soils as well as demographic characteristics. It outlines the description of the study area and the overall design of the study as well as the rationalization for data collection methods. The chapter describes the research approach employed in the study and explain how questionnaires were administered during the study.

Chapter 4 discusses the socio-economic factors affecting the sustainability of agricultural projects for poverty alleviation.

Chapter 5 is the analysis of the findings and recommendations of the research results conducted in Gauteng Province, South Africa.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature in an effort to explore the current the factors that affect sustainability of agricultural projects for poverty alleviation in Gauteng Province, South Africa. In general, smallholder and emerging farmers experience scarce and diminishing resources, insufficient and inadequate physical infrastructure, lack of basic education and marketing knowledge, lack of organizational support and institutional barriers in marketing (Kherallah and Kirsten, 2001). These factors pose challenges in produce marketing through different marketing channels among these groups of farmers. The chapter starts by defining sustainability, smallholder and emerging farmers and the role of agriculture in poverty alleviation.

2.2 Sustainability

A sustainable project is a project that is in the process to keep itself going without falling, continues without faltering, exhausting the resources which fed it (McKay, Northedge and Sekgobela 1995: 67). Herman Daly in (Bond 2002: 30) defines sustainability as, development that meets the needs of the present without compromising the ability of future generations to meet their own needs. He added that it is a development without growth beyond environmental carrying capacity where development means qualitative improvement. McKay (2000: 125) defines sustainability as development which requires meeting the basic needs of all people and giving everyone the opportunity to satisfy their aspirations for a better life. In Davies (1997: 26) sustainability is defined as the ability of the project to continue to provide a solution to the problem for as long as is required. It is resistant or resilient to stresses and shocks of all kinds. According to Tembo (2003: 27) sustainability is defined as the process of change in which the utilization of resources, the direction of investments, the orientation of technological innovation and exchange and institutional change reflect both future and present needs. It starts with empowering the community to become a development partner thereby assuming ownership leading towards maximum participation from all the stakeholders (Griffin, 1994: 20).

2.3 Concept of smallholder farming

Smallholder farming, as defined by Oettle, Fakir, Wentzel, Giddings and Whiteside (1998), involves households producing agricultural yields on relatively small plots of land. It also involves direct operation by the farmer and makes use of family labour (manual and management), although they are sometimes supplemented by temporary employees. In addition, smallholder farming makes more use of labour (labour intensive) rather than capital, and results in production of small amounts

when compared to large farms (Kirsten and van Zyl, 1998). Under smallholder farming, the family is dependent on the farm for a significant portion of their income. However, Kirsten and van Zyl (1998) clarify that due to their vulnerability to economic and climatic shocks in the agribusiness field, smallholder farmers tend to spread their risk by diversifying into off-farm activities for additional income. Smallholder farms are sometimes known as peasant farms, small-scale farms or family farms.

2.4 Concept of emerging farmers

According to the NDA (2006), 'emerging farmers' is a relatively new term used to define formerly underprivileged farmers who are determined to enter into commercial farming. Such farmers have the potential to expand and are developing into commercial farming, hence, also known as developing farmers (Louw, Madevu, Jordan and Vermeulen, 2007). Although this group of farmers consumes a portion of its produce, it mainly produces for selling. In South Africa, this group of farmers is comprised of black farmers who were formerly denied the opportunity to farm successfully by apartheid. Emerging farmers, like smallholder farmers, are still facing difficulties in penetrating already established markets and have limited resources in production. Kirsten and van Zyl (1998) pointed out that the challenges faced by emerging farmers may persist because the sector is not supported enough. With limited policy support, emerging farmers face difficulties in both production and marketing of agricultural produce.

2.5 Agriculture and Emerging farm Sector in South Africa

Agriculture remains the backbone of the South African economy and sector employs 11% of the labor force with many dependants (NDA, 2003). According to DBSA (2000), agriculture is a cornerstone of rural economies. According to Van Rooyen (1997), agriculture has the potential to contribute significantly to economic development and transformation through stimulation of income and employment. An increase in levels of non-farm activities in the economy provides job opportunities for the rural poor (Kirsten *et al.*, 1998). The emergence of small-scale farms is supported because of intensive utilization of labor and capital, therefore, fulfilling employment and equity goals (Ellis, 1988).

According to Delgado (1999), the small-scale emerging farm sector in South Africa is important in terms of providing employment, human welfare and political stability. Mathonzi (2000), states that households that are commercializing their products and use hired labour, tend to receive increased income. Furthermore, the increased household income generated by commercialization was associated with an improvement in nutritional status for children in the household. This directly

implies that commercialization of emerging farmers can contribute to food security. Low income or poverty results in the food insecurity and the rural poor are the ones who are mostly affected by food insecurity. Emerging farmers should be given appropriate assistance by relevant institutions. Assistance needed by farmers relates to adequate extension services; access to credit; women and youth empowerment; transference of skills related to farm management and marketing and production skills (Moloi, 2008).

2.6 The role of agriculture in poverty alleviation

Between 40 and 50 percent of South Africa's population can be classified as living in poverty (Terreblanche, 2002; Woolard and Leibbrandt cited in FAO, 2004_a) while 25 percent of the population can be categorised as ultra-poor. Although the country is self-sufficient in food production, about 14 million people are said to be vulnerable to food insecurity and 43 percent of households suffer from food poverty (National Treasury, 2003). In rural development literature, agriculture is considered as the best vehicle to reduce rural poverty. In most developing countries, agriculture and agriculture-related activities provide most of the employment in rural areas. The implication is that agricultural workers are poorly paid and that most of the employees in the agricultural sector are unskilled. This also means "that increasing agricultural growth may have a large positive impact on poverty" (Lopez, 2002).

The role of agriculture in the economy is generally acknowledged. However, there is no consensus on the issue of whether agriculture is the most appropriate way to fight poverty in developing countries. One school of thought argues that since the majority of people in most developing countries are in rural areas and most of them are engaged in agricultural production or agriculture-related activities, agriculture is the most effective way to reduce poverty. The second school of thought recognizes the contribution of agriculture to poverty alleviation but attaches more importance to non-agricultural activities (e.g. rural non-farm enterprises and social services), (Machete, 2004). One way to assess the contribution of agriculture to poverty is to look at its share of the total household income.

In a study involving 138 smallholder irrigation farmers in Limpopo Province by Machethe et al. (2004), household income sources were divided into two broad categories of farm and non-farm sources. Farm income included income derived from the sale of farm produce (no livestock income is included as the households did not have any livestock). Non-farm sources included old-age pension, remittances, wages, family business and other sources. Farming is the greatest contributor to household income more than 40 percent of total household income is generated from farming.

Old-age pension is the second most important source of household income with a contribution of about 25 percent to total household income followed by wages contributing about 20 percent to household income. Non-farm income sources as a category contribute more to household income than farming about 60 percent of total household income is from non-farm sources (Machethe et al. 2004).

Reardon and Barrett (2000) explained that smallholder agriculture contributes to poverty alleviation through food price reduction and employment creation. Small farms have the potential of creating employment because they are labour-intensive. This is unlike large farms where machinery is mainly used in production. Rosset (1999) is of the view that small farms imply that more people have access to land; which in turn implies own food production. In addition, more agricultural producers result in increased competition. The price of tradable agricultural goods falls in response to competition and production increases, reducing poverty amongst the consumers.

Small farms provide a more equitable distribution of incomes since small farms allow own production for relatively many households, implying that less will be spent on food purchases (Dorosh and Haggblade, 2003). Further explanation shows that poor households that produce their own food are better off, in terms of income, than those who purchase food. In addition, Reardon and Barrett (2000) explained that many smallholder farmers earn some income through selling their agricultural produce, resulting in an improved welfare for such farmers.

2.7 South African Government's efforts towards poverty alleviation

The Department of Agriculture has committed itself not only to ensuring that black farmers acquire speedy access to land, but also for the acquired land to be used productively, through the provision of support services and training programmes both at the provincial level and municipal level of government. Because of inequalities in access to land and insecure tenure, increasing the volume of the land available to the rural poor for improving their tenure rights is often advocated as an essential component of poverty reduction programme (Moloi,2008).

Subsistence farmers' means of coping with reduction in per capita income, land availability and increasing demand for food have been to bring additional land into cultivation and to reduce fallowing in some cases. According to Makhura (2001), insufficient land constitutes one of the most constraining resources to rural households in South Africa. While acknowledging that some of the households in the sample had access to land for crop production, (Makhura, 2001) concluded that the major problem was the small sizes of their plots. The households with a very small size of

arable land are generally dependent on communal land for agricultural purposes. According to Machete (2004), access to land for production is an essential requirement for the poor to enjoy the benefits of agricultural growth. The access to land through initiatives such as Land Reform is aimed at promoting the smallholder agricultural development.

The South African government initiated the land reform programme in 1994. The reform programme constitutes three components that govern the transfer of land to previously disadvantaged individuals, namely land restitution, land tenure reform and land redistribution, with land redistribution being the core programme (Lyne & Daroch, 2003). It is expected that the land redistribution programme will transfer 30% of South Africa's agricultural land to previously disadvantaged individuals by 2015. The programme was established to alleviate poverty and allow previously disadvantaged individuals to take part in the economic opportunities available in the country through agricultural development (Vink & Van Rooyen, 1996). The programme entails a cash grant offering to households who wishes to purchase commercial farmland from white owners on a "willing buyer, willing seller" basis. During the period 1995 to 2000 land restitution and redistribution together transferred one million hectares of land, or less than 1, 2% of the available area, to beneficiaries.

Most of these transfers were directed to resettlement schemes on low quality land with communal tenure arrangements in order to reach as many beneficiaries as possible, quickly and at reserved cost (Lyne & Daroch, 2003). This is a very low number, taking into consideration the number of hectares that must still be transferred. Most of these first transfers were done through the Settlement/Land Acquisition Grant (SLAG).

2.8 Settlement Land Acquisition Grant (SLAG)

The initial approach adopted by the Department of Land Affairs for land reform was the (SLAG) a system where cash grants of R16 000,00 per household were allocated to previously disadvantaged individuals for farm land purchases. The SLAG programme failed mainly because it was practically impossible for 500 households to be full-time farmers on one farm, as they had to pull funds together in order to be able to purchase unproductive land at high prices (Coetzee & Jooste, 2005) and because it lacked a support package, i.e. infrastructure development funds, credit access and markets (Jacobs, Lahiff & Hal, 2003). The SLAG programme was re-evaluated and in 2001 the Land Redistribution for Agricultural Development (LRAD) was introduced.

2.9 Land Redistribution For Agricultural Development (LRAD)

The Land Reform for Agricultural Development (LRAD) programme is expected to enhance "commercial" agricultural production for the market rather than subsistence production (Maura, Shackleton & Ainslie, 2003). It differs from SLAG in that beneficiaries do not have to be poor to qualify for a minimum grant of R20 000, and beneficiaries who have more savings and who can raise bigger loans to finance their farms, also qualify for larger grants. Beneficiaries should add equity and debt capital totaling at least R400 000 to qualify for a maximum grant of R100 000. The approach symbolizes a different move in the South African government's land redistribution policy, which takes a different path from poverty alleviation and group settlement, but supports settling prospective commercial farmers on their own farms. In its first year, LRAD redistributed approximately one million hectares of farmland in South Africa (Lyne & Darroch, 2004).

The common factor between the SLAG and LRAD is that they are "willing buyer-willing seller" driven. The "willing buyer-willing seller" strategy has for some time now been under scrutiny as it has achieved minimum success and it was one of the core issues addressed in the 2005 Land Summit held at Johannesburg Expo Centre. One of the points raised was that though land becomes available in the marketing on a "willing buyer-willing seller" basis, the land in question in most instances does not correspond with government developmental needs. What is implied by this statement is that most of the land that is available in the market, in most cases does not fit the criteria or the needs of government in terms of location and the type of farming operations that may take place on the farm (Report on the Land Summit, 2005).

2.10 Proactive Land Acquisition Strategy (PLAS)

After the 2005 Land Summit where the whole land reform programme was assessed in terms of its phase and achievements, it was concluded that the "willing buyer-willing seller" approach is delaying the process, thus it was proposed that a proactive strategy should be considered. Therefore, the proactive land acquisition strategy was formed. It is an intervention strategy on a trail basis to accelerate the land redistribution process. The approach deals with two possible alternatives: a needs-based approach and a supply-led approach. The focus is on the government as a lead driver in land redistribution, rather than the current beneficiary-driven redistribution. This means that the government will proactively purchase land and match this with the demand or need for land in a specific area.

2.11 Empirical cases of factors affecting sustainability of agricultural projects

2.11.1 Age

According to Magxinga *et al.*, (2005), as a farmer's age increases, it becomes more difficult to respond to opportunities, including accessing the local market. Age can, to a large extent, also affect the response to modern innovations in farming practices. In a study that investigated the decisions to keep livestock in Limpopo by Ngqangweni and Delgado (2003), it was found that the older households are the ones that are likely to invest in livestock, although it seems unsustainable if agriculture is to be important livelihood source. However, in a study that included all the farm enterprises by Makhura, in 2001, the older farmers were found to be more likely to participate in horticultural market, but tended to sell significantly less as compared to younger farmers (Makhura, 2001).

In the study by Dlova, Fraser and Belete (2004), age is one of the factors that can affect the probability of a farmer being successful in farming. Results from the study concluded that older farmers are less capable of carrying out physical activities while younger ones are capable. In this study, Dlova *et al* (2004), concluded that younger farmers are more ready to adopt modern technology. Thus because younger people may be more adaptive and more willing than older people to try new methods, age is expected to be an influencing factor. Bembridge (1984) also concluded that as farmers get older, they often become more conservative and reluctant to accept risk, they work fewer hours and have fewer non-farm employment opportunities.

2.11.2 Gender

The South African government is currently promoting and advocating the participation and involvement of women in all economic spheres, including agriculture. Land is an important resource in agriculture and the disparities in land ownership have a greater impact on income generation. Argawal (1994 & 1997) argued forcefully that women's ownership of land leads to improvements in women's welfare, productivity, equality, and empowerment. Lack of women's ownership of land feeds into the system whereby women are not regarded as real farmers. This, in turn, limits their access to credit, extension services and access to other inputs (Deere & Doss, 2006).

According to Bembridge (1984), a profile of best farmer characteristics was found and significantly more of the best farmer heads of households were men who were managing the farm. This is also true according to Dlova *et al* (2004), who found that it was expected because males are physically capable of coping with the manual demands of farming practices. Women are also expected to

perform domestic chores in the household. The exclusion of married women from decision-making activities of the farm even though their husbands were not farmers had an impact on the ability of the females to be successful (Dlova *et al*, 2004). This means that males would be more likely to succeed compared to females. A study by Deere *et al., 2005* revealed that there is an existing relationship among land ownership, gender and farm income. In a study by Makhura (2001), female households were positively related with livestock sales and female farmers generally participate in livestock markets more than male farmers do.

2.11.3 Education and Training

The best farmers were the educated and most of them had some vocational training (Bembridge (1984). To be an entrepreneur with parameters that determine the scope of an enterprise in rural situations, the smallholder farmers must be familiarized with the principles of business economics, record keeping and they should become proficient in managerial skills (Nompozolo, 2000). Thus, Dlova *et al* (2004) found that the higher the level of education, the more successful the farmer was. A sound educational background can reinforce natural talent; it can provide a theoretical foundation for informed decisions. Entrepreneurial success requires formalised knowledge of functional aspects like marketing, purchasing, supply chain management and finance (Rwigema and Venter, 2004). Therefore, education is likely to improve managerial ability in terms of better formulation and execution of farm plans; and acquiring better information to improve marketing ability. However, Nompozolo (2000) suggests that education and training should go hand in hand, education being the primary motivator and initiator. Thus, Dlova *et al* (2004) conclude that the probability of a farmer becoming successful improved when the farmer had some type of vocational training. Doni (1997) states that any agricultural development initiative should start with training of the targeted farmers before other support services are provided. Such training should continue through extension support as part of the project implementation.

Education plays a major role in the agricultural industry wherein competition is high between the previously disadvantaged and previously advantaged farmers in the commercial markets. The high level of education amongst the farmers may assist them to understand and interpret market information correctly; have ability to network and communicate their business ideas; to have better general farm management principles and marketing skills; and develop financial intelligence. Several studies have found a direct relationship between the level of education and successful performance in farming (Montshwe *et al.,* 2005; Bizimana *et al.*, 2004; Mintzberg, 1989, and Mohammed & Ortmann, 2005). According to Montshwe *et al.*, (2005), the training received by

small scale farmers was found to have improved the possibility of the farmers to sell livestock which in turn created income for them.

2.11.4 Household size

Normally, the larger the family size, the more likely the farmer is to become successful as the household has more labour to work on the farm. However, this would only work if all family members are old enough to perform the farm work, otherwise if the household size consists of a majority of young children who cannot be used as family labour, it will not work. However, according to Dlova *et al* (2004), farmers with bigger families were less successful than those with smaller family sizes. This situation is explained by the fact that the increased use of the family income to feed, clothe and educate a larger number of children may leave limited funds for meeting farming expenditures because of the high household expenditures.

2.11.5 Access to off farm income

Access to income can affect the probability of a farmer becoming successful (Dlova *et al* 2004). The probability of success in farming should be directly related access to other sources of income. According to Dlova *et al* (2004), those farmers who have access to other sources of incomes made better use of all existing factors of production while farmers who have access to little alternative income under-utilized some of their factors of production due to inadequate operating capital. Bembridge (1984) found out that even though the best farmers derived ten times the income from farming as did average farmers, they were still dependent on outside income for 37% of their gross earnings compared to the 90% in the case of average farmers.

2.11.6 Land

The success of a farmer is affected by the size and quality of the land owned. Categorizing farms by size is a much debated issue. Lau et al (1971) categorize small farms as those less than 10 hectares and big farms are those with more than 10 hectares. Of course bigger farms face many challenges among them is the problem of staff management, which can affect profitability. Farm size is related to the type of farming activity, the intensity of the operation and the capacity of the farmer.

2.11.7 Farm experience

The chance of success is higher for a farmer who has been engaged in farming operations for a number of years (Land Bank, 2011). Enterprise experience is higher in farmers with more farming experience than with those without. Possibly the correlation between farming and enterprise experience suggests that the more experience the farmer has in farming, the more he/she is likely to

adapt to different farming enterprises. Based on the argument that farming experience is a predictor of good farming performance, enterprise experience can also play an important role in smallholder farming. In this regard, experience (at both farm and enterprise level) plays a key role with regard to market access because farmers adapt not only to certain farming techniques but also to information regarding markets. It is clear in this study that farming experience positively influences enterprise experience. Therefore, farming experience is very important in market access (Pote, 2008).

2.12 Factors affecting sustainability of poverty alleviation projects

2.12.1 Market information

Market information is vital to market participation behavior of smallholder farmers. Market information allows farmers to take informed marketing decisions that are related to supplying necessary goods, searching for potential buyers, negotiating, enforcing contracts and monitoring. Necessary information includes information on consumer preferences, quantity demanded, prices, produce quality, market requirements and opportunities (Ruijs, 2002). These are crucial due to the fact that they are the source of market information because they determine accuracy of the information.

According to Montshwe (2006), smallholder farmers have difficulties in accessing market information, exposing them to a marketing disadvantage. Smallholder farmers normally rely on informal networks (traders, friends and relatives) for market information due to weak public information systems (FAO, 2004_b). However, such individuals may not have up to date and reliable market information, making the usefulness of the information doubtful. Additionally, farmers relying on informal networks for market information are at risk of getting biased information due to opportunistic behaviour of the more informed group. For instance, Mangisoni (2006) explained that smallholders usually accept low prices for their crops when the broker informs them that their produce is of poor quality. Smallholder farmers accept these low prices mainly because they are unable to negotiate from a well-informed position.

2.12.2 Traceability and food safety of agricultural products

Consumers demand high quality for the goods they buy. In addition, they will not buy food products unless there is a guarantee that they are safe to eat (Kherallah and Kirsten, 2001). In other words, consumers make purchasing decisions depending on packaging, consistency as well as uniformity of goods. Most smallholder crops have not clearly defined grades and standards and, therefore, cannot meet the consumers' demands (Reardon and Barrett, 2000). Produce from smallholder farmers do not meet certain market grades and standards because the farmers lack the knowledge

and resources to ascertain such requirements. In addition, institutions for determining market standards and grades tend to be poorly developed in smallholder farmers environments. Due to uncertainty on the reliability and quality of their goods, they usually cannot get contracts to supply formal intermediaries such as shops and processors (Benfica, Tschirley and Sambo, 2002). This indicates that only well organized farmers can benefit from trade liberalization by adopting strict quality control measures and obtaining the necessary certification for their goods.

2.12.3 Market access

Technical changes in marketing can be viewed as those transformations that allow goods to be available on the market at lower costs and in a more diversified set of markets (Carre' and Drouot, 2002). Technical changes are usually influenced by factors in the organization itself, public regulation and general advances in technology. In agricultural production and marketing, smallholder farmers tend to be lagging in the use of improved technology (Carre' and Drouot, 2002). Machethe (2004) pointed out that most small producers in South Africa lack appropriate transportation facilities and road infrastructure, communication links and storage. Further, smallholder farmers have limited ability to add value to their produce. Lack of such facilities usually constrains farmers' supply response to any incentives in both agricultural production and marketing (Dorward *et al*, 2003).

Smallholder farmers tend not to be organized in the markets as they usually sell their few agricultural produce surpluses individually and directly to the consumers without linking with to other market actors (Key and Runsten, 1999). In other words, smallholder farmers lack collective action in markets. Individual marketing of small quantities of produce weakens the smallholder farmers' bargaining positions and often exposes them to price exploitation by traders. They also do not benefit from economies of scale (Kherallah and Minot, 2001). Agribusiness firms favour contracts with medium to large-scale farmers, such that individual smallholder farmers cannot be part of these contracting arrangements (Key and Runsten, 1999; Kherallah and Kirsten, 2001). Lack of facilitation in the formation of producers associations or other partnership arrangements makes it more difficult for smallholder producers to participate in formal markets. The greater the degree of organization in the market, the smaller the transaction costs are likely to be and the easier it is to benefit from the exchange opportunity (Frank and Henderson, 1992).

Smallholder farmers are usually served by poor market infrastructure. In some instances, market infrastructure is unavailable and farmers sell from the back of their trucks (Makhura, 2001). These conditions are not conducive for fresh produce, contributing to perishability and loss of produce.

Additionally, produce sold under poor market conditions may not be attractive to consumers, putting farmers at risk of losing customers. Fresh produce tend to have a limited shelf life, therefore, they cannot be stored for longer periods (van Tilburg, 2005). That implies that such produce needs to be processed or to be sold while it is still fresh. When selling them, it is important to be cautious of market place conditions to keep them fresh. Market infrastructure such as sheds and stalls in spot markets is crucial in maintaining freshness of agricultural produce (Wilson *et al*, 1995).

2.12.4 Transport system

The absence of mechanical transport poses serious problems for marketing of agricultural produce. It is difficult to transport produce in time, to the market if there is no reliable private form of transport, since public vehicles tend to be few in the rural areas (Bachmann and Earles, 2000). Inability to transport produce in time may result in produce spoilage and losses. In addition, unavailability of reliable private transport may increase transport costs, which in turn increases transaction costs amongst smallholder farmers (Zaibet and Dunn, 1998). These high costs will then reduce the incentive to move away from the farm gate sales. In South African markets, some farmers use their own vehicles to get to the market centres. Makhura (2001) pointed out that these farmers with transportation vehicles are able to move around in search of more rewarding markets. In addition, those farmers stand a better chance of getting market information from different markets. Thus, farmers who own their own vehicles are more likely to meet many buyers and reach several markets.

In Southern Africa, most smallholder farmers without their own transport usually pack their goods (especially vegetables) in sacks, which are then transported to the market places using public transport (Jayne, Govereh, Mwanaumo, Nyoro and Chapoto, 2002). This leads to bruises and damage and, thus, drastically reduces the quality of the agricultural produce being transported. Additionally, produce transported this way are bought by brokers, where the brokers play an essential role in determining the prices at which the produce is sold. Faced with all these problems, smallholder farmers may opt to sell their products to middlemen at the farm gate or around the villages.

2.12.5 Value addition

According to Robbins (2005), prices of primary agricultural produce have fallen steeply, but retail prices for the same packaged, cut and processed products in industrial countries, have increased. This means that value adding activities can earn farmers additional income. Value adding can be in

the form of grading, sorting, cutting, packaging in standard weights and processing of produce (Mather, 2005). Lack of value adding and agro-processing is part of missing markets amongst smallholder farmers in marketing. Agricultural produce from smallholder farmers usually are poorly packaged. With few exceptions, most smallholder farmers cannot add value to their produce because they do not know its importance and lack processing technology (Louw, Madevu, Jordaan and Vermeulen, 2007). Inability to add value to agricultural produce by smallholder farmers excludes them from interesting markets.

2.12.7 Access to Finance

Until 1998, the government still provided financial assistance through Agricultural Credit Board (ACB) to smallholder farmers. In a case study by Makhura et al (1995) evaluated the conditions of access to ACB in Limpopo which was then known as Northern Province. Almost none of the emerging farmers' loan applications were approved by the ACB due to the farmers' lack of security. The irony was that the black farmers were denied ownership of land, which could be utilized as security. It was clear that ACB finance was not made to meet the needs of these farmers. The government of Republic of South Africa came to realize that access to finance was still the problem for many emerging farmers and their Agricultural Cooperatives. It consequently decided to introduce assistance programmes such as LRAD (Land Redistribution for Agricultural Development) initiatives, Comprehensive Agricultural Support Programme (CASP) and the Micro Agricultural Finance of South Africa (MAFISA). According to Coetzee (2007), commercial banks also provide finance to farmers, but they focus more on established farmers who have collateral. It is considered risky to lend money to emerging farmers with no property rights. Emerging farmers have access to informal money lenders, but they cannot afford the high interest rates. Access to finance and the high costs involved, remains major obstacle for many emerging farmers (Land Bank, 2011).

Access to agricultural credit is an important element in empowerment process and (Kirsten *et al*, 1998, Hedden-Dunkhorst *et al.*, 2001). Moser (1996) referred to credit as one of the accelerators of agricultural development. Access to credit can help farmers to obtain or afford the factors of production. However, there are different factors that affect access to credit by emerging farmers. A number of researchers found different factors that contribute to that. The principles adopted by the formal credit providers make it not easy for emerging farmers to obtain credit (Kirsten *et al.*, 2000; Moyo, 2002; and Spio & Groenwald, 1998). In a study by Lyne (1996), emerging farmers have been found to have limited access to factors of production, credit and information. Furthermore, the study by D'haese and Mdula (1998) in the then Northern Province, now Limpopo Province, found

that lack of access to credit was the main constraint to the emerging farmers to generate more income. According to them, access to credit seems to be the main factors contributing to the various problems the emerging farmers are faced. In the developing regions of former the KwaZulu Natal, Lebowa, Venda and Kangwane, it was found that high transaction costs, low wealth and poor debt servicing capacity impeded use of formal credit (Coetzee, 1995).

Access to credit has long been regarded as one of the key elements in improving agricultural productivity. One of the problems that small scale farmers are faced with is a high interest rate (Machete, 2004). The establishment of parastatal institutions, with a mandate to channel credit to emerging farmers, is one of the approaches used by governments in developing countries to promote smallholder agricultural development. Some of the parastatals that were established in the former homelands of South Africa have collapsed as a result of transformation of agriculture in the country, thus leaving the emerging farmers without access to credit services. Land Bank was expected to fill the vacuum created by the demise of homelands parastatals (Machete, 2004). However, the Land Bank is not able to reach all small farmers with loans since the majority of the emerging farmers still do not have access to credit (Machete, 2004 and Hedden-Dunkhorst *et al.*, 2001). Provision of credit could increase the productivity of farmers given that they could buy inputs recommended for their farming practices. In South Africa, lack of access to credit to purchase inputs restricts small-scale irrigation farmers' production significantly by limiting the farmer's ability to cultivate (Hedden-Dunkhorst *et al.*, 2001).

2.12.8 Climate Change

Climate change is a primary determinant of agricultural productivity and as such, it influences the type of vegetation that can grow in a given season, temperature and location (Woodward, 1987). It directly affects agricultural production, as agriculture is inherently sensitive to climate conditions and is one of the most vulnerable sectors to the risks and impact of global climate change (Parry et al, 1999). Statistical evidence suggests that South Africa has been getting hotter over past four decades, with average yearly temperature increasing by 0.13 Degree Celsius per decade between 1960 and 2003. There has always been an increase in the number of warmer days and decrease in number of cold days and the country's average rainfall is 450 mm per year which is below world average of 860 mm. Climate change may take temperature climb and reduces the rains and change their timing which might put more pressure on to water scarce resource with implication to agriculture, employment and food security (Hasan, 2006).

2.12.9 Management capacity

Management capacity is one of the factors that play an important role in achieving the competitive advantage (Nell and Napier, 2006). The management should have qualities to develop policies such as human resources and a financial operational policy. The management team should also consider delegation of jobs, tasks, activities or actions as a form of building management capacity of the workforce (Nell and Napier, 2006). These authors also recommended that a farmer uses contractors, consultants and advisers as strategy to increase management capacity. It is clear that without a sound financial backup, the farming SMMEs would not be able to build their management capacity without assistance from government. This complements the finding of Van der Walt (2005) that black agricultural cooperatives fail due to poor management capacity, coupled with lack of education. CSD (2007) reaffirmed this by indicating that there are major gaps with respect to management skills in the farming SMMEs formed through land reform.

The capacity of an SMME plays a pivotal role in ensuring the viability and sustainability of the enterprise. Farming SMMEs in South Africa, particularly those formed through land reform, have been heavily constrained by lack of capacity. Kirsten et al (2005) reported that an absence of support, after-care, conflict management amongst the beneficiaries, lack of farming skills and knowledge are common symptoms of lack of capacity.

2.12.10 Storage facilities

The ability to deliver a quality product to the market and ultimately to the consumer, commands buyer attention and gives the grower a competitive edge (Bachmann and Earles, 2000). Proper post harvest handling and storage contribute in ensuring quality maintenance for perishable agricultural produce. Moreover, agricultural commodities have to be harvested at a specific point in time, but are consumed year-round, thus necessitating proper storage facilities (Sasseville, 1988). Therefore, if crops are to be available for consumption throughout the year, proper storage facilities have to be implemented by both farmers and traders. Amongst farmers, storage may have some added advantages because it increases market flexibility. Households with proper storage facilities do not need to market their produce immediately after harvest when prices tend to be low. They can store their produce and sell when prices are higher. Most smallholder farmers do not have access to adequate storage infrastructure and end up selling their produce soon after harvest, also because they need the money involved. Smallholder farmers often rely on open-air storage (Gabre-Madhin, 2001). Due to lack of storage facilities, most smallholder producers are keen to sell produce almost immediately after harvest in order to ease congestion, leading them to sell their produce at lower prices (Wilson, Boyette and Estes, 1995). In studies carried out in Malawi and Benin, Gabre-

Madhin (2001) explained that storage practices are relatively limited in both countries. Further explanation shows that most smallholder farmers rely on open-air storage.

2.13 Impact of agricultural projects on farmers'livelihhod

2.13.1 Income-generating projects

Income-generating projects are programmes developed by the government to make it possible for poverty-stricken people particularly in rural areas to acquire greater control of their destinies. The objectives of income-generating projects are poverty eradication, reduction of unemployment and providing food security, with respective members of the community participating on the programmes such as planting, weeding and harvesting (Capricorn voice 2-4 November 2005). The programmes are aimed at alleviating and eradicating poverty by enabling people who cannot earn a living due to unemployment and disability to manufacture goods with the aim of selling them as a source of income. In that way an income is generated, uplifting the standard and quality of life of the participants and those of their families as beneficiaries of the projects. Planting and growing vegetables, flowers, and trees for selling also generate income as long as there is trade. Income generating projects are people-centred and people-driven development that would not see people as recipients of handouts from the development agency but allow people to take ownership of their development plans (Uphoff et al. 1998: 162). These programmes also reduce the high rate of dependency as participation in social and economic activities leads to a better life.

2.13.2 Promotion of food security

There is powerful evidence of food insecurity in South Africa. Several organisations and scholars confirm the prevalence of food insecurity (Bonti-Ankomah, 2001; Department of Agriculture, 2002; SASIX, 2007). Mgijima (1999), as cited Bonti-Ankomah (2001), noted that 39 percent of the South African population is vulnerable to food insecurity. In addition, 22 percent of South African children under the age of nine suffer chronic malnutrition (Bonti-Ankomah, 2001). SASIX (2007) noted that food insecurity in South Africa is not a result of a non-performing commercial farm sector. Instead more attention is required in strengthening the smallholder farm sector through removal of technical, institutional and entrepreneurial constraints. As such, SASIX (2007) recognize the role of the smallholder farm sector in achieving food security through increased production and productivity. Given the large number of farmers in the smallholder sector, it is crucial to develop the sector (Machethe, 2004).

2.13.3 Employment creation

The smallholder farm sector has been recognised as an important sector in employment creation in South Africa. Delgado (1998), as cited by Machethe (2004), argues that:

"Smallholder agriculture is simply too important to employment, human welfare, and political stability in Sub-Saharan Africa to be either ignored or treated as just another small adjusting sector of a market economy ...."

Nationally, the smallholder farm sector provides employment to at least one million households (Ministry for Agriculture and Land Affairs, 1998). At provincial level, in Limpopo province for instance, smallholder agriculture has been noted to be contributing 25% of the jobs for the economically active population (Limpopo Department of Agriculture, 2008). This implies that where there is active participation in agriculture, there is more gainful employment. In contrast, very little employment is created when agriculture constitutes a smaller proportion to peoples' livelihoods. Such is the case in two rural areas of Eastern Cape Province, namely Guquka and Koloni (Monde, 2003).

2.14 Chapter Summary

The role of agriculture in the economy is generally acknowledged, however, there is no consensus on the issue of whether agriculture is the most appropriate way to fight poverty in developing countries. One school of thought argues that since the majority of people in most developing countries are in rural areas and most of them are engaged in agricultural production or agriculture-related activities, agriculture is the most effective way to reduce poverty as emphasized by Machete (2004). South African government's efforts towards poverty alleviation are playing a significant role towards agricultural programs that are designed to assist smallholder farmers.

Smallholder farmers in South Africa face many challenges that need to be addressed if this sub-sector is to play its rightful role in economic development of the country. Many of the challenges fall beyond the scope of direct intervention by smallholder farmers themselves and require interventions by government and the private sector. It is highly important that smallholder farmers must identify those areas where they could have a direct impact and engage in serious efforts to address such challenges. To overcome the challenges that face smallholder farmers, at the initial stage of business planning the beneficiaries should be provided with the opportunity to participate in the whole process and be involved in marketing plan training before embarking on their agribusinesses.

CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

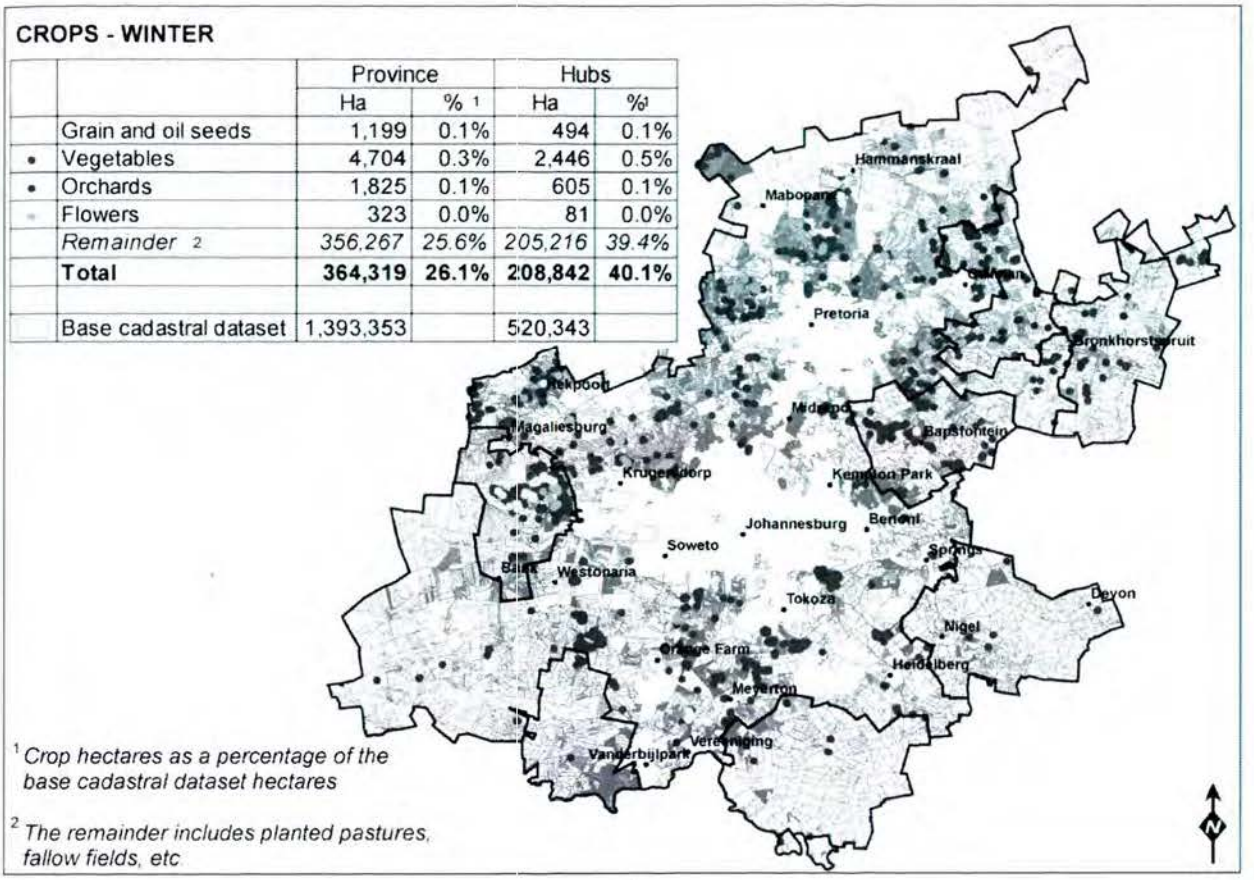
3.1 Introduction

The purpose of this chapter is to provide a clear and detailed description of the research design, methodology and analysis followed in the research. This is a descriptive study involving both quantitative and qualitative research gathered from questionnaires. A descriptive study amongst others attempts to explain the reasons for the characteristics of the population by examining samples of the population (Cooper and Schindler, 2003). The description of the study area is important because it familiarizes one with the area in which the study was carried out. This study was carried out by using a primary data collected from selected smallholder and emerging vegetable farmers from Gauteng Province, South Africa.

3.2 Study Area

Gauteng Province is about 1,699,000 ha in extent being the smallest of all the nine provinces of South Africa. This figure represents about 1.4 per cent of the total national land area. It is however the most urbanized province in South Africa, with 17% of its land area classified as being urban land. Gauteng contains three of South Africa's six metropolitan municipalities, including the Cities of Johannesburg, Tshwane and Ekurhuleni, and three district municipalities and their local municipalities, which form the remainder of the province. Despite being the smallest of the nine provinces, it (Gauteng) is the economic powerhouse of South Africa and presumably, one of the significant contributors to the overall economic out from the African continent (GDARD, 2009).

Figure 3. 1 Gauteng Map



3.3 Climate

The province has average annual rainfall of about 700 mm. Most rainfall occurs between October and March, with a range of about 900 mm in the central higher lying areas to 500 mm in the lower lying northern and southern areas of the province. Mean annual temperature varies from approximately 19.3°C in the north of the province to 16.0°C in the south. The Eastern and Central areas, however, experience a lower mean annual temperature of around 15.0°C. There is large variation between Summer and Winter temperatures, with Gauteng experiencing a daily mean temperature in January and July of 21.2°C and 9.8°C, respectively. As a result of long clear skies at night, little wind and dry air in Gauteng in Winter, Gauteng is frost prone experiencing about 30 days of frost per year on average (GDARD,2009).

3.4 Geology and soils

The present landscape in Gauteng has been influenced by complex past earth processes and geological features that form the basement on which sedimentary and volcanic rocks were deposited millions of years ago. The most widespread geological materials include dolerites, granitites, basalts and a variety of gneisses. Generally, soils in Gauteng are more influenced by rainfall, topography

and parent material than by other soil forming factors. They are lateritic (plinthic), red, yellowish or dark grayish depending on topographic position. The majority of soil types are moderately shallow (25 – 50 cm) to moderately deep (50 – 100 cm) or deep (>100 cm) with minimal development. Their originally high content of organic matter and nitrogen has diminished due to continuous cultivation, As a result most cultivated soils that can be found in Gauteng therefore tend to be generally poorly structured, light (pH 4.0 – 6.5), leached, infertile and susceptible to wind and rain erosion together with other land degradation forms that occur due to leaching and acidification through cultivation and nitrogen fertilization (GDARD, 2009).

3.5 Demographic characteristics

The estimated population of Gauteng is approximately 9.6 million people with a preponderance of females than males. Over 50% of this population is estimated urban dwellers not involved in operative agricultural production. Of this population, about 70% falls between 15 to 64 years of age whilst 26% fall been 1 and 14 years old. The remaining percentage of about 4% are those who are 60 years and above. For their food requirements, this means much pressure is exerted on the existing food production systems most of which are agro based. There are an estimated total of 2.4 million families in the province with an average family size of about 3 to 5 people. However, far less than 50 % of these families are farmers.

3.6 Research Design

In this research study, both quantitative and qualitative research methodology were employed. The combination of the two methods provided the researcher with the necessary data to achieve the objectives of the study. Quantitative research is often an iterative process whereby evidence is evaluated, theories and hypotheses are refined and technical advances are made. Quantitative research using statistical methods typically begins with the collection of data based on a theory or hypothesis, followed by the application of descriptive or inferential statistical methods. This method was combined with qualitative research. The quantitative approach is applicable because the research is concentrated not only in a single project but also on one hundred and sixty agricultural projects in Gauteng Province of South Africa. This type of research approach made it easier for the researcher to be able to engage a large number of respondents and to use them as representation of a broader population of Gauteng Province, South Africa. In addition the researcher found it easier to generalize the findings of the study. Grinnel (1998:21) defines quantitative study as a research, which attempts to describe social reality from an objective standpoint. Quantitative data collection methods often employ measuring instruments. These instruments consist of questionnaires, checklist, indexes and scales. However, the researcher employed questionnaires as a measuring instrument for the research.

3.7 Population of the study

There are six hundred and thirty five agricultural projects in Gauteng Province that are practicing intensive and extensive agriculture for vegetable production and supply the formal and informal markets with their produce. However, during the sample survey, only 160 projects were selected for the survey to identify factors affecting sustainability of agricultural projects on poverty alleviation. The farmers that participated are located in City of Tshwane (20 farmers), West Rand District (60 farmers), Ekurhuleni District Municipality (25 farmers), Sedibeng (15 farmers) and City of Johannesburg (40 farmers).

3.8 Sampling procedure and size

Sampling involves the determination of the sample size giving due cognizance to the fact that it should be representative enough to conduct reliable statistical analysis. Scheaffer, Mendenhall and Ott (1990) define a sample as a collection of sampling units drawn from the sampling frame. In other words, a sample is a finite part of a statistical population whose properties are studied to gain information about the whole.

In a sample survey, a first question that commonly arises is "how large should the sample be?" Casley and Kumar (1988) and Kinnear and Tayler (1987) suggested that a good survey sample should have both a small sampling error and minimum standard error. This can be obtained if one has unlimited resources. However, given constraints, such as finance and time compromises have to be made in selecting the sample size. As a rule, the larger the sample size the higher the reliability, the lower the error and the greater the confidence one can place on the findings reflecting the characteristics of the population as a whole.

The sample was drawn from emerging farmers of Gauteng Province, South Africa. A random sampling technique was employed and as a result, 160 farmers involved in crop production were selected randomly. Interviews were conducted at farmers operational areas in the farm and to avoid bias, sampling was done to farms were production is in progress. A samples of one hundred and sixty (160) respondents were randomly selected from the list of farmers provided by Agricultural Advisors and database from GDARD AIS.

3.9 The questionnaire

A questionnaire was designed as a tool for primary data collection. The questionnaire was then administered to respondents (farmers) through face-to-face interviews. There are other ways in which questionnaires can be administered, such as self-administered questionnaires and telephone

surveys (Leedy and Ormrod, 2004). However, face-to-face interviews were chosen because they have several advantages over the other methods. According to Bless and Smith (2000), an interviewer administered interview is an important tool of data collection because it reduces omission of difficult questions by respondents. In addition, it reduces the problem of word or question misinterpretation (misunderstandings) by respondents and can be administered to farmers who can neither read nor write. In addition, the presence of the interviewer increases the quality of the responses since the interviewer can probe for more specific answers (Leedy and Ormrod, 2004).

3.10 Data collection

The drafted schedule was compiled and the appointments were made by the researcher with respondents (farmers) via the Agricultural Advisors. Respondents were informed about the main aim of the research. The questionnaire consisted of closed-ended questions. These questions that are more specific (hence more likely to communicate similar meanings), they take less time to administer especially in large-scale surveys, and are also easy to analyse (Barribeau, *et al.*, 2005).

3.11 Definition of variables

The dependent variable of this study is sustainability of agricultural project. In this study sustainability of agricultural project refers to a project that is in the process to keep itself going without falling, continues without faltering, exhausting the resources which fed it (McKay, Northedge and Sekgobela 1995: 67). Age of the farmer in table 3.1 has been set as a numerical value, which implies that as the age increases, it will be too difficult to respond to the changes in agricultural environment e.g. inability to take advantage of modern technology. The level of education is categorical which implies that the higher the level of education the more the farmer will be able to negotiate market contract and be able to keep record on each transaction of his/her farming business. Farm income is numerical and categorical which indicates that the higher the income, the more the project will sustain itself and will create jobs. Land tenure system and acquisition method are categorical indicating that if the land is owned by the farmer it can be used as collateral when he/she applies for a loan and can take responsibility of developing it for agricultural purposes.

Table 3. 1 Independent variables used in the model

Variables	Variables description	Expected sign
Age	<39	+
	40-49	
	50-59	

	60-69	
	>70	
Gender		-
	Male	
	Female	
Household head		+
	Male head	
	Female head	
	Child head	
Number of dependents		-
	1-3	
	4-5	
Household size		-
	1-3	
	4-5	
Level of education		+
	None	
	Primary School	
	Middle School	
	Secondary school	
	Tertiary	
Farm income		-
	<200 000	
	201 000-300 000	
	301 000-400 000	
	401 000- 500 000	
	> 500 000	
Labor practices		+
	Family Labor	
	Immediate Family	
	Contract worker	
	Permanent worker	
Land acquisition method		-
	Lease/Rent	

	Private Owner	
	State land	
	Communal land	
Farm size		+
	<10	
	11-20	
	21-30	
	31-40	
Farm experience		+
	< 5 years	
	6-10 years	
	11-15 years	
Land tenure system		+
	Lease/Rent	
	Private Owner	
	State land	
	Communal land	
Source of water		+
	Borehole	
	Municipal water	

3.12 Data analysis

The quantitative data was coded and entered in to a computer for analysis and Microsoft Excel Data Tool was used to capture the data. The Statistical Package for Social Scientists (SPSS version 14) was used to run the data collected from smallholder and emerging farmers in Gauteng Province, South Africa. To analyze data, frequencies, percentage and linear regression were used to test the hypotheses. The main descriptive indicators that were employed were frequencies and percentages. De Vos, Fouche and Venter (2002:223) stated that analysis means the categorizing, manipulating, ordering and summarizing of data to obtain answers to research questions and to test research hypothesis. Data collected for the study were coded and analysed with frequency counts, percentages and multiple regression analysis using Statistical Package for Social Sciences (SPSS version 14). The general form of the regression model is given as follows:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + e_t$$

Where: b_o is constant term

b_1.....b_{13} = coefficients of regression

Y= Sustainability of agric project

X_n=Explanatory variables

X_1= Age

X_2= Gender

X_3=Level of education

X_4=Farming experience

X_5=Farm size

X_6=Household size

X_7= Household head

X_8= Number of dependents

X_9= Farm income

X_{10}= Labor practice

X_{11}=Land Tenure System

X_{12}=Land Acquisition Method

X_{13}= Source of water

e_t = Error term/disturbance term

According to Mohammed and Ortmann (2005), several methods can be used to explain the relationship between dependent and independent variables. Such methods include linear regression models, probit analysis, log-linear regression and discriminant analysis. However, linear regression technique has been chosen because the dependent variable is continuous, linear models such as ordinary least squares (OLS) are used to show the effects of independent variables on the dependent variable. Linear regression model (also known as Ordinary least squares regression (OLS)) is the most widely used modeling method for data analysis and has been successfully applied in most studies (Montshwe, 2006). However, Gujarati (1992) pointed out that the method is useful in analyzing data with a quantitative (numerical) dependent variable but has a tendency of creating problems if the dependent variable is qualitative (categorical).

A significance level of 5 percent is taken as the relative standard in many researches to serve as the basis for accepting or rejecting the hypothesis. The same significance level of 5% was therefore used even in this research such that any deviation from the expected value was due to chance alone 5% of the time or less. This model was used to regress these independent variables in order to obtain their coefficients (beta coefficients) which are necessary in showing how strongly each independent variable influences the dependent variable (Y). Thus, it sought to obtain the beta values

to determine the strength of each independent variable on the dependent variable. A higher beta value represented a great impact of the independent variable on the dependent variable and vice versa. The error term *(U)* encompassed all the variables that could not be assigned numerical values but had an impact on the dependent variable. The significance of the beta values in this model is determined through the t-statistic values.

3.13 Chapter Summary

From the discussion presented in this chapter, it can be concluded that Gauteng Province is occupied by different races of South Africa and foreigners who make the majority population. The areas used for farming are have been identified and protected by GDARD as Agricultural Hub within the Province which comprise of commercial farmers, emerging farmers and smallholder subsistence farmers. The smallholder and emerging farmers in the area mainly farm with vegetables, crop, livestock and a small number involved in citrus farming. Such farmers have a potential to produce for the market although they are faced by marginally developed infrastructure and minimal, usually local markets for their produce.

The methods that were used to analyze data were reviewed. Data was collected randomly from 160 emerging and smallholder farmers Gauteng Province, South Africa. To collect the data, a questionnaire was administered to the respondents through face-to-face interviews. The advantages that are associated with face-to-face interviews have been highlighted within the chapter. For analyzing data, multiple regression model was chosen because the dependent variable is continuous and shows the effects of independent variables on the dependent variable.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter discusses and analyses the results of the field survey that was carried out in Gauteng Province, South Africa between March and June of 2012. The data under analysis was collected from 160 emerging and smallholder farmers who are involved in agriculture and descriptive statistics such as frequencies and its percentage is used.

4.2 Personal characteristics of farmers

Table 4.1 shows that 40% (the majority) of sampled farmers were between the ages of 50-59 years, while those who are less than 39 years account for 10% which indicates that majority of old people are practicing farming in Gauteng Province, South Africa. This poses threat and negative implication to sustainability of agric projects for poverty alleviation because older people are risk averse in the aspects of transformation regarding new technologies and are not strong because agricultural labor requires physically strong individuals. Mayathula-Khoza (2012) stated that the government will continue to support Youth in Agriculture and Rural Development program through capacity building and training and strengthen its support to facilitate partnership with private sector and academic institutions for outreached programmes. According to Dlova, Frazee and Balete (2004), age is one of the factors that affect the probability of a farmer being successful in farming, because younger farmers are more ready to adopt modern technology and may be more adaptive and more willing than older people to try new methods. The study conducted by the Human Resource Council (2009) indicated that, young people are not interested in farming, as it is evidence in the case of this study area. According to Magxinga *et al.*, (2005), as a farmer's age increases, it becomes more difficult to respond to opportunities, including accessing local market.

One of the reasons that account for this age pattern might be that farming is mostly considered as an alternative job for people who are retiring from their lucrative jobs. As a result, the educated, young and active people migrate to the urban areas to seek better employment and do not consider farming as a potential business. However, there is still lack of an entrepreneurship culture currently amongst many black young people; as a result it may take some time before young people consider farming as a viable business. The existing culture is to complete tertiary education and seek employment. Due to the fact that most people consider farming as an alternative job when they are retiring, this may mean that they are not going to invest much in this business due to the fact that they are not driven much by business passion to generate more income. Furthermore, the old farmers, more

especially those with low levels of education cannot easily respond to opportunities and improved ways of production better as the young people would do. As a result, the agricultural productivity would be low due to the fact that old farmers may not easily adopt new ways of production that would enhance productivity. As a result the farm income will remain low (Moloi, 2008). Table 4.1 depicts that gender distribution of smallholder and emerging farmers in the Gauteng Province, South Africa which indicates that male accounts for 49.4% while female 50.6% in agricultural sector of the Province. South African government is currently promoting and advocating the participation and involvement of women in all economic spheres, including agriculture. Land is an important resource in agriculture and the disparities in land ownership have a greater impact on income generation. Argawal (1994 & 1997) argued forcefully that women's ownership of land leads to improvements in women's welfare, productivity, equality, and empowerment. Lack of women's ownership of land feeds into the system whereby women are not regarded as real farmers. This, in turn, limits their access to credit, extension services and access to other inputs (Deere & Doss, 2006).

People with higher educational levels are more able to interpret information than those who have less education or no education at all (Mather and Adelzadeh, 1998). Thus lower education levels of the farmers have an effect on sustainability of agricultural project because they take time to adapt to the changes of marketing environment. In this study table 4.1 has recorded that 23.1% of the respondents have tertiary qualifications while 33.8% posses' secondary school qualifications which indicates that they are able to compete with their counterparts and contribute enormously to the mainstream of Gauteng economy. Farmers who have not attended school are accounting for 18.8%, primary school 15.6% and middle school 8.8% of the sample. This might be attributed by the fact majority of farmers are old and were denied access to education and land. As a result some were given land through Land restitution without necessary skills to utilize it.

Education is one of the fundamental factors that can enable a farmer to easily understand basic farm management, financial management, agricultural marketing principles, and the ability to create business networks. In other words, education level has the ability to improve the competitiveness of the farmer in order to generate farm income. A higher level of education is associated with more knowledge and more access to information. In most instances, farmers with secondary education can easily understand the dynamics of farming for business purposes and can be easily trained, unlike the ones with no education and primary education. Low levels of education, more especially amongst horticultural farmers, is a hindrance to respond to new business opportunities or improved methods of doing farm business and production and, as a result, this negatively affects the farm

income. Furthermore, this may render them less competitive in the current free market system wherein they have to compete on equal footing with their established counterparts. Regardless of the number of efforts that the government is investing in emerging farmers, unless the imbalances of education or training are addressed, the farm income of most emerging farmers is likely not going to change for an extended period. The trend will be that, most of them will be out of business despite the availability of policies such as AGRIBEE. There is a need to invest in human capital, which is one of the basic prime movers of agricultural development (Moloi, 2008). Oladele (2011) reported that experience in farming is important and it comes first with years of experience.

Furthermore the results in table 4.1 shows that majority of farmers who are less than five years farming experience account for 70% while those whose experience is within the farm experience category of 6-10 years records 27.5% and 11-15 years score 2.5% of the total sample. This shows a serious threat to sustainability of agric projects and the participation in agricultural value chain to ensure a balance between market access and market readiness. Farm experience is one aspect that a farmer acquired in his life by undertaking farming activities and can observe either success or failure in farming business. Therefore, this could help them to assess between the performance of a modern and a traditional technology, and to develop more confidence to take risks related to farming. It is also an important factor for success in farming because as farming age increases farmers can gain more information about farming (Petrus, 2010).

Labor is regarded as a crucial factor of production in smallholder farming considering the simplicity of technology in most African countries (Amani, 2004; Taylor and Cairns, 2001). In fact Mushunje, (2001) asserts that labor inputs substitute for capital inputs to a greater extent in smallholder agriculture. The verification by the results of the absence of labor as one of the crucial requirements in smallholder farming is a probable indication that the farmers are resource constrained which can be traced to lack of financial resources to employ labor. This supports by the sample in table 4.1 of this study which indicates that 34.4% of the respondents are utilizing family labor and 57.5% are utilizing contract workers. The labor employed by the sample farmers is obtained from four sources, namely: family, immediate family, contract and permanent workers. The employment of family labor by the majority of farmers is probably linked to the scale of operation, rudimentary technology of production and missing labor markets. Research by Mushunje (2001) and Dorward (1999) suggest that smallholder farming is characterized by usage of family labor. However, the fact that the majority of farmers employ family labor and contract workers might suggest the farming limitations encountered by the farmers in Gauteng Province.

It is also observed in table 4.1 that only 38.1% of the smallholder and emerging farmers interviewed owned and have title deeds to the land they use. When combined together 61.9% of the farmers have the right to use the land they are farming on, through lease or rent, state land and communal land. In other words, the majority (61.9%) of the farmers do not own land. Ownership of land can influence agriculture productivity, because farmers who do not own land can be reluctant to develop and maintain the land (Randela, Liebenberg, Kirsten and Townsend, 2000).

Furthermore, such farmers may experience difficulties to access loans for agricultural purposes because they cannot use the land as collateral, since they do not have title deeds for it. There is no doubt that security of tenure is one of the most crucial factors determining farm development. Farmers who are land secure are willing to learn and take the essential measures which enhance production and productivity (Amani 2004). Amani (2004) further realizes that government ownership of land in most developing countries is the source of land insecurity for most smallholder farmers who believe they possess the traditional right of ownership. Without title deeds, farmers find it difficult to develop the land and may lead to negligence of land conservation and sustainability.

Generally large households' sizes spend more on their families as a result, they may commit less money to purchase inputs, which, in turn negatively affects farm income. On the other hand, large household sizes may have an advantage to be the farm labor. So in that case, this may have a positive impact on the farm income. In this sample presented in table 4.1, high percentage of household size consists of 105 people account for 65.6% of the sample size while families of 55 people account for 34.4%. Farm size has a direct impact on the farm income, the larger farm is expected to generate more income and reduce the cost of production and high demand of labor. The table hereunder shows that majority of the sampled farmers that occupied less than 10 hectares of land accounts for 43.8% and 11-20 hectares respond for 38.8% which indicates that majority of smallholder and emerging farmers are operating small size of land that might limit them in terms of the enterprise. About 50% of the farmers had generated an annual income of less than R200 000 which formed majority of the sample size, while 10.6% generated income between R201 000-R300 000 annually from their farm. Furthermore, 23.8% generate an average annual income between R301 000-R400 000 and 6.3% generate an annual income that is greater than R500 000.

Table 4. 1 Frequency and percentage distribution of farmers by their socio-economic characteristics (n=160)

Variables	Frequencies (N)	Percentages (%)
Age		
<39	16	10
40-49	58	36.3
50-59	64	40
60-69	18	11.3
>70	4	2.5
Gender		
Male	79	49.4
Female	81	50.6
Household head		
Male head	108	67.5
Female head	51	31.9
Child head	1	0.6
Number of dependents		
1-3	136	85.1
4-5	24	14.9
Household size		
1-3	55	34.4
4-6	105	65.6
Highest level of education		
None	30	18.8
Primary School	25	15.6
Middle School	14	8.8
Secondary school	54	33.8
Tertiary	37	23.1
Farm income		
<200 000	80	50
201 000-300 000	17	10.6
301 000-400 000	38	23.8
401 000- 500 000	15	9.4
> 500 000	10	6.3

Labor practices		
Family Labor	55	34.4
Immediate Family	8	5
Contract worker	92	57.5
Permanent worker	5	3.1
Land Tenure System		
Lease/Rent	68	42.5
Private Owner	61	38.1
State land	30	18.8
Communal land	1	0.6
Land acquisition method		
Bought	54	33.8
Inherited	19	11.9
Resettlement	3	1.9
State land	84	52.5
Farming Experience		
< 5 years	112	70
6-10 years	44	27.5
11-15 years	4	2.5
Farming size (hectares)		
<10	**70**	43.8
11-20	**62**	38.8
21-30	**26**	16.3
31-40	**2**	1.3
Source of water		
Borehole	141	88.1
Municipal water	19	11.9

4.3 Farmers' attitude towards agricultural projects on poverty alleviation

Table 4.2 presents farmers' attitudes towards agricultural projects on poverty alleviation. The table indicates that 35% of farmers strongly disagree that they have low level of technical knowledge in agriculture. Technical know-how and capacity facilitate the transformation of traditional agriculture to modern agriculture. Farmers who are equipped with technology (farm machinery and infrastructure), farming techniques and management skills are likely to realize enhanced production

and productivity (Machethe, 2004; Amani, 2004). However, increased production and productivity can be a result of enhanced technical performance emanating from extension advisory services, workshop attendance, financial capacity, market access, and research and development. Farm technology and techniques do not operate in isolation. Increased production and productivity do not only come about as a result of advanced machinery and farm equipment but also through timely inclusion of complementary inputs such as high yielding varieties and agro-chemicals (Amani, 2004).

Table 4.2 shows that 26.9% of farmers strongly disagree that they have low access to information and modern technology. Access to information and modern technology are crucial for sustainability of agricultural projects which assist in understanding why farmers need information and how it can help to improve their productivity and will identify their needs. Provision of access to information and modern technology to farmers ensure that they are provided with right information in order to make right decision and choices to sustain their projects and livelihoods. Many scholars recognize the significance of extension and other support services in achieving enhanced smallholder agriculture production and productivity (Machethe, 2004; Amani, 2004; Ministry for Agriculture and Land Affairs, 1998). According to Amani (2004), extension services play a crucial role by empowering farmers with farming techniques, knowledge and management skills. Furthermore, Umali and Schwartz (1994) assert that extension services assist farmers with information regarding agricultural inventions such as farm production technologies, facilitating farm management, marketing and processing equipment. Machethe (2004) argues that growth in smallholder farming is elusive without support services however, there is no doubt about the importance of extension services.

According to table 4.2, 64.4% of the farmers strongly agree that they are experiencing difficulties to maintain the shelf life of their produce due to lack of equipments and infrastructure. This indicates that there is a large amount of wastage at pre and post harvest stage particularly on highly perishable products and farmers are price takers at this stage and are forced to sell their produce at farm gate. The ability to deliver a quality product to the market and ultimately to the consumer, commands buyer attention and gives the grower a competitive edge (Bachmann and Earles, 2000).

Table 4.2 furthermore, indicates that 53.1% of farmers strongly agree that they are encountering difficulties with market infrastructure. Proper post harvest handling and storage contribute in ensuring quality maintenance for perishable agricultural produce. Moreover, agricultural commodities have to be harvested at a specific point in time, but are consumed year-round, thus

necessitating proper storage facilities (Sasseville, 1988). Therefore, if crops are to be available for consumption throughout the year, proper storage facilities have to be implemented by both farmers and traders. Amongst farmers, storage may have some added advantages because it increases market flexibility. Households with proper storage facilities do not need to market their produce immediately after harvest when prices tend to be low. They can store their produce and sell when prices are higher. Most smallholder farmers do not have access to adequate storage infrastructure and end up selling their produce soon after harvest, also because they need the money involved. Smallholder farmers often rely on open-air storage (Gabre-Madhin, 2001). Due to lack of storage facilities, most smallholder producers are keen to sell produce almost immediately after harvest in order to ease congestion, leading them to sell their produce at lower prices (Wilson, Boyette and Estes, 1995).

According to table 4.2, fifty percent of farmers strongly agree that they are encountering a huge challenge in terms of transport to market their produce which might be attributed by the fact that they are incurring huge costs. The absence of mechanical transport poses serious problems for marketing of agricultural produce. It is difficult to transport produce in time, to the market if there is no reliable transport, since public vehicles tend to be few in the rural areas (Bachmann and Earles, 2000). Inability to transport produce in time may result in produce spoilage and losses. In addition, unavailability of reliable private transport may increase transport costs, which in turn increases transaction costs amongst smallholder farmers (Zaibet and Dunn, 1998). These high costs will then reduce the incentive to move away from the farm gate sales. In South African markets, some farmers use their own vehicles to get to the market centers. Makhura (2001) pointed out that these farmers with transportation vehicles are able to move around in search of more rewarding markets. In addition, those farmers stand a better chance of getting market information from different markets. Thus, farmers who own their own vehicles are more likely to meet many buyers and reach several markets.

Table 4.2 reveals that 43.1% of farmers strongly disagree that they are encountering challenges of access to finance due to collateral. This might be attributed by the fact that the government of the Republic of South Africa has established MAFISA program which is designed to assist resource poor farmers with finance in the form of loan with 8% compound interest rate and is repayable in accordance with a production cycle of the project. This is in contradiction with the study by Larson et al (1994) who find that farmers with lack of collateral in terms of land and other assets normally access credit through informal lender who normally charges higher interest rates. Larson *et al.* (1994) argues that borrowers choose informal financial services because of easy access, variable

loan size, flexible repayment schedule, personal guarantees, convenience and very short period needed to obtain loan approval. Micro Agricultural Financial Institute of South Africa, (MAFISA), plays a similar role to Agricultural Credit Board (ACB) which aims to improve access to credit for smallholder farmers (CSD, 2007).

Table 4. 2 Farmers' attitude towards agricultural projects on poverty alleviation

Name of factor	Variable	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Technical-technological change	Low level of technical knowledge	77 (48.1)	11 (6.9)	3 (1.9)	13 (8.1)	56 (35)
	Low access to information and modern technology	63 (39.4)	28 (17.5)	3 (1.9)	23 (14.4)	43 (26.9)
Managerial challenges	Low quality of products compared to other farming system	28 (17.5)	40 (25)	23 (14.4)	40 (25)	29(18.1)
	Poor labor productivity	41 (25.6)	41 (28.1)	14(8.8)	39(24.4)	21(13.1)
Marketing infrastructural challenges	Difficulties in product storage due to lack of equipments and infrastructure	103 (64.4)	20 (12.5)	4 (2.5)	14(8.8)	19 (11.9)
	Difficulties with market infrastructure	85 (53.1)	24 (15)	3 (19)	22 (13.8)	26 (16.3)
	Difficulties in transportation	80 (50)	29 (18.1)	2 (1.3)	18 (11.3)	30 (18.8)
Access to finance	Collateral	12 (7.5)	19 (11.9)	3(1.9)	57 (35.6)	69 (43.1)
	High interest	7 (4.4)	24 (15)	5(3.1)	65(40.6)	59(36.9)

	rate					

*Figures in parentheses are percentages while those outside are frequencies or (N)

4.4 Impact of agricultural projects on farmers' livelihood

Table 4.3 shows that 50.6% of the respondents indicated that their projects have ability to employ workers. This clearly indicates that agriculture plays a critical role in poverty alleviation and its contribution to job creation must be acknowledged because it is capable of absorbing lot of labor. The smallholder farm sector has been recognized as an important sector in employment creation in South Africa. Delgado (1998), as cited by Machethe (2004), argues that:

"Smallholder agriculture is simply too important to employment, human welfare, and political stability in Sub-Saharan Africa to be either ignored or treated as just another small adjusting sector of a market economy ...." Nationally, the smallholder farm sector provides employment to at least one million households (Ministry for Agriculture and Land Affairs, 1998). At provincial level, in Gauteng Province for instance, smallholder agriculture has been noted to be contributing 4.1% of the jobs which amounted to 132 000 for the economically active population as compared to 2011 (Mokonyane, 2012). This implies that where there is active participation in agriculture, there is more gainful employment.

Furthermore it indicates that 50.6% of the farmers are able to generate income on monthly basis and pay their workers while 49.4% of the respondents are unable to do so. This attributes by the fact that smallholder farmers have been recognized as an important sector in employment creation in South Africa and the government has established lots of programmes to assist smallholder farmers. Small farms provide a more equitable distribution of incomes since small farms allow own production for relatively many households, implying that less will be spent on food purchases (Dorosh and Haggblade, 2003). A further explanation shows that poor households that produce their own food are better off, in terms of income, than those who purchase food. In addition, Reardon and Barrett (2000) explained that many smallholder farmers earn some income through selling their agricultural produce, resulting in an improved welfare for such farmers.

Furthermore, table 4.3 shows that 89.4% of the respondents are food secured, in this study. SASIX (2007) recognise the role of the smallholder farm sector in achieving food security through increased production and productivity. Given the large number of farmers in the smallholder sector, it is crucial to develop the sector (Machethe, 2004). There is no doubt about the potential role of smallholder agriculture in alleviating poverty. Currently, smallholder farmers in Southern Africa produce food for subsistence (Kalibwani, 2005). Taking into consideration that smallholders

produce crops for their own livelihood, SASIX (2007) and Kalibwani (2005) argue that smallholder farmers have the potential to produce marketable surpluses.

Table 4.3 depicts that 81.3% of the farmers agree that training that was transferred to them has augmented their skills while 18.8% disagree. This might be attributed by efforts of GDARD's partnership with various institutions that assist farmers in terms of training to ensure that farmers are up- to- date with the latest technology that will maximize their profit and sustain their projects. The best farmers were the educated and most of them had some vocational training (Bembridge 1984). To be an entrepreneur with parameters that determine the scope of an enterprise in rural situations, the smallholder farmers must be familiarized with the principles of business economics, record keeping and they should become proficient in managerial skills (Nompozolo, 2000). Thus, Dlova *et al* (2004) found that the higher the level of education, the more successful the farmer was. A sound educational background can reinforce natural talent; it can provide a theoretical foundation for informed decisions. Entrepreneurial success requires formalized knowledge of functional aspects like marketing, purchasing, supply chain management and finance (Rwigema and Venter, 2004). Therefore, education is likely to improve managerial ability in terms of better formulation and execution of farm plans; and acquiring better information to improve marketing ability.

Table 4. 3 Impact of agricultural projects on farmers' livelihood

Name of factor	Variable	Yes	No
Sustainable employment	employ workers	81 (50.6)	79 (49.4)
	sustainable employment	72 (45)	88 (55)
	monthly wages	81 (50.6)	79 (49.4)
Income generation	monthly payment	81 (50.6)	79 (49.4)
	sustainable income	78 (48.8)	82 (51.3)
Food security	food provision	143 (89.4)	17 (10.6)
	consistent production	81 (50.6)	79 (49.4)
	food is available	145 (90.6)	15 (9.4)
	sustainable production	83 (51.9)	77 (48.1)
Training and skill transfer	skills augmentation	130 (81.3)	30(18.8)
	Pre-training	132 (82.5)	28 (17.5)
	training relevancy	133 (83.1)	27(16.9)
	training improvement	130(81.3)	30 (18.8)

4.5 Factors affecting sustainability of poverty alleviation projects

Table 4.4 shows that 55.6% of the farmers do not have contractual agreement with agricultural inputs suppliers while 44.4 have the contract. This might implies that due to small hectares of land that are occupied by smallholder farmers, they are unable to purchase input production e.g. seeds and fertilizers in bulk where as agricultural inputs supplies companies sell it in bulk. The table also shows that 54.4% of the respondents are encountering the challenges of agreed quantities of input production with their suppliers and 45.6% are not encountering any challenges. This might be as a result of the fact that they do not have any binding legal document that serves as guidelines of both parties. Furthermore table 4.4 shows that 93.1% of the farmers interviewed are experiencing high transaction costs in relation agricultural input production while 6.9% are not encountering high costs. This might be attributed by lack of contractual agreement for the supply of agricultural inputs which result in smallholder farmers' purchase their inputs through agents on hand shake agreements. Transaction costs also result from contract monitoring and enforcement problems, such as the collection of damages when partners fail to observe their contractual obligations. Monitoring and enforcement costs occur ex post to transaction and are the costs of ensuring that terms of transactions, e.g. quality standards or payment arrangements are adhered to by the other parties to transactions (Hobbs, 1997).

Table 4.4 depicts that 91.3% of the respondents are highly affected with transaction costs and 8.8% are not experiencing high costs of adapting to new technology and innovations. Distance to markets, poor infrastructure and poor access to assets and information result in high business costs. Since smallholder farmers are poor, they find it difficult to compete in lucrative markets due to high transaction costs. Traders with high social capital are better able to enter more capital intensive marketing activities such as wholesaling and long distance transport whereas traders with poor social network face major barriers to entry into more lucrative market segments (Kherallar and Kirsten, 2001).

It is also observed in table 4.4 that 73.1% of the respondents do not have mitigation plans for climatic changes which poses a huge threat to food security as compared to 26.9% who have mitigation plans. Climate change in form of higher temperature, reduced rainfall and increased rainfall variability reduces crop yield and threatens food security in low income and agriculture-based economies which turns to be a serious threat to smallholder farmers whose livelihoods depends largely on rainfall. According to poll results posted on the SA FM (a radio station) website 95% of listeners were of the opinion that the South African media was not giving enough coverage to issues of climate change and global warming, while 5% felt that the media was on track. This

opinion poll was carried out on the 15th of March 2009. The absence of a strategy in this regard may limit the effectiveness of any awareness-raising efforts as there are no clear strategies for reaching out to different groups with targeted messages. Table 4.4 depicts that 76.9% of the farmers are receiving early warning information about climatic change while 23.9 % are not receiving early warning information about the climatic changes. GDARD is doing a good job in terms of information dissemination to farmers on climate changes through study group and have developed strategy for disaster and Agricultural Risk Disaster Management team has been put in place to mitigate the problem.

Table 4.4 further indicates that 57.5% of the farmers are experiencing the challenges of market access due to the fact that they don't have contracts and are on verbal and hand shake agreements while 42.5% are certain about the profit margin because they secured the pre-harvest contract. This might be as a result of several forms of transaction costs e.g. observable (transport, packaging, storage etc) and non observable (information, enforcement, search for partners etc) that the farmer had to undergo. The procurement of agricultural commodities is increasingly bypassing the sport market and procurement deals done on the basis of trust and social networks, black farmers find themselves to be even more excluded. Although the increased procurement of raw commodities from black farmers forms part of the national priorities of South Africa there is no specific vision or policy to promote business linkages (of which contracting arrangements can be part) that include this category of farmer in the country's agro-processing supply chains.

There also appears to be a general reluctance, on the part of agribusiness, to include black small-scale farmers in their supply chains because of the incremental transaction cost (Kirsten & Sartorius, 2002). It again shows that 70% of the farmers have access to market information to make an informed decision about the prices while 30% are unable to access the market information. This is as results of partnership between GDARD and NAMC on provision of market related prices on weekly basis to the farmers. Acquiring information on product prices, price trends and market segments is one of the crucial objective of any farmer who intends to market his/her produce (Ministry for Agriculture and Land Affairs, 1998). Marketing information improves the bargaining power of producers especially when dealing with traders (Ministry for Agriculture and Land Affairs, 1998). However acquiring market information in South Africa, at the right time and place is often a characteristic of commercial farmers due to their ability to access websites, publications and commodity associations. The provision of information to small-scale farmers is one way of maintaining transparency and inclusiveness. According to Schubert (1993) this will make markets

to be more accessible. Bailey *et al.*, (1999) agrees that there is evidence that market information reduces risk.

Table 4.4 shows that 86.9% of the respondents lose their production in post harvesting due to infrastructural problems while 13.1% are not encountering such challenge. Producing for the market calls for production resources that include land, labor forces and capital. Poor access to assets affect the way in which smallholder farmers can benefit from the opportunities in agricultural market particularly in terms of volume of products traded and the quality of these products (Bienabe et al, 2004). Small scale farmers lack consistency in terms of producing for the market due to insufficient access top production resources.

As results 89.4% of the respondents are unable to participate in the market because they do not have physical storages to maintain the qualities of their produce and 10.6% have adequate infrastructure to respond to market demand. This means that the majority of farmers in this survey are unable to compete with their counterparts because they are constraint by storages and cannot respond to market environment which result in high transaction in terms of renting the storage. According to Nkosi and Kirsten (1993), inadequate infrastructure merely takes away from the farmer the limited incentives that are available to them. Lack of physical infrastructure constrains smallholder farmers from accessing the market both in terms of production, quantity and quality as well as accessibility to the market.

The effect of missing/poor infrastructure manifests into high transaction costs which eventually lead to low market participation or recourse to other less profitable marketing arrangements such as direct sales to consumers (Machethe, 2004, Makhura, 2001). Table 4.4 further indicates that 32.5% of the respondents have refrigerated trucks to transport their produce while 67.5% do not have refrigerated trucks and are experiencing a problem of transport. This implies that only 32.5% of the respondents are able to meet market demand in terms of transport while 67.5% will incur high transport costs because they will have to rely on renting vehicles to transport their produce. Most small scale farmers have no means of transport to carry their produce to the markets. Transport problems result in loss of quality and late delivery, which in turn lead to lower prices and this is regarded as the major problem experiencing by small-scale farmers (Louw et al, 2004). An efficient transport system is critically important to efficient agricultural marketing. It is in this context that Thormeyer (1989) argues that, if transport services are infrequent, of poor quality or expensive, farmers won't be timeous and will be exposed to price risk. Thormeyer (1989) also

points out that the level of sophistication of a transport system can improve the mobility of the user and the accessibility of market opportunities.

Table 4.4 indicates that 64.4% of the respondents have been capacitated with aspects of agriculture to respond to market demand while 45.6% have not. GDARD in partnership with other institutions have identified the needs and requirements of the markets and the training is an ongoing process and is demand driven. Technical know-how and capacity facilitate the transformation of traditional agriculture to modern agriculture. Farmers who are equipped with technology (farm machinery and infrastructure), farming techniques and management skills are likely to realize enhanced production and productivity (Machethe, 2004; Amani, 2004). However, increased production and productivity can be a result of enhanced technical performance emanating from extension advisory services, workshop attendance, financial capacity, market access, and research and development.

Table 4. 4 Factors affecting sustainability of poverty alleviation projects

Name of factor	Variable	Yes	No
Production input supply	contractual agreement	71 (44.4)	89 (55.6)
	agreed quantities	73 (45.6)	(54.4)
	high costs	149 (93.1)	11 (6.9)
Climate change	mitigation plans	43 (26.9)	117 (73.1)
	early warning information	123 (76.9)	37(23.1)
Access to markets	have pre-harvest contract	68(42.5)	92(57.5)
Market information	commodity prices accessibility	112 (70)	48(30)
Adequate infrastructure	adequate infrastructure	17(10.6)	143(89.4)
Capacity building	Have you been capacitated with aspects of agriculture to respond to market demand?	103(64.4)	57(35.6)
Mode of transport	refrigerated transport	52 (32.5)	108 (67.5)
Economic factors	costs of technologies and innovation	146(91.3)	14 (8.8)
	Loss of productivity	139 (86.9)	21 (13.1)

4.6 Participation of farmers in agricultural programmes and its effectiveness

The government of the Republic of South Africa has established MAFISA program which is designed to assist resource poor farmers with finance in the form of loan with 8% compound interest rate and is repayable in accordance with a production cycle of the project. Table 4.5 shows that 93.1% of the respondents are participating in MAFISA and supported by 47.5% who indicated that it is very effective and contribute positively to their farms. This is attributed by the fact that MAFISA interest rate is low as compared to other rates charged by different financial intermediaries. MAFISA's aim is to improve access to credit for smallholder farmers (CSD, 2007). Its vision is to empower and improve the livelihoods of the rural working poor, entrepreneurs and farmers within the agricultural sector, by providing micro agricultural financial services on a large, accessible, cost-effective and sustainable basis (Cloete, 2010).

AgriBEE is the program established by the government of Republic of South Africa to promote the entry and participation of black people in the entire agricultural value chain, through provision of funding for equity deals, acquisition of interests in agricultural entities and enterprise development (small, medium and micro enterprise) to the people who were previously marginalized to participate in the economy of South Africa. Table 4.5 further shows that 66.3% of the respondents are participating in AGRIBEE and 58.1% have indicated that it is not effective. This might be contributed by the fact that DAFF and DTI are currently reviewing the BEE scores to ensure that smallholder farmers participate in the main stream economy throughout the entire agricultural value chain. The results are in contradiction with its aim to stimulate growth in agri-business, facilitate development and provide support for enterprise and entrepreneurial development in the agricultural sector, as well as to increase levels of black participation (especially of women and youth) in the ownership and control of the economy (Cloete, 2010).

Land Redistribution for Agricultural Development (LRAD) programme is designed to assist previously disadvantaged citizens, from African, Colored and Indian communities to access land specifically for agricultural purposes, or to make better use of land already accessed. Table 5 indicates that 73.1% of the respondents are participating in LRAD program while 26.9% are not participating which is supported by 42.5% who indicated that the program is very effective. This might be contributed by the fact that private lands are too expensive for the smallholder farmers and government's commitments to address land imbalances in South Africa. The South African government has made a commitment to eradicate poverty through land reform program as the major contributing factor (Groenewald, 2008).This is in line with land reform policy to redress the

historical injustices of the past which is about making land available for agricultural production, settlement and non-agricultural enterprises.

Agricultural Disaster Management Program has been established by the government of Republic of South Africa aims to alleviate the impact of disasters on communal or small scale farmers, emerging and commercial farmers through buffering the detrimental effects that the disasters have upon their production in reducing the vulnerability of these farmers to the impact of future disasters. Eighty five percent of farmers are participating in Agricultural Disaster Management program and the table 5 hereunder indicates that the program is not effective. This might be contributed by the fact there is a limited budget for disaster and the slow response from GDARD in case of unforeseen circumstances. Global climate change threatens the success and pace of agricultural development and consequently of poverty eradication. Rural communities, especially subsistence and upcoming farmers in remote regions, are usually those most vulnerable to climate changes. These people have the fewest resources available and general lack of information poses a further burden in adapting to climate change (Cloete, 2010).

Comprehensive Agricultural Support Programme (CASP) provide post settlement support to the targeted beneficiaries of land reform and to other producers who have acquired land through private means and are, for example, engaged in value-adding enterprises domestically or involved in export. Table 4.5 furthermore, indicates that 98.8% of the respondents are participating in CASP program and supported by 81.3% who indicated that it is very effective and contribute positively to their farms. It aims at availing capital resources to the poor, vulnerable, previously disadvantaged and unemployed individuals in order to ensure that they have an opportunity to start their agricultural businesses. GDARD has ensured that smallholder farmers have access to CASP and compete in the main stream economy of Gauteng Province and through CASP, it plays a significant role to farmers by ensuring that all support services are in place to assist farmers (GADS 2006).

Agro processing program has been established by the government of Republic of South Africa to assist smallholder and emerging farmers with the provision of marketing infrastructure along the value chain which includes cold storage, washing and grading facilities among others. Table 4.5 shows that 96.3% of the farmers are participating in agro processing program and this is supported by 60% of the respondents who confirms its effectiveness to their farms. This might be the contribution of GDARD's effort to assist smallholder farmers with agro processing resources to add

value to their produce to respond to the marketing environment. There is a need to adopt a value chain approach in the provision of government support to primary producers which must be linked to downstream opportunities in agro-processing. Evidence suggests that SMME processors use rudimentary technologies in their business activities, which hampers their performance and competitiveness. Access to the latest and appropriate processing technologies becomes crucial for SMME development (GDARD and DAFF Agro processing strategy 2007).

Table 4. 5 Participation of farmers in agricultural programmes and its effectiveness

Agricultural Programmes	Participation in programmes		Effectiveness of the programmes		
	Yes	No	Very effective	Effective	Not effective
MAFISA	149 (93.1)	11(6.9)	76 (47.5)	28 (17.5)	56 (35)
AGRIBEE	106 (66.3)	54 (33.8)	37 (23.1)	29 (18.1)	94 (58.1)
LRAD	117 (73.1)	43 (26.9)	68(42.5)	32(20)	60 (37.5)
Agricultural Disaster Management	136 (85)	24(15)	10 (6.3)	71 (44.4)	79 (49.4)
CASP	158 (98.8)	2(1.2)	130(81.3)	21(13.1)	9(5.6)
Agro processing	154(96.3)	6 (3.8)	21 (13.1)	96(60)	43(26.9)

Table 4.6 presents results of multiple regression analysis between sustainability of projects and socioeconomic characteristics of farmers. The F value = 39.308, p=0.000 shows that there is a significant relationship between independent variables and sustainability of projects. The R value =0.908 shows a strong correlation between independent variables and sustainability of projects. The independent variables were able to explain 82.5% of variation in the sustainability of projects. Out of 17 independent variables, eight were significantly related to sustainability of projects. These are attitude ($t=-2.71, p<0.05$); impact ($t=5.86, p<0.05$); farmer participation ($t=2.82, p<0.05$), educational level ($t=2.16, p<0.05$);farming experience ($t=-2.84, p<0.05$); farming income ($t=2.28, p<0.05$); land tenure system ($t=-2.58$, $p<0.05$); and land acquisition method ($t=-3.98, p<0.05$).Attitude, farming experience, land tenure system and acquisition method were inversely related to sustainability of projects indicating that a decrease in this variables will lead to increase of sustainability of agric project. A unit change in farmers' participation will lead to 11.2% increase of sustainability of agric projects similarly a unit change in educational level and income will lead to 13.9% and 20.3% respectively change in sustainability of agric projects. The results of the study is in contradiction to

Oladele et al (2009), who found that the farm size and education make a statistical significant contribution in explaining sustainable funding among farmers. According to Kanwar (1998), education has an unclear effect on sustainability of agriculture and the reason given was that the educated farmers normally tend to downgrade farm labor (Naidoo 1997). High education therefore does not translate into high supply of farm labor especially when it is not possible for educated farmers to work off farm due to lack of opportunities and quality of education obtained (Kanwar,1998). Awuyo conducted a study on the participation in informal markets and found that independent variables related to participation were regional location of the respondents, other economic factors that farmers are involved in, proximity to markets and literacy level.

Table 4. 6 Multiple regressions showing relationship between sustainability of projects and farmers socio economic characteristics

Variable	B	Standard error	Beta	t	Sig
Constant	22.443	3.084		7.278	0.00
Attitude	-3.73E-02	0.014	-0.253	-2.717	0.007*
Effectiveness	2.637E-02	0.100	0.015	0.263	0.793
Impact	0.285	0.49	0.430	5.865	0.000*
Participation	0.430	0.153	0.112	2.818	0.006*
Age	8.677E-02	0.214	0.020	0.405	0.686
Gender	-0.126	0.374	-0.016	-0.337	0.736
Level of education	0.378	0.175	0.139	2.157	0.033*
Farming experience	-0.279	0.098	-0.167	-2.838	0.005*
Farm size	-2.33E-02	0.027	-0.042	-0.865	0.389
Household size	-0.100	0.185	-0.026	-0.541	0.590
Household head	0.412	0.372	0.053	1.108	0.270
Number of dependants	-7.83E-02	0.200	-0.018	-0.0392	0.696
Farm Income	0.621	0.272	0.203	2.279	0.024*
Labor practices	9.042E-02	0.219	0.022	0.0412	0.681
Land tenure system	-0.549	0.213	-0.107	-2.581	0.011*
Land ownership	-0.487	0.122	-0.171	-3.982	0.000*
Water source	-0.761	0.494	-0.062	-1.540	0.126
R	0.908				

R square	0.825				
F	39.308				
P	0.000				

*** Significant at 0.05%**

Table 4.7 presents results of multiple regression analysis between farmers' attitude towards agric projects and socioeconomic characteristics of farmers. The F value = 53.847, p=0.000 shows that there is a significant relationship between independent variables and farmers' attitude towards agric projects. The R value =0.926 shows a strong correlation between independent variables and farmers' attitude towards agric projects. The independent variables were able to explain 85.8% of variation in farmers' attitude towards agric projects. Out of 17 independent variables, six were significantly related to sustainability of projects. These are effective (t=-3.129,p<0.05); impact (t=-3.380,p<0.05); farmer participation (t=2.731,p<0.05), age (t=-1.958,p<0.05); educational level (t=-1.858,p<0.05); and farming income (t=0.000,p<0.05). Effective, impact, age, educational level and farming income were inversely related to farmers' attitude towards agric projects indicating that a decrease in these variables will lead to increase of farmers' attitude towards agric project. A unit change in farmers' participation will lead to 9.5% increase in farmers' attitude towards agric projects. This results is in contradiction with the findings of Sedati et al (2010) who found that young farmers with less experience had more positive attitudes towards organic farmers and whatever their age and experience were increased, their attitudes became more negative and therefore there are a negative relationship between age and experience with attitude towards organic farming. This was supported by Caswell et al. (2001) and Tjornhom (1995) who find that there is a negative relationship between age and acceptance of innovation.

Table 4. 7 Multiple regressions showing relationship between farmers' attitude towards agric projects and socio economic characteristics

Variable	B	Standard error	Beta	t	Sig
Constant	166.103	12.648		13.133	0.000
Effectiveness	-1.851	0.591	-0.159	-3.129	0.002*
Impact	-0.963	0.285	-0.214	-3.380	0.001*
Participation	2.474	0.906	0.095	2.731	0.007*
Age	-2.524	1.289	-0.085	-1.958	0.052*
Gender	-0.693	2.276	-0.013	-0.305	0.761
Level of education	-1.962	1.056	-0.106	-1.858	0.065*
Farming	-0.584	0.597	-0.051	-0.978	0.330

experience					
Farm size	-0.131	0.164	-0.035	-0.798	0.426
Household size	1.292	1.124	0.049	1.150	0.252
Household head	-2.980	2.252	-0.057	-1.323	0.188
Number of dependants	-1.357	1.213	-0.046	-1.119	0.265
Farm Income	-10021	1.433	0.483	-6.994	0.000*
Labor practices	-0.758	1.334	-0.028	-0.568	0.571
Land tenure system	-6.24E-03	1.296	0.000	-0.005	0.996
Land ownership	0.354	0.744	0.18	0.476	0.635
Water source	-2.689	3.003	-0.032	-0.896	0.372
R	0.926				
R square	0.858				
F	53.847				
P	0.000				

* Significant at the 0.05%

Table 4.8 presents results of multiple regression analysis between impact of agricultural project on farmers' livelihoods and socioeconomic characteristics of farmers. The F value = 29.995, p=0.000 shows that there is a significant relationship between independent variables and impact of agricultural project on farmers' livelihoods. The R value =0.878 shows a strong correlation between independent variables and impact of agricultural project on farmers' livelihoods. The independent variables were able to explain 77% of variation in impact of agricultural project on farmers' livelihoods. Out of 17 independent variables, four were significantly related to impact of agricultural project on farmers' livelihoods. These are effective ($t=4.190, p<0.05$); labor practices ($t=2.604, p<0.05$), land acquisition method ($t=-2.160, p<0.05$) and attitude ($t=-3.380, p<0.05$).Attitude and acquisition method were inversely related to impact of agricultural project on farmers' livelihoods indicating that a decrease in this variables will lead to increase on impact of agricultural project on farmers' livelihoods. A unit change in effectiveness of agricultural program will lead to 26.4% increase on impact of agricultural project on farmers' livelihoods similarly a unit change in labor practices method will lead to 15.8% respective change in impact of agricultural project on farmers' livelihoods. The results of the study is similar to findings of Machete and Ortman (2003) who find that insufficient security of land tenure is considered to be obstacles of agricultural development in which the type of land used by smallholder and emerging farmers is owned by the state. The positive impact of land type implies that a farmer who owns the

land will be able to generate more farm income compared to the farmer that use of rental, communal or state land. Spio (2002) and Mahabile *et al.*, (2004), found similar results. It is easier for the farmers to invest on their own land than in rented or communal land. Private farms whose tenure is secured have a stronger incentive to invest in fixed improvements as they have a much higher probability of internalizing the benefits of their investments.

Table 4. 8 Multiple regressions showing relationship between impact of agricultural projects on farmers' livelihoods and socio economic characteristics

Variable	B	Standard error	Beta	t	Sig
Constant	29.290	4.710		6.219	0.000
Effectiveness	0.683	0.163	0.264	4.190	0.000*
Participation	-0.168	0.262	-0.029	-0.642	0.522
Attitude	-7.69E-02	0.023	-0.345	-3.380	0.001*
Age	-0.357	0.368	-0.054	-0.970	0.334
Gender	7.265E-02	0.643	0.006	0.113	0.910
Level of education	0.403	0.300	0.98	1.343	0.182
Farming experience	0.235	0.168	0.93	1.395	0.165
Farm size	-2.20E-02	0.046	-0.26	-0.475	0.635
Household size	0.136	0.319	0.023	0.427	0.670
Household head	0.847	0.636	0.073	1.332	0.185
Number of dependants	0.242	0.344	0.037	0.704	0.482
Farm Income	0.128	0.469	0.028	0.272	0.786
Labor practices	0.960	0.369	0.158	2.604	0.010*
Land tenure system	-0.294	0.365	-0.038	-0.804	0.423
Land ownership	-0.447	0.207	-0.104	-2.160	0.032*
Water source	-0.844	0.848	-0.46	-0.995	0.321
R	0.878				
R square	0.770				
F	29.995				
P	0.000				

* Significant at 0.05%

Table 4.9 presents results of multiple regression analysis between farmers' participation on agricultural programs and socioeconomic characteristics of farmers. The F value = 2.523, p=0.002 shows that there is a significant relationship between independent variables and farmers participation on agricultural programs. The R value =0.469 shows a strong correlation between independent variables and farmers participation on agricultural programs. The independent variables were able to explain 22% of variation in farmers' participation on agricultural programs. Out of 17 independent variables, two were significantly related to farmers' participation on agricultural programs. These are effectiveness of agricultural programs ($t=4.984, p<0.05$); and attitude ($t=2.731, p<0.05$). A unit change in effectiveness of agricultural programs will lead to 56.6% increase of farmers' participation on agricultural programs. Attitude was inversely related to farmers' participation on agricultural programs indicating that a decrease in this variable will lead to increase on farmers' participation on agricultural programs. Chambers (1994) agree with both collaborative and partnership on view of participation as a linear continuum reaching from projects with a low level of participation to projects with high degree of participation, implying that it is possible, desirable and necessary to move across this continuum to the most intense form of participation.

Table 4. 9 Multiple regressions showing relationship between farmers' participation in agricultural programs and their socio economic characteristics

Variable	B	Standard error	Beta	t	Sig
Constant	5.522	1.626		3.395	0.001
Attitude	2.003E-02	0.007	0.521	2.731	0.007*
Effectiveness	0.253	0.051	0.566	4.984	0.000*
Impact	-1.71e-02	0.027	-0.099	-0.642	0.522
Age	0.150	0.117	0.131	1.282	0.202
Gender	-9.13E-03	0.205	-0.004	-0.045	0.965
Level of education	4.028E-02	0.096	0.057	0.419	0.676
Farming experience	-4.00e-02	0.054	-0.092	-0.743	0.459
Farm size	-2.29E-02	0.015	-0.158	-1.565	0.120
Household size	1.132E-02	0.102	0.11	0.111	0.911
Household head	0.101	0.204	0.050	0.497	0.620
Number of dependants	-3.05E-03	0.110	-0.003	-0.28	0.978

Farm Income	0.205	0.148	0.257	1.381	0.169
Labor practices	0.151	0.120	0.143	1.262	0.209
Land tenure system	-5.72E-03	0.117	-0.004	-0.049	0.961
Land ownership	8.491E-02	0.067	0.114	1.275	0.204
Water source	4.627E-03	0.271	0.001	0.017	0.986
R	0.469				
R square	0.220				
F	2.523				
P	0.002				

*** Significant at 0.05%**

Table 4.10 presents results of multiple regression analysis between effectiveness of agricultural programs and socioeconomic characteristics of farmers. The F value = 15.843, p=0.000 shows that there is a significant relationship between independent variables and effectiveness of agricultural programs. The R value =0.800 shows a strong correlation between independent variables and effectiveness of agricultural programs. The independent variables were able to explain 63.9% of variation in effectiveness of agricultural programs. Out of 17 independent variables, seven were significantly related to effectiveness of agricultural programs. These are farm size ($t=1.981, p<0.05$); household head ($t=-2.498, p<0.05$); labor practices ($t=-2.235, p<0.05$), attitude ($t=-3.129, p<0.05$); impact ($t=0.000, p<0.05$); farmers' participation ($t=4.984, p<0.05$) and land acquisition method ($t=-3.98, p<0.05$).Attitude, labor practices, and household head were inversely related to effectiveness of agricultural programs indicating that a decrease in this variables will lead to increase of effectiveness of agricultural programs. A unit change in farmers' participation will lead to 26.2% increase of effectiveness of agricultural programs similarly a unit change in land acquisition method and farm size lead to 13% and 13.5% change in effectiveness of agricultural programs. A number of studies by different researchers have indicated that an increase in farm size has lead to an increase in farm income, which also affirms the authenticity of this finding (Makhura, 2001, Spio, 2002; Mathonzi, 2000; and Mbowa & Nieudwoudt 1999). Furthermore, in a study by Bester *et al* (1999), farm size had a positive impact on the usage of Farmer Support Programme (FSP). Economies of scale can be enjoyed by any farm expanding its scale of production.

Table 4. 10 Multiple regressions showing relationship between effectiveness of agricultural programs and farmers socio economic characteristics

Variable	B	Standard error	Beta	t	Sig
Constant	3.746	2.551		1.469	0.144
Attitude	-3.46E-02	0.011	-0.403	-3.129	0.002*
Impact	0.160	0.038	0.414	4.190	0.000*
Participation	0.585	0.117	0.262	4.984	0.000*
Age	-7.81E-02	0.179	-0.031	-0.437	0.662
Gender	0.386	0.310	0.084	1.245	0.215
Level of education	-6.34E-02	0.146	-0.040	-0.434	0.665
Farming experience	-3.97E-03	0.082	-0.004	-0.048	0.961
Farm size	4.391E-02	0.022	0.135	1.981	0.050*
Household size	-5.91E-03	0.154	-0.003	-0.038	0.97
Household head	-0.758	0.303	-0.168	-2.498	0.014*
Number of dependants	-0.146	0.166	-0.058	-0.878	0.382
Farm Income	0.104	0.227	0.058	0.457	0.648
Labor practices	-0.401	0.180	0.171	-2.235	0.027*
Land tenure system	0.255	0.176	0.85	1.451	0.149
Land ownership	0.215	0.100	0.130	2.145	0.034*
Water source	0.307	0.411	0.43	0.746	0.457
R	0.800				
R square	0.639				
F	15.843				
P	0.000				

* significant at the 0.05%

4.7 Chapter Summary

This chapter has presented the descriptive results for factors affecting sustainability of agricultural projects for poverty alleviation in Gauteng Province of South Africa. The gender distribution of the sampled farmers shows that females are dominant than males. It has discovered that the majority

(40%) of smallholder farmers is within the age category of 50-59 years and the educational level is generally low.

Based on evidence in this chapter, it can be concluded that smallholder farmers in Gauteng Province are constrained by the challenges of farm size, land ownership, age and farming experience among others. This poses a serious threat for institutional arrangements e.g. financial institutions that might require land to be utilized as collateral when accessing loan and to farmer himself or herself to develop that land that he leases might think otherwise for beneficial purposes in a long run. It is evident in this study that due to high transaction costs that smallholder farmers encountered, they may not have access to the same technology, information, asset base, input suppliers and profitable market outlets as farmers with lower transaction costs.

Efforts by GDARD has to be acknowledged in provision of agricultural program assistance to smallholder farmers of Gauteng Province through its policies such as CASP, MAFISA, Agro processing and Litsema among others have benefited some smallholder farmers. These policies have not benefited all due to budgetary constraints and not sufficiently addressing challenges encountering by smallholder farmers. The results of this study clearly show that GDARD is gradually doing well in terms of addressing challenges affecting sustainability of agricultural projects through its programmes.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

It is the goal of South African government to see agriculture playing a pivotal role in socio-economic emancipation of the rural people and those living in commonages. In his presidential state of address in 2008, the former state president Mr Thabo Mbeki mentioned that there is a need to increase black entrepreneurs by 5% per year which was reaffirmed by government's commitment to provide agricultural support services. The call from former state president does not only demonstrate the importance of agricultural sector in South African economy, but also an indication of broad South African commitments to renewal and non racialism. South African government started its land reform after attainment of democratic rule in 1994 and made a commitment to eradicate poverty. This was expressed through formation of grants/products such as Land Redistribution for Agricultural Development (LRAD), Comprehensive Agricultural Support Programme (CASP) and Micro Finance Institution of South Africa (MAFISA) among others. These programmes are aimed at availing capital resource to poor, vulnerable, previously disadvantaged and unemployed individuals in order to ensure that they have an opportunity to start their agricultural business.

The general objective of the study was to identify constraints that smallholder and emerging farmers of Gauteng Province are confronted with in agricultural activities; and also to make possible recommendations to policy makers that will assist these farmers based on their level of participation in agricultural sector. Emphasis is placed on the best way to support smallholder and emerging farmers to address factors affecting sustainability of agricultural poverty alleviation project in Gauteng Province of South Africa. The first specific objective was to investigate factors affecting sustainability of poverty alleviation projects, second specific objective was to assess the impact of agricultural projects on farmers' livelihoods while the third objective was to identify personal characteristics of the respondents and the last specific objective was to determine their attitudes towards agricultural projects on poverty alleviation. The main research hypothesis of this study was that the institutional and technical factors are affecting sustainability of agricultural projects for poverty alleviation among smallholder and emerging farmers of Gauteng Province. When technical and institutional services are poorly developed, agricultural poverty alleviation projects of smallholder and emerging farmers are likely to be sustainable. Institutional factors are access to markets and finance while technical factors are market information, adequate infrastructure and capacity building.

There is an assumption that poverty alleviation strategies deal much with the consequences and remedies of the problems that affect the sustainability of poverty alleviation projects, because, firstly, local people do not have the accurate knowledge and required skills that are needed in the projects for good management and proper daily operation of the projects in the technical level. Secondly, beneficiaries themselves do not have the financial management and marketing skills that are required to ensure continuous income generation in the projects. Thirdly, there is lack of support from the community in buying local products. The above mentioned problems were identified as challenges facing poverty alleviation projects in South Africa's rural communities (Kganyago, 2008).

5.2 SUMMARY

This section summarizes all the chapters that are included in the study, which include the literature review, the methodology and the study results.

5.2.1 Literature review

This section explores empirical factors affecting sustainability of agricultural projects on poverty alleviation. South African government is promoting and advocating the participation of women in all spheres of government including of agriculture. Argawal (1994 & 1997) argued that women ownership of land leads to improvements in women's welfare, productivity, equality and empowerment. However, Bembridge (1984) found that the best farmer head of households were men who were managing the farm. This was reaffirmed by Dlova et al (2004), who found that males are physically capable of coping with manual demands of farming practices. Education plays a major role in the agricultural industry wherein competition is high between the previously disadvantaged and previously advantaged farmers in the commercial markets. The high level of education amongst the farmers may assist them to understand and interpret market information correctly; have ability to network and communicate their business ideas; to have better general farm management principles and marketing skills; and develop financial intelligence.

Literature has reveal that the success of farmer is affected by size and quality of the land owned and however categorizing farms by size is a debated issue. The correlation between farming and enterprise experience suggests that the more experience the farmer has in farming, the more he/she is likely to adapt to different farming enterprises. Based on the argument that farming experience is a predictor of good farming performance, enterprise experience can also play an important role in smallholder farming. This can be supplemented by the household size because the larger the

household size, the more likely the farmer is to become successful as household has more labor to work on the farm.

5.2.2 Research Methodology

The study was carried out in five Districts from Gauteng Province, South Africa. These are City of Tshwane (20 farmers), West Rand Districts (60 farmers), Ekurhuleni District Municipality (25 farmers), Sedibeng (15 farmers) and City of Johannesburg (40 farmers). The sample was drawn from these emerging farmers and random sampling technique was employed. As a result 160 farmers involved in crop production were selected randomly. Interviews were conducted at farmers' operational areas in the farm and to avoid bias, sampling was done to farms were production is in progress. A sample of one hundred and sixty (160) respondents was randomly selected from the list of farmers provided by Agricultural Advisors and database from GDARD AIS. A questionnaire was designed as a tool for primary data collection. The questionnaire was then administered to respondents (farmers) through face-to-face interviews.

To analyze data, frequencies, percentage and linear regression model was used to identify factors affecting sustainability of agricultural projects. Linear regression has been chosen because the dependent variable is continuous; linear models such as ordinary least squares (OLS) were used to show the effects of independent variables on the dependent variable. The variables used in the study were defined and included age, gender, educational level, farming experience, farm size, household size, household head, number of dependents, farm income, labor practices, land tenure system, land acquisition method and source of water.

5.2.3 Descriptive results

The results show that 40% (the majority) of the sampled farmers in Gauteng Province, South Africa were between the ages of 50-59 years while 18% of these farmers never attended school. The results of the study revealed that 65.6% of farmers had a household size range between 4-6 people and the generated farm income was less than R 200 000.This confirms the assumption that large household size spend more on their families and as a result, may commit less to purchase inputs, and this affects farm income negatively. Majority of farmers (42.5%) indicated that they were leasing the state land with 43.8% utilising less than 10 hectares of land from the government of Republic of South Africa.

Sustainability of agricultural projects is affected by the fact that 55.6% of farmers indicated that they do not have contractual agreements, 93.1% are incurring high transaction costs and 89.4% do

not have adequate agricultural infrastructure to maintain the quality of their produce. The study further revealed that 89.4% farmers are too confident about their projects because they provide food to their families and this affirmed by 50.6 % who indicated that they are able to employ workers and pay monthly wages.

5.2.4 Linear regression results

The results of linear regression model revealed that sustainability of agricultural projects is affected by farmers' socio economic characteristics. The independent variables were able to explain 82.5% of variation in the sustainability of projects. The statistically significant variables, at the 5% level are attitude, farmer participation, educational level, farm experience, farm income and land tenure system and land acquisition method. However, attitude, farming experience, land tenure system and acquisition method were inversely related to sustainability of projects indicating that a decrease in this variables will lead to increase of sustainability of agric project. A unit change in farmers' participation will lead to 11.2% increase of sustainability of agric projects similarly a unit change in educational level and income will lead to 13.9% and 20.3% respectively change in sustainability of agric projects.

The multiple regression analysis between farmers' attitudes and socio economic characteristics has shown that there is a strong correlation between independent variables and farmers attitudes towards agricultural projects. The independent variables were able to explain 85.8% of variation in farmers' attitude towards agric projects. The statistically significant variables, at the 5% level are effective, impact, farmer participation, age, educational level and farm income. Effective, impact, age, educational level and farming income were inversely related to farmers' attitude towards agric projects indicating that a decrease in these variables will lead to increase of farmers' attitude towards agric project. A unit change in farmers' participation will lead to 9.5% increase in farmers' attitude towards agric projects.

The multiple regression analysis between impact of agricultural project on farmers' livelihoods and socio economic characteristics has revealed that independent variables were able to explain 77% of variation in impact of agricultural project on farmers' livelihoods. Statistically significant variables, at the 5% level are effective, labor practice, attitude and land acquisition method. Attitude and acquisition method were inversely related to impact of agricultural project on farmers' livelihoods indicating that a decrease in this variables will lead to increase on impact of agricultural project on farmers' livelihoods. A unit change in effectiveness of agricultural program will lead to 26.4% increase on impact of agricultural project on farmers' livelihoods similarly a unit change in labor

practices method will lead to 15.8% respective change in impact of agricultural project on farmers' livelihoods.

Multiple regression analysis between farmers' participation on agricultural programs and socioeconomic characteristics of farmers indicates that independent variables were able to explain 22% of variation in farmers' participation on agricultural programs. The statistically significant variables, at the 5% level are effectiveness of agricultural programs and attitude. A unit change in effectiveness of agricultural programs will lead to 56.6% increase of farmers' participation on agricultural programs. Attitude was inversely related to farmers' participation on agricultural programs indicating that a decrease in this variable will lead to increase on farmers' participation on agricultural programs.

Results of multiple regression analysis between effectiveness of agricultural programs and socioeconomic characteristics of farmers have shown that independent variables were able to explain 63.9% of variation in effectiveness of agricultural programs. Statistically significant variables, at the 5% level are farm size, household head, labor practices attitude, impact, farmer participation and land acquisition method. Attitude, labor practices, and household head were inversely related to effectiveness of agricultural programs indicating that a decrease in these variables will lead to increase of effectiveness of agricultural programs. A unit change in farmers' participation will lead to 26.2% increase of effectiveness of agricultural programs similarly a unit change in land acquisition method and farm size lead to 13% and 13.5% change in effectiveness of agricultural programs.

5.3 CONCLUSION

The descriptive analysis of the study indicate that the majority of farmers are old and range between age of 50-59 years and those less than 39 years recorded 10% of the surveyed farmers. This means that as the age increases, the farm income is likely to decrease because older farmers are unable to adapt rapidly to agricultural technology compared to young farmers and this has a negative impact on the sustainability of agricultural projects. Furthermore the results obtained from the sampled farmers show that 43.8% are utilizing less than 10 hectares of land, 18.8% recorded that they don't have formal education, 70% have less than 5 years farming experience and 50% are generating farm income of less than R 2 000.00 per annum. However, it is clear that extension support can play a vital role in ensuring that these projects are profitable and sustainable.

It is therefore concluded that smallholder and emerging farmers should be involved in project planning, business plan be compiled with their participation and on-going mentorship on project planning implementation is crucial.

5.4 RECOMMENDATIONS

Sustainability of agricultural projects on poverty alleviation has been revealed by the empirical results and recommendations can be suggested. This section gives a series of options that can be considered in Gauteng Province, South Africa, in an effort to assist smallholder and emerging farmers to reach their full potential.

5.4.1 Establishment of skilled smallholder and emerging farmers

Sustainability of agricultural projects demand and call for knowledge and skills to manage and run any farming business while farming has evolved to be more technologically advanced and emphasizes need to be placed on how agricultural education and development skills can be achieved.

5.4.2 Access to land

The Land Reform is one of the complex issues that is not only economical but is also political in the sense that the imbalances of the past need to be redressed. The current challenges of land reform relate to land size allocated and the pace of land reform process. Farm sizes and access to land in general play an important role in farm income; and successful participation of emerging farmers in commercial agricultural markets. The majority of farmers in the study area lacked title deeds to the land where they carry out their farming activities. Although the variable does not directly affect market access, security of tenure is one of the most crucial factors determining farm development. The fact that the majority of farmers indicated that they carry out farming activities on state land is of concern. While there are indications that the issuing of title deeds is underway, most farmers are skeptical. This state of affairs is something which policy makers must prioritize when addressing problems affecting smallholder farmers. There is a need to develop a collective pre-transference and post transference strategy that will ensure that the elements of the Strategic Plan, programmes and resources are matched to create successful and sustainable emerging farm sector.

5.4.4 Promote contract farming

Contract farming is important to both the farmers and the contractors because it ensures a market for produce and supplies to the contractors. Once they get contractual agreements, an

entrepreneurial culture can be developed, where farmers produce for marketing, rather than trying to market what they have produced.

6. Areas for further research

Most of farmers in this study do not have title deeds and are practicing agriculture in a small size of land and there is a need for the research to investigate whether the land ownership will results in sustainability of agricultural projects.

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APPENDIX

QUESTIONNAIRE

FACTORS AFFECTING SUSTAINABILITY OF AGRICULTURAL PROJECTS FOR POVERTY ALLEVIATION IN GAUTENG PROVINCE OF SOUTH AFRICA

Date of interview.....

Name of project.....

Personal characteristics of the respondents

Age	< 39		40-59		50-59		60-69		< 70	
Gender	Male			Female						
Highest level of education attained	None	Primary School		Middle School		Secondary School		Tertiary		
Farming experience										
Farm size										
Household size										

Household head	Male Head		Female Head		Child Head	
Number of dependents						
Actual income from farming	< 100 000		101 000-200 000		201 000-300 000		401000 -500 000		>500 000	
What present your Labor practices in your project?	Family labor		Immediate family		Contract Worker		Permanent Worker	
Land Tenure System	Lease/ Rent		Private Owner		State land		Communal land	
How have you acquired land	Bought		Inherited		Resettlement		State land	
Source of water	Borehole Water		Municipal Water			

Farmers' attitude towards agricultural projects on poverty alleviation

Name of factor	Variable	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Technical-Technological	Low level of technical knowledge					
	Low access to information and modern technology					

Challenge	Inability to take advantage of modern technologies					
	Low productivity per hectare					
	Low level of mechanization					
	Inability to process agricultural products					
Managerial challenges	Lack of attention paid to waste management in different phases of production					
	No attention to planning on farmers' side					
	Lack of attention paid to environmental issues					
	Low quality of products compared to other farming systems					
	Low awareness level about managerial skills					
	Poor labor productivity					
Marketing Infrastructural Challenges	Difficulties in product storage due to lack of equipment and infrastructure					
	Low access to market					
	Difficulties with marketing					
	Large amount of waste in post harvest phase					
	Difficulties in transportation					
Access to finance	Collateral					
	High interest rate					
	Few affordable loans programs for resource poor farmers					
	Restricted access to credit					
	Inability to repay loans					

Sustainable Market	Customers prefer to buy at place where produce is available throughout the year					
	Customers buy from companies that that offer range of various produce					
	Proper packaging is the key factor that influence their purchasing decision					
	Environment consciousness is a factor which customer consider in buying produce					

Impact of agricultural projects on farmers' livelihood

Name of factor	Variable	Yes	No
Sustainable Employment	Does the project have an ability to employ workers?		
	Does the project have ability to retain workers?		
	Does the project have ability to pay wages on monthly basis?		
	Does the project have sustainable employment?		
	Does the project have an ability to provide pension fund?		
Income generation	Does the project generate sustainable income?		
	Does a project have ability to pay workers on monthly basis?		

	Does the project generate a profit?		
	Does the project provide workers with an attractive salaries/wages?		
	Does the income of the project be able to pay pension fund for workers?		
Food Security	Does the project provide food to you?		
	Does the project provide sustainable production?		
	Is the project able to ensure that food is available to you at all time?		
	Is the project productive throughout the year?		
	Does the project able to meet your dietary requirement per day?		
Training and skill transfer	Did you get training before the implementation of the project?		
	Was the training relevant to your project?		
	Was the training conducted both theoretically and practically?		
	Has training improved your project?		
	Has the training augmented your skills?		

Factors affecting sustainability of poverty alleviation projects

Name of factor	Variable	Yes	No
Production inputs supply	Do you have contractual agreement for production plan with registered agricultural inputs suppliers' e.g seeds, fertilizer companies etc for planting season in terms of orders?		
	Does the company that sells you inputs, supplies agreed quantities during the planting season?		
	Does your project experience high costs associated with production inputs?		
Climate change	Does the project have mitigation plans for natural disaster e.g floods, climatic conditions among others?		
	Do you receive early warning information about climate change for advance preparation?		
Access to market	Does your project have pre-harvest forward contract?		
	Does your project meet the demand of your targeted market?		
Market information	Do you have access to market information about commodity prices?		
Adequate infrastructure	Does your project have adequate infrastructure to produce to its optimal?		
Capacity building	Have you been capacitated with aspects of agriculture to respond to market demand?		

Mode of transport	Do you have refrigerated vehicle to transport your produce?		
Economic factors	Does your project cope with the costs of adapting to new technologies and innovations?		
	Uncertainty about the profit		
	Loss of productivity		
	Labor demands		
Access to credits	Do you have access to credits?		
Delay in supply of agric inputs	Does the company that supply you with agricultural inputs deliver in time?		
	Does your project make order of agricultural inputs in advance?		
Delay in payments of service rendered	Does the institution you supply with agric products pay you on time?		
Access to government support programs	Are you aware of the government programs that assist the farmers?		

Indicate which agricultural programs you participate and their effectiveness

Agricultural Program	Participation in program	Effectiveness of the programme

	Yes	No	Very Effective	Effective	Not Effective
MAFISA					
AGRIBEE					
LRAD					
Agricultural Disaster Management					
CASP					
Agro-processing					