

**Factors contributing to the transformation of smallholder farming to commercial farming in Mutale Local Municipality of Limpopo Province, South Africa**

**By**

**Nekhavhambe Elekanyani**

**(11612103)**

**A dissertation submitted in fulfilment of the requirements of the degree of Masters of Science in Agriculture (Agricultural Economics)**

**School of Agriculture**

**University of Venda**

**Thohoyandou, Limpopo**

**South Africa**

**Supervisor : Prof P.K Chauke**

**Co-supervisor : Dr. E.N Raidimi**

**April 2017**

## DECLARATION

I, **Nekhavambe Elekanyani** (11612103), hereby declare that the dissertation for Master of Science in Agriculture (Agricultural Economics) at the University of Venda hereby submitted by me, has not been submitted previously for a degree at this or any other institution, that it is my own work in design and in execution, and that all reference material contained therein have been duly acknowledged.

Researcher:.....

Date .....

(Mr E. Nekhavahambe)

Supervisor.....

Date.....

(Prof P.K Chauke)

Co-supervisor.....

Date.....

(Dr. E.N Raidimi)

## ABSTRACT

The study was conducted in the Mutale Local Municipality, Vhembe District of South Africa on a proportionally randomly selected sample of 153 smallholder farmers after clustering them into agricultural zones and commodity groupings (vegetables under irrigation, dryland maize and citrus fruit farming). Data were collected through a structured qualitative and quantitative questionnaire that was administered face-to-face to respondents and captured into the SPSS Version 24 computer program. The same program was used to analyse data through cross tabulations and logistic regression modelling. In particular, the study focussed on the impact of socio-economic characteristics, challenges that farmers face and views of extension officers on transforming subsistence farmers towards commercialization. The most critical findings of the study were dominance of women, lower youth participation, poor training and educational achievements, non-membership to agricultural organizations, low income levels and dependence on social grants and lack of credit as factors that could impact on farmers' transformation process. Farmers' challenges that could impact on transformation were identified as lack of production inputs, water, access to market and supportive infrastructure such as mechanization. However, the views of extension officers regarding transformation centred mostly around insufficient land holdings, climate change and financial support. In contrast to farmers, extension officers viewed market access as a minor challenge. The study recommended for development of strategies that could increase youth participation in farming such as start-up credit, reduction of dependence on social grants by adopting strategies that could increase productivity and thus income, exposure to funding opportunities through training and increased involvement of institutions of higher learning into smallholder farming activities.

**Keywords:** Binary regression, Commercialization, Cross tabulation, Subsistence farming, Transformation

## ACKNOWLEDGEMENTS

I would like to express my deep and whole-hearted gratitude and indebtedness to my supervisor Prof P.K Chauke and co-supervisor Dr. E.N Raidimi for their guidance and support throughout the course of this work. Their critical and valuable comments and suggestions are worthy enough to be mentioned here. Without their support and endless understanding, this dissertation would not have had its present shape. Thus, they deserve special thanks.

I gratefully acknowledge the Department of Agricultural Extension Services in Mutale Local Municipality of Limpopo Province under Vhembe District Municipality for all the help that I got from them, with special thanks to Mr A.T Magadani, Mr A.D Nengovhela and Mr M.A Mutswari, the extension officers in the Mutale Local Municipality where the study was conducted. I also thank all the farmers in the Mutale Local Municipality and Extension officers. Without them this project would not have been successful.

The understanding, support and encouragement that I have received from my family was a driving force throughout my studies. Dad, you have always been the pillar of my strength and for that I will always love you.

I wish to thank all my friends at the University of Venda for their constant support and encouragement. I would like to mention in particular Mashudu and Unarine who were there in every moment of my study. Debora, Khumbudzo and Stella, the competition and motivation you gave me was worth it.

I also want to thank the National Research Funding (NRF), the National Agricultural Marketing Council and the Land Bank institutions for their financial support. Their funds made my studies easier. Lastly but importantly, I would like to thank God for all the guidance and protection, for with Him all things are possible.

## DEDICATION

I dedicate this dissertation to my family and many friends. A special word of gratitude goes to my loving parents, Robson Mphatheleni and Mashudu Esther Nekhavhambe whose words of encouragement and push for tenacity keep ringing in my ears. My brothers Shalton, Thompho and Mufunwa were always there at all hours for me.

## TABLE OF CONTENTS

DECLARATION .....	i
ABSTRACT.....	ii
ACKNOWLEDGEMENTS .....	iii
DEDICATION.....	iv
LIST OF FIGURES .....	ix
LIST OF ABBREVIATIONS AND ACRONYMS .....	x
CHAPTER 1.....	1
INTRODUCTION .....	1
1.1 Background.....	1
1.2 Problem statement .....	3
1.3 Objectives, research questions and hypotheses of the study .....	4
1.3.1 Main objectives.....	4
1.3.2 Specific objectives .....	4
1.3.2.1 To assess the socio-economic characteristics that would assist subsistence farmers to transform from subsistence to commercial farming in Mutale Local Municipality. ....	5
1.3.2.2 To evaluate the challenges faced by subsistence farmers in the transformation processes.....	5
1.3.2.3 To discern the views of extension officers regarding issues that hamper subsistence farmers from the transformation processes.....	5
1.3.3 Research questions.....	5
1.3.3.1 What are the socio-economic characteristics that would assist subsistence farmers to transform from subsistence to commercial farming in Mutale Local Municipality?.....	5
1.3.3.2 What are the challenges faced by subsistence farmers in the transformation processes in Mutale Local Municipality?.....	5
1.3.3.3 What are the views of extension officers regarding the issues that hamper subsistence farmers from transformation? .....	5
1.3.4 Research hypothesis .....	5
1.4 Justification for the study.....	5
1.5 Study limitations .....	6
1.6. Explanations of key terms of this study.....	6
1.6.1 Transformation of agriculture .....	6
1.6.3. Subsistence farming .....	7
1.6.3 Smallholder commercialisation and commercial farming.....	7
1.6.4 Market access .....	8
1.7 Outline of the chapters .....	8

CHAPTER 2.....	10
LITERATURE REVIEW.....	10
2.1 Introduction .....	10
2.2 Socio-economic characteristics that influence transformation from subsistence to commercial farming .....	10
2.2.1 Socio-economic factors that could influence smallholder commercialization .....	10
2.2.1.1 Gender and age of farmers .....	10
2.2.1.2 Level of education achieved by farmers .....	12
2.2.1.3 Training received by farmers .....	13
2.2.1.4 Membership to agricultural organizations .....	14
2.2.1.5 Household income.....	14
2.2.1.6 Access to credit, market and farm inputs.....	15
2.2.1.7 Land tenure and Land size .....	17
2.3 Overview of challenges faced by smallholder farmers .....	19
2.4 The role of extension officers in smallholder commercialization .....	20
2.5 Policies for transformation of smallholder agriculture in South Africa.....	21
2.6 Chapter summary.....	24
CHAPTER 3.....	25
METHODOLOGY.....	25
3.1 Introduction .....	25
3.2 Study area.....	25
3.3 Research Design.....	26
3.4 Population and sampling .....	26
3.5 Data collection method.....	29
3.5.1 Formal household survey.....	29
3.6 Data analysis .....	29
3.6.1 Socio-economic characteristics of households.....	29
3.6.2 Assessing challenges faced by smallholder farmers to transform from subsistence to commercial farming .....	30
3.6.3 The views of extension officers regarding issues that hamper subsistence farmers from the transformation processes .....	30
3.6.4 Inferential statistic (Model specification).....	31
3.7 Expected outcomes of the study .....	33
3.8 Ethical considerations .....	34
CHAPTER 4.....	35
RESULTS AND DISCUSSION.....	35
4.1 Introduction .....	35

4.2	Descriptive Results of Survey Data .....	35
4.2.1	Socio-economic characteristics of farmers that would assist them to transform from smallholder to commercial farming .....	35
4.2.1.1	Gender, age and educational level of attainment by respondents.....	35
4.2.1.2	Household income and sources.....	37
4.2.1.3	Land size and tenure systems .....	39
4.2.1.4	Marketing information .....	40
4.2.1.5	Other socio-economic factors that could assist subsistence farmers in the transformation processes .....	43
4.3	Challenges faced by farmers in Mutale Local Municipality.....	45
4.4	Views of extension officers regarding the factors that hamper subsistence farming from transformation.....	46
4.5	Inferential statistical analysis .....	48
4.5.1	Socio-economic characteristics that affect farmers to access the market.....	48
4.5.1.1	Correlation analysis.....	48
4.5.1.2	Binary logistic regressions analysis .....	49
4.6	Discussion of results .....	53
4.6.1	Descriptive analysis .....	53
4.6.2	Inferential analysis.....	59
4.7	Chapter summary.....	60
4.6.1	Descriptive analysis .....	60
4.6.2	Inferential results .....	61
	CHAPTER 5.....	62
	SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	62
5.1	Introduction .....	62
5.2	Summary.....	62
5.2.1	Descriptive analysis .....	62
5.2.2	Inferential analysis .....	64
5.3	Conclusion .....	64
5.4	Recommendations .....	66
5.5	Suggestions for future research .....	67
6	REFERENCES .....	69
7	APPENDICES.....	86

## LIST OF TABLES

Table 3.1: Reflections of the population and ultimate samples per ward in the three farming systems in the four ward services in Mutale Local Municipality .....	28
Table 3.2: Specification of explanatory variables for Binary logistic regression .....	33
Table 4.1: Gender, age and educational level of farmers from the three farming systems in Mutale local Municipality .....	36
Table 4.2: Famers household monthly income and their main sources per farming system	38
Table 4.3: Tenure system and land size per farming system in the Mutale Local Municipality .....	40
Table 4.4: Market access and main target market within the three farming systems adopted by farmers of Mutale Local Municipality .....	41
Table 4.5: Farm produce per market participation in Mutale Local Municipality .....	42
Table 4.6: Access to other socio- economic factors by farmers in Mutale Local Municipality	43
Table 4.7: Infrastructure support received by Mutale Local Municipality farmers .....	44
Table 4.8: Major challenges faced by farmers in the Mutale Local Municipality .....	45
Table 4.9: Views of extension officers regarding challenges that hamper farmers from commercialization in the Mutale Local Municipality .....	47
Table 4.10: Correlation Matrix .....	49
Table 4.11: Parameter estimator of the binary logistic regression model (with market access as dependent variable) .....	50
Table 4.12: Observed versus predicted probabilities for access to markets.....	51

## LIST OF FIGURES

Figure 3.1: Map of Vhembe District showing Mutale Local Municipality ..... 25

## LIST OF ABBREVIATIONS AND ACRONYMS

AgriBEE: Agricultural Broad-Based Black Economic Empowerment

BATAT: Broadening Access to Agriculture Thrust

CASP: Comprehensive Agricultural Support Programme

DAFF: The Department of Agriculture, Forestry and Fisheries

FAO: Food and Agriculture Organization of the United Nations

GAP: Good Agricultural Practices

GIS: Geographic Information System

IDC: Industrial Development Corporation

LRP: Land Reform Programme

LRAD: Land Redistribution for Agricultural Development

MAFISA: Micro Agricultural Financial Institution of South Africa

MLM: Mutale Local Municipality

NAMC: National Agricultural Marketing Council

SEDA: Small Enterprise Development Agency

SIP 11: The Strategic Integrated Project (SIP) 11

SPSS: The Statistical Package for Social Scientists

SMMEs: Small, Medium and Micro-sized Enterprises

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

Agricultural production mostly follows three processes, i.e. farming as a hobby, subsistence production and commercial farming (Nyikai, 2003; Perdomo, 2014). As highlighted by Wickramasinghe (2009) and Leahy and Goforth (2014), transformation of smallholder farming to commercialization is important in addressing poverty in a sustainable manner. The latter could require capital intensification, partnership and capacity building for the smallholder farmer to move towards commercialization. Tufa *et al.* (2014) have noted that many developing countries have tried to achieve commercialization by diverting production and exports away from the traditional commodities in order to accelerate economic growth, expand employment opportunities, and reduce rural poverty. Through the process of commercialization interventions and linkages between the farmers and critical stakeholders such as the government and the private sector, jobs and other economic opportunities could be expanded. Averbek and Mohamed (2006) noted the critical role of forward-looking developmental policies in motivating smallholder farmers to progress towards commercial farming.

Literature attests to the critical role that subsistence farming plays, especially in addressing the challenge of global food insecurity through effective agricultural commercialization (Kostov and Lingard, 2002; Brits, 2014). According to Lipton (2013), subsistence farming remains a barrier towards developing rural areas, and thus the need for transformation. As further highlighted by FAO (2014), there is a need to move towards addressing the growing food demand and to partake in income mediated benefits that would accrue from sale of surplus produce. However, commercialization of farming may need public sector institutions to play a leading role in the transformation process (Zhou *et al.*, 2013). It was also emphasised by Kirui and Njiraini (2013) that modernization and commercialization need a considerable focus among policy makers and development specialists not only at the level of farming household but also at the level of national

and international policies. The Department of Agriculture, Forestry and Fisheries in South Africa is well placed to supporting smallholder farmers towards commercialization, especially because of its overseeing and active role within the agricultural sector (Kgosiemang and Oladele, 2012). Such an action could be vital for the country's black people who have been marginalised in poorly resourced rural areas that contributed significantly to their underdeveloped farming practices. Since the promulgation of the Land Reform Programme, 43% of land in South Africa has been transferred to blacks, mostly through the Land Redistribution for Agricultural Development (LRAD) and Restitution Programmes (Raleting and Obi, 2015). However, the focus of this study is the smallholder farming sector that has not or minimally benefited from some aspects of the land reform programme such as Illima/Tema intervention. As articulated in the literature review section, a number of policies targeting the smallholder farming sector are in place but literature is generally abound with limited growth within the sector, that requires an investigation of the role of socio-economic factors in the transformation process.

Through the Broadening Access to Agriculture Thrust (BATAT), an initiative that supports farmers in terms of their financial needs, human resources development, technology development, delivery systems and marketing services, the government has moved a step further towards agricultural transformation (Kgosiemang and Oladele, 2012). As further highlighted by DAFF (2014) South Africa is moving towards the commercialisation of smallholder agriculture. In addition, government is playing a critical role in broadening smallholder market participation by forging a better linkage between corporate business and SMMEs across the value chain, which (in particular, AgriBEE) has been used as an instrument by the government to support smallholder agriculture, more especially in rural areas. Sikwela and Mushunje (2013) further argued that, as a result of this, commercial and developments banks, non-governmental organisations and private institutions came up with policies aimed at improving access to markets through provision of finance as well as technical and management skills. As a result, DAFF is in the process of trying to specifically address inadequate support to smallholder farmers.

## 1.2 Problem statement

South Africa emerged from an era in which agricultural production was divided into two clearly discernible systems, i.e. subsistence farming for black people and commercial farming mostly for whites (Black *et al.*, 2014). While the former was mostly meant for household consumption, the latter was more oriented towards providing for the local and international markets. The new government that assumed power in 1994 has initiated several strategies aimed at assisting the smallholder, largely black farming sector, to shift towards commercial farming, with minimal success. According to the NAMC (2015), approximately R381 million has been invested in smallholder farming following reprioritisation of the Comprehensive Agricultural Support Programme and Ilima/ Letsema funds to support farmers. Smallholder farmers in South Africa benefited in the Comprehensive Agricultural Support Programme by farming inputs, equipment and improved irrigations farming. Sikwela and Mushunje (2013) further argued that there are several support schemes to support small and emerging farmers which include IDC, SEDA, and established producers' associations, along with Non-Government organisations (NGOs). There are other organisations such as Farm Africa, Oxfarm and service providers such as MAFISA, Ilima-Letsema and Comprehensive Agricultural Support Programme and other in operation in South Africa.

Several studies have been conducted on the topic of commercialisation of smallholder farmers with the aim of broadening the knowledge on the challenges that limit such migration from subsistence to commercial farming. However, subsistence agriculture is still dominant in most rural areas in South Africa. Similarly, there are several households in Mutale area who are engaged in subsistence farming without any clear indication of transformation, despite the efforts by the government and the municipality to transform them. This study considered this to be a gap that requires further exploration, especially in responding to this overarching question: "What are the factors that could assist them in transforming from subsistence to commercial farming?" A follow-up question that also needs an in-depth investigation is; "What are the views of extension officers regarding hampering factors to smallholder commercialization?"

Although transformation of agriculture is a long run process from subsistence to emerging stage to fully commercial mode, this study is critical to uncover the socio-economic factors that would assist farmers to transform from subsistence into commercial farming from especially the smallholder sector that needs not to be differentiated from the subsistence sector as suggested by Cousins (2010). The findings of this study will not only be beneficial to the transformation of smallholder farmers, but to the whole sector's policy makers, other researchers and implementing agencies. Due to their continuous interactions with smallholder farmers, and thus being placed at a vantage point in terms of observing the transformation process first-hand, their views become critical. A study by Aliber and Hart (2009) highlighted the observation from South African researchers regarding the contribution of smallholder farming to household food security, despite the prevalent complexities and the low input nature of the sector. Therefore, this study is in support of the above argument that transformation of smallholder farming will also be a tool for poverty alleviation and food security in the Mutale Local Municipality and South Africa as a whole. As stated in the objectives below, the study seeks to unearth the contribution of socio-economic factors to the transformation of smallholder farmers (using market access as a proxy), in addition to evaluating challenges faced by the sector and views of those that interact with them on a continuous basis (extension officers).

### **1.3 Objectives, research questions and hypotheses of the study**

#### **1.3.1 Main objectives**

The main objective of this study is to assess the factors that would transform subsistence to commercial farmers in Mutale Local Municipality.

#### **1.3.2 Specific objectives**

The study seeks to achieve these specific objectives:

1.3.2.1 To assess the socio-economic characteristics that would assist subsistence farmers to transform from subsistence to commercial farming in Mutale Local Municipality.

1.3.2.2 To evaluate the challenges faced by subsistence farmers in the transformation processes.

1.3.2.3 To discern the views of extension officers regarding issues that hamper subsistence farmers from the transformation processes.

### **1.3.3 Research questions**

These questions have been generated in a quest to help attain the objectives outlined above:

1.3.3.1 What are the socio-economic characteristics that would assist subsistence farmer to transform from subsistence to commercial farming in Mutale Local Municipality?

1.3.3.2 What are the challenges faced by subsistence farmers in the transformation processes in Mutale Local Municipality?

1.3.3.3 What are the views of extension officers regarding the issues that hamper subsistence farmers from transformation?

### **1.3.4 Research hypothesis**

Socio-economic characteristics such as gender, age, educational level, household income, access to credit and access to training do not assist subsistence farmers to transform from subsistence to commercial farming in Mutale Local Municipality

### **1.4 Justification for the study**

There is a growing recognition within agricultural research and development to transform smallholder farmers out of their traditional way of farming towards more innovative farming that could result in better income generation (Njukia *et al.*, 2011). This study is in support of the above argument and it will enrich the stock of existing but limited knowledge and literature whose focal point is commercialization of smallholder farmers in Limpopo Province and thus can serve

as a reference point for policy makers, academics, researchers, extension workers and farmers. Most importantly, this study can give better insight into the role of commercialization in enhancing the welfare situation, reducing poverty and ensuring food security of subsistence farmers.

## **1.5 Study limitations**

As far as research is concerned, it is probable that there will always be certain limitations. This study has also encountered certain difficulties in the course of collecting data from the study area. The first challenge was the difficulty of getting the randomly selected respondents on schedule in the course of collecting primary data from the farmers.

Due to time constraints, the geographical scope of this study was limited to Mutale Local Municipality as the primary target of the research, and especially Tshixwadza, Masisi, Tshishivhe and Tshipise ward services. Possible dissolution of Mutale Local Municipality was also regarded as a limiting factor in the study area. The dissolution would have discouraged farmers and extension officers who were participating in this study from providing useful information or participating in the study.

## **1.6. Explanations of key terms of this study**

### **1.6.1 Transformation of agriculture**

Transformation of agriculture is the process by which agricultural production is shifted from subsistence production to market-oriented production. Transformation entails changes from non-monetary system of access and use of resources to market exchange (Sokoni, 2008). According to Obiora (2014), agriculture should not just become a development programme but also an income generating commercial activity. In the transformation of agriculture, farmers focus their production primarily towards the market. According to Osmani and Hossain (2015), lack of full participation in markets by smallholder farmers prevents them from transiting into commercial

farming. Therefore, this study defined the transformation of agriculture as the shift from subsistence farming to market oriented farming, thus the smallholder commercialisation.

### **1.6.3. Subsistence farming**

Averbeke (2008) and Kong *et al.* (2014) define subsistence farming as the production of sufficient food and fibre for the utility of the farm family. It is farming that is practised by households to supplement their consumption and sell the little surplus that remains or none due to limited resources and technological limitations. According to Masters *et al.* (2013), subsistence farming is characterised by low use of inputs and low scale of farm outputs. It involves households that are low-income earners and net buyers. Davidova *et al.* (2009) have highlighted that subsistence farming is more preferred by households with non-farm income and who are no longer economically active in other sectors.

Cousins (2010) has however noted that differentiating small and subsistence farming could be counterproductive to the South African agrarian reform in that they all emanate from the same pool of a large number of mostly needy rural dwellers that aspire to enter into the productive agricultural economy. Therefore, this study used the terms interchangeably without differentiation in line with the two sources cited above. As will be observed in the result chapter of this study, some farmers did access markets, and thus income (used as a proxy for commercialization in this study), while others completely failed to do so. It is therefore appropriate for this study to adopt the view of Cousins (2010) in viewing the two as conceptually synonymous, although smallholders will be more associated with minimal market surpluses as against non-market participation for the other as depicted below.

### **1.6.3 Smallholder commercialisation and commercial farming**

Jaleta *et al.* (2009) defined smallholder commercialisation as the strength of the linkage between farm household and markets at a given point in time. They further argue that smallholder commercialisation is part of an agricultural transformation process in which individual farms shift

from subsistence-oriented production towards more specialised production targeting markets. Zhou *et al.* (2013) also argued that commercialisation of agriculture has to do with the shift from subsistence farming towards market orientation. Poulton *et al.* (2008) further highlighted that smallholder commercialisation is agricultural practice with a focus on the market. Smalley (2013) indicates that commercial farming is associated with the degree of reliance on markets for farm inputs and outputs, a substantial proportion and an underlying motivation to seek profit. Despite access to market, Olubode-Awosola and Van Schankwyk (2006) noted that commercial farming engages households who have high management aptitudes, financial stability, high turnover and economic viability, good socio-economic standing and capacity intensive agricultural production. According to Gebre-Ab (2006), commercial farming also has to do with the increase in the ratio of marketed output. It also involves the use of high inputs and a variety of products.

#### **1.6.4 Market access**

Market access is an important element of smallholder commercialisation which acts as a mechanism for exchange. It is vital for farmers to be able to access markets (Jari and Frazer, 2014). Market access in the context of smallholder can be defined as the ability to seize available market opportunities, that is to be able to access a particular point from where to sell the farm produce (Ngqangweni *et al.*, 2016). This study regards market access as the key element of transforming smallholder farmers from subsistence farming to commercial farming in the Mutale Local Municipality. Therefore, market participation by farmers was recognised as the key transformation indicator from subsistence to commercial farming.

#### **1.7 Outline of the chapters**

This dissertation is composed of five (5) chapters. Chapter 1 covers the introduction part of the study which includes the background of the study, the formulation of the problem statement, designing of research objectives, research questions and the hypothesis of the study, together with the justification for the study and study limitations. Chapter 2 contains the literature review of previous studies or research related to this study. Chapter 3 outlines the research methodology,

including the techniques for collecting and analysing data. Chapter 4 comprises of the results and the discussion of the collected data after which chapter 5 presents the summary, conclusion and the recommendations of the study.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter features a review of the literature related to the study. It mainly focuses on the review of the factors that would transform smallholder farmers to commercial farmers, both social and economic factors, that is, socio-economic characteristics that could influence the transformation of smallholder to commercial farming, challenges faced by smallholder farmers in the transformation processes and the role of agricultural extension officers in smallholder commercialization.

#### 2.2 Socio-economic characteristics that influence transformation from subsistence to commercial farming

The socio-economic characteristics that could influence transformation of subsistence to commercial farming reviewed in this study included gender, age, level of education, training received by farmers and the membership of farmers to agricultural organizations, households income, access to credit, access to market and inputs, land tenure and size.

##### 2.2.1 Socio-economic factors that could influence smallholder commercialization

###### 2.2.1.1 Gender and age of farmers

Liverpool-Tasie *et al.* (2011), highlight that gender inequality in agricultural practices is a characteristic of many countries. Specifically, males have been found to be more successful farmers compared to their female counterparts. There was an assumption that male farmers focused more on profit maximization while female farmers mostly focused on the family welfare that resulted in low proportion of female farmers to attaining success in the agribusiness market. According to Njuki *et al.* (2011), men were more successful in market participation than women due to their competitiveness. The study also noted that women faced many constraints when they engaged in the marketing system. In another study by Mitiku and Bely (2014) in South Western Ethiopia, male farmers for example, usually have higher potential of crop production

efficiency advantage; access to market information and incomes than the female-headed households. This could explain the success of male farmers on transformation from smallholder to commercial farming. Another study conducted by Leykun and Jemma (2014) further explore that farmers' characteristics like being male decrease the probability of being smallholder farmer and have a positive effect on transformation to commercial farming. Another study conducted in South Africa (Moyo, 2013) argues and supports the fact that the probability of being female decreases the chances of being a commercial farmer and that many female farmers were practicing smallholder farming specific for home consumption.

A study by Diale (2011) in Limpopo Province – in contrasts to many other findings – uncovered the dominance of females to transform from smallholder to commercial farming. Women in that study constituted 80% of the gender dimension. Rathore and Fartyal (2013) have further contrasted the findings on the dominance of male farmers. In a study conducted in India, female farmers were dominant over their male counterparts in agribusiness area. Laven and Pyburn (2015) noted the role of government in many developing countries that has been promoting gender equality in most sectors that contribute to economic growth including agricultural sectors, that means that female farmers are now well or equally empowered to male farmers practicing farming as ventures. This creates better competition for both female and male farmers and stimulates welfare gain to both genders in the agribusiness sectors.

Martey *et al.* (2012) highlighted that age could also assist or impede farmers to transform from smallholder to commercial farming. Young famers are likely to commercialize compared to elder farmers since older farmers are challenged by lack of new technical skills and innovation which are the critical elements to transform farmers. Alam *et al.* (2009) highlighted that farmers at the age of 16 to 35 years were likely to commercialize their farming activities compared to the above 35 years age group. However, many farmers from youth group were part-time farmers while farmers from the other group (36 to 55 years) were fulltime. The work performance of this group and income potential are far behind than the group with an age range 16 to 35. The Youth age group was able to acquire more business techniques due to their higher level of education

attained. Leykun and Jemma (2014) have noted that an increase in age by one year significantly decreases the probability of being a smallholder farmer whereas it has a positive effect on being a transition farmer in Ethiopia.

### **2.2.1.2 Level of education achieved by farmers**

Level of education attained by farmers is vital for farmers' performance in several areas in agribusiness sectors. The level of education makes it easier for farmers to possess different skills and knowledge required for the success of commercialization. This could be achieved through attending seminars, workshops and conferences where farmers would have adequate access and gain innovation that could enhance their farming progression (Yamusa and Adefila, 2014). A study in Bangladesh revealed that highly educated farmers were likely to commercialize than less educated farmers. Productivity of the farmers managed by a higher educated group is higher than the farmers managed by a less educated group. It was also found that since educated groups are well advanced; they know better business techniques than their counterparts (Alam *et al.*, 2009).

In another study by Mulu-Mutuku *et al.* (2013) it was noted that education and training in Kenya is one of the critical factors to smallholder commercialization. Many are farmers trained by the ministry of agriculture through extension officers, some trained by university and college institutions. These institutions trained farmers on business management aspects including the field work which are the important activities to transform them into commercial orientation. The latter were improving their knowledge that could assist them to transform from smallholder to commercial farming. It is highlighted by Martey *et al.* (2012) that educational background is a crucial factor in smallholder commercialization. Another finding by Matsane and Oyekale (2014) in Mahikeng Local Municipality, North West Province, South Africa revealed that more than half of farmers were either primary educated or non-educated and this had negative impact to their transformation from smallholder to commercial farming. According to Botlhoko and Oladele

(2013), educated farmers are likely to adopt new innovation than illiterate farmers, hence, their productivity increases resulting in greater farms' returns.

A study done by Khapayi and Celliers (2016) in the Eastern Cape Province of South Africa revealed that the majority of farmers in rural areas were lowly educated which could result to inability to interpret market information necessary for production planning and marketing. Another study conducted by Diale (2011) supports other findings regarding education as a fundamental element to smallholder transformation in Limpopo Province of South Africa. A study attested that farmers who had attained higher grades in schooling were likely to improve their farming activities compared to those who have not attained any educational levels.

### **2.2.1.3 Training received by farmers**

A study conducted by Olaoye (2014) in the Sub-Saharan African Countries – Nigeria included – revealed that training of farmers, especially in the rural areas, on technological skills acquisition is vital for the transformation of smallholder farmers. Farmers require technological skills which includes computer usage, tractor, radio and televisions. These will according to Olaoye (2014), permit them to access information related to their farming activities. In a study by Alam *et al.* (2009) it was revealed that farmers were receiving training based on production of crops, storage, pest control and management. Technical colleges were responsible for provision of education and training to many farmers. The role of non-government organizations was also noted as a fundamental instrument to agricultural transformation in Bangladesh.

Another study conducted by Worku (2016) supported the provision of training to farmers as a critical tool to smallholder commercialization in Ethiopia. However, the lack of orientation to agricultural production practices by farmers was a major constraint to many farmers that limit them to improve their technical knowledge. A number of strategies were adopted by extension officers for training provision, i.e. training farmers individually or in a group meetings, demonstrations and farmers field days.

#### **2.2.1.4 Membership to agricultural organizations**

Agricultural organizations are critical elements to the success of smallholder commercialization amongst farmers themselves and results in high output commercialization (Aderemi *et al.*, 2014). In a study by Ojiagu *et al.* (2015) it was found that cooperatives form building units of farmers organizations that should not be undermined. It was found that agricultural organizations enhance the supply of inputs, processing, and credit access and extension services. Most of the farmers were able to transform from home consumption production to market orientated production. It was also found that cooperatives were also enhancing the economic stability of farmers, more especially income that farmers generate in their farming activities. Chirwa and Matita (2012) argue that the role of agricultural organizations in commercial initiatives and orientation of smallholder farmers towards the concept of farming as business and facilitating market access – are the motivating factors to smallholder commercialization. In another study conducted by Tolno *et al.* (2015) it was concluded that agricultural organizations have the potential to benefit farmers by increasing their incomes and that farmer organizations provide a good platform for the provision of farm production inputs and marketing of output; this can immensely enhance farm productivity and increase farm income thereby contributing to the reduction of poverty.

#### **2.2.1.5 Household income**

Income generated by farmers is one of the key economic aspects that impact smallholder commercialization (Akuduku and Dadzie, 2012). Poon and Weersink (2011) have attested that both farm income and off-farm income had significant impact to commercialization of agriculture in Canada. Drafor (2014) conducted a study in Ghana regarding smallholder commercialization that most farmers were motivated by the regular flow of income generated from agricultural activities. The increase in income was a major driving force to adopt venture opportunities in Ghana agricultural sectors.

According to Ogeto *et al.* (2013) farmers can either generate income from two sources which includes farm and off-farm income which is important in determining farmers' scale of production and the types of enterprise they undertake. In a study conducted by Adeniyi (2013) farmers' income increased proportional with the land size, ie. Farmers with high income either generated from farm or off-farm were able to expand their landholding for commercial farming and to maintain the standard of high income.

Hogos and Geta (2016) indicated that farmers in Ethiopia were able to generate increased income from their surplus production which could also assist them in farm capital. A study by Ogeto *at al.* (2013) further confirmed their findings on the study that approximately half (43.3%) of the farmers were earning income from both farm activities and off-farm activities. Njukia *et al.* (2011) contrasted the findings that only farmers with off-farm income are more likely to attain success in agribusiness sectors. There is positive expectation that households who are limited to off-farm income will tend to obtain higher income from agricultural practices by commercialising their production. This was shown in a study conducted in two African countries; Malawi and Uganda, where smallholders generated high levels of income through commercialization (Njukia *et al.*, 2011). Similarly, in South Africa some households were able to generate annual income that ranged between R10 000 and R50 000. The regular inflow of income from their farming activities assists them to expand their farming activities that resulted in progress in transformation processes (from smallholder to commercial farming) (Oni *et al.*, 2010). As attested by Lipton (2013), such income levels are much higher than experienced in countries such as Russia where the majority of farmers (87%) did not commercialise their farming ventures.

#### **2.2.1.6 Access to credit, market and farm inputs**

According to Chirwa and Matita (2012) smallholder commercialization requires high uptake of improved farm inputs, link to markets, quality control and information on markets and prices. The latter was also highlighted that it needs both government and non- government intervention to

enhance smallholder farmers' transformation. Muzari *et al.* (2012) conducted a study in Sub-Saharan Africa region that identified the need of development of infrastructures and institutions that have to work with farming inputs, market support services, credit funds and extension services that could stimulate agricultural transformation. In a study in Ethiopia it was found that the lack of access to market information, higher price of fertilizers, limited possession of draught power, shortage of household labour and distance to local markets were constraining factors towards transformation of smallholder agriculture and intensity of commercialization (Hailua *et al.*, 2015). Another study done by Khapayi and Celliers (2016) in the Eastern Cape of South Africa showed that, many farmers did not have access to market information. Such farmers were unlikely to participate in marketing because they were not well informed about what is happening in the markets.

In a study by Tolno *et al.* (2016) it was revealed that the use of improved seeds and fertilizers in Middle Guinea had significant impact to farmers' output and the quality. Most farmers participating in the agribusiness sectors were depending on the Genetic Modified Inputs which cannot be undermined as a crucial element to meet the needs of commercial world of farming. In another study conducted in Sri Lanka, genetically modified seeds were found to be a crucial element in the success of commercialization. Farmers who were able to adopt this technology were better placed to improve their farming practices. The success of commercialization depended on the distribution of quality seeds (Wickramasinghe, 2009). FAO (2014) emphasises that the increase of input variation in production in most of the commercial farmers in Kenya has adopted the use of inputs variation. Collier and Dercon (2014) state that large commercial farmers are likely to be closer to the frontiers of technology, finance and logistics. The adoption of such innovation made commercial farmers to be substantial advantageous over the smallholder farmers.

Credit funding is one of the determinants of commercialization that increase prospects of farmers to access resources and inputs that enable them to expand their farming activities and enter markets (Chirwa and Matita, 2012). A study conducted in Nigeria attested that sustainable

agricultural development in many developing countries requires access to marketing facilities, agro-processing technologies, and credit institutions. This could stimulate growth in agribusiness sectors (Ajani *et al.*, 2015). Mituku and Bely (2014) support access to credit by farmers as a critical element to smallholder commercialization. Credit helps to improve the ability of farmers to buy equipment and encourage farmers to adopt new technology. It also improves farmers' productivity and farm income.

In another study in Ghana it was reflected that a lack of credit is one of the major barriers to smallholder commercialization as the adoption of both labour and capital intensive depends of available funds for farmers. The latter requires special attention to enhance transformation of agriculture (Drafor, 2014). In a study done by Chisasa (2014) it was noted that access to credit by small-scale farmers in South Africa, remains a constraining factor to agricultural transformation. Chisasa (2014) further highlighted that fewer smallholder farmers demand credit from commercial banks than informal lenders because of high interest, and long and difficult application procedures.

#### **2.2.1.7 Land tenure and Land size**

In a study conducted by Sichoongwe *et al.* (2014) it was highlighted that the extent of crop diversification in Zambia was mostly affected by the available farming land. The need of government to implement the policies that enhance farmers to have access to land was the suggested strategy that could also contribute to smallholder commercialization. Another study in Ethiopia (Leykun and Jemma, 2014) explored the view that as land size cultivated increases by one unit, the probability to be smallholder farmer decreases, while the probability to be commercial increases. This shows that land size could assist the smallholder farmer to transform from smallholder to commercial farming. In another study by Forbord *et al.* (2014) it was suggested that different tenure systems could also contribute to smallholder farmers to access land sufficient for marketing. Land tenure included accessing the communal land acquisition, rental land or private land tenure system. Zhang and Donaldson (2010) have noted that farmers

in China do not own the land. Farmers acquire land through rent tenure system. Mingxuan *et al.* (2011) have further noted that growth in agribusiness sectors in China is affected by weaker ownership of land. The need to accelerate the land titling process and build up the capacities of relevant land administration agencies was suggested in order to facilitate the availability of land for farming that could increase the degree of commercialization.

Hailua *et al.* (2015) also noted that size of land is very important in determining farmer participation in output markets in Ethiopia. The more the farm holding size, the more farmers shift their farming activities from home consumption to a business entity. A study conducted by Chamberlin (2007) in Ghana shows that 90% of farm produce is from about 3.9 hectares (ha) of land. More than 50% of farmers have landholding of less than 3 hectares (ha), reflecting a low degree of progression to commercialization. In another study by Ogeto *et al.* (2013) in Kenya it was noted that access to land ownership stimulates growth in farming practices. This emphasises land tenure as a stimulating factor to smallholder commercialization.

The agricultural sector in South Africa is characterised by the dualism nature of production which includes both commercial and small-scale farming. Many rural farmers in South Africa depend on land as a source of production. However, a huge space land is completely degraded by human activities and has affected commercialization negatively (AgriSETA, 2010). Over 600 000 families in South Africa depend on the smallholder production and consumption of maize as a staple food. However, production is severely affected by limited land for farming (Ncube *et al.*, 2014). The latter impacted many farmers in South Africa who apply mixed farming practices which also limit crop intensification (Betek and Jumbam, 2015). Another study by Matsane and Oyekale (2014) in South Africa again revealed that farmers acquired their land through communal tenure. Communal land tenure is a predominant pattern of land ownership which does not ensure security, but personal land tenure ensures security and sustainable use of land which is essential to maximize farm investment and returns.

### 2.3 Overview of challenges faced by smallholder farmers

A study undertaken by Zhou *et al.* (2013) in Southern Africa identified several challenges to smallholder commercialization. The latter included climate change, lack of supportive structures, poor access to market and information, public services such as extension services and technology. These were some of the constraining factors to the transformation of smallholder to commercial farming by many farmers. Another study by Hailua *et al.* (2015) revealed unreliable rainfall, lack of farm inputs such as fertilizers, crop pests and diseases, distance to market and lack of irrigation infrastructures as major constraints that limit participation of smallholder farmers in crop commercialization in Ethiopia.

In a study conducted by Kadapatti and Bagalkoti (2014) several challenges that were faced by smallholder farmers included; water shortage and water management, lack of access to inputs, inadequate availability, lack of quality inputs, non-availability in affordable packages, lack of knowledge and lack of location specific and small farmer friendly technologies. Despite the challenge faced subsidies from government compensate the poorest farmers by inputs. Poor access to public goods was also mentioned as a constraining factor to smallholder commercialization in India. The latter includes irrigation infrastructures such as dams. Kadapatti and Bagalkoti (2014) further noted poor access to suitable extension services as restricting factors to suitable decisions regarding cultivation practices and technological application.

A study conducted by Njukwe *et al.* (2014) revealed the lack of market services support as one of the major challenges to farmers in Cameroon. Most roads linking farmers to the point of selling were not accessible and constitute a blockage for out-flow of perishable agricultural produce by most farmers in Cameroon; hence there was a lack of storage by many farmers. Another study in Guinea (Tolno *et al.*, 2016) also reflected that agricultural infrastructures are still a major constraint to smallholder commercialization. The latter challenges were in particular poor roads conditions and underdeveloped; the provision of transportation services were insufficient; and the other types of infrastructure supporting agricultural markets (e.g., for storage and processing)

were also underdeveloped. Problems related to storage facilities were also noteworthy in that 41.4% of farmers lack adequate storage facilities. A study conducted by Adekunle (2013) in the Eastern Cape Province of South Africa supports many other findings that many farmers are challenged by factors such as the use of technology and limited technology in their farming activities, lack of fertilizers, poor storage facilities and lack of market to information. Another study in South Africa by Matsane and Oyekale (2014) revealed the prominent constraints to smallholder commercialization which were: lack of access to credit, lack of access to storage facilities, lack of market information, inadequate access roads, small size of transport and high transportation costs. Another study by Khapayi and Celliers (2016) conducted in the Eastern Cape Province further highlighted the main limiting factors that prevent smallholder farmers from progression from subsistence to commercial farming. The uncovered limiting factors included the poor physical infrastructures such as roads, lack of transportation to the markets from the farms, lack of information and market infrastructures as well as the low education levels which results in an inability to interpret market information to be used in the production planning and marketing.

Another study done by Mpandeli and Maponya (2014) in Limpopo Province attested similar challenges faced by other farmers in other countries elsewhere which includes the lack of market information and market access inputs cost, for example fertilizer and herbicides, irrigation, cost of transport, and natural constraints such as drought.

#### **2.4 The role of extension officers in smallholder commercialization**

Extension officers' services are the most desirable tools for agricultural development support to farmers (Peshin *et al.*, 2015) and remain a critical component of the agricultural sector (Mahaliyanaarachchi *et al.*, 2006). An effective extension officer needs to have several skills and qualities for the success of commercial process. These include exceptional listening skills, timeliness, honesty, ability to get on with people, enthusiasm, common sense, initiative, ability to work unsupervised and have a good work ethic (van Niekerk, 2009). Extension officers are crucial for supporting farmers in technical and logistical support, and to access the relevant

technologies (van Niekerk, 2009). In another study conducted in KwaZulu-Natal Province, South Africa, exploring the role of agricultural extension, it was found that agricultural extension officers engage with farmers in technology transfer and the distribution of farming inputs, which poses challenges to biodiversity conservation. Extension officers were regarded as the key tools that hold capacity to promote ecological agriculture and sustainable farming (Abdu-Raheem, 2014).

A Vietnamese study asserted that the role of agricultural extension services is the most critical element as they are agents for dissemination of advanced technology for enhanced cultivation, animal husbandry, forestry, fisheries, processing industries, storage and post-harvesting of crops. Their role also included development of economic management skills and assistance with market information (Van Bo, 2012). In another study by Magoro and Hlungwani (2014) it was highlighted that the role of agricultural extension on smallholder commercialization in South Africa is to empower rural livelihoods, empower farmers by building social capital or improving resources management. In a study by Aliber and Hart (2009) conducted in Limpopo Province it was shown that extension officers were critical in encouraging farmers to grow high-input cash crops such as cabbages, onions, tomatoes, carrots, green beans and beetroot for local markets.

## **2.5. Policies for transformation of smallholder agriculture in South Africa**

The strategic plan undertaken by DAFF (2013) highlighted several policy instruments used in the facilitation of smallholder commercialisation in South Africa. The following policies were included:

- **Strategic Infrastructure project (SIP) 11**

The Strategic Infrastructure Project policy is one of the key elements that facilitate the development of infrastructures required by the entire agricultural sector. These include the improvement of roads, electricity, telecommunication, irrigation and security infrastructures. The latter infrastructures were the key elements in smallholder commercialisation.

- **Extension Recovery Programme**

There have been a number of successes regarding this policy intervention – for instance by materially increasing the presence of extension officers on the ground. Although it is widely recognised that it is not adequate, extension officers have been the best instrument in disseminating information and solving problems with farmers in the field.

- **National Mechanisation Programme**

This programme has been efficient in supporting access to mechanisation by all farmers. The provision of tractors in all provinces of South Africa – Limpopo Province included – has benefited the transformation processes of smallholder farmers.

A study conducted by Jari *et al.* (2013) highlighted that South Africa embraces several policies aimed at promoting smallholder commercialisation, inclusive of land reform, AgriBEE and sustainable development. Another study by Thamaga-Chitja and Morojele (2014) further highlighted CASP as one of the policy instruments that drives smallholder agriculture into commercial orientation. A report by DAFF (2013) highlighted support to smallholder through CASP funding. Specifically CASP rests on six pillars reflecting services required to transform small-scale agriculture, inclusive of provision of on and off-farm infrastructure, technical and advisory support, information and knowledge management, regulatory services, training and capacity building, marketing, business development and finance. The latter have been incorporated into Mafisa, the Ilima/Letsema pillars and other sustainable seeking farming models meant to promote risk sharing between producers and financial institutions. This is a clear indication that there is a drive towards transformation of smallholder agriculture to transit into commercial farming that is to participate in high value chains.

A study conducted by Lekgau and Jooste (2012) in South Africa attested the role of government subsidy in supporting smallholder farmers, that South Africa makes the provision of farm inputs in the form of subsidy to support poor resources farmers. The inputs support includes the provision of seed, fertilisers and mechanisation such as tractors. This reflects subsidy policy as a key element in agricultural sectors as a whole.

Chauke (2016) highlighted the South Africa Post-Harvest Innovation (PHI) Programme as one of the main policy that seeks to influence post –harvesting handling in South Africa. The aim of this policy is to develop innovative technologies for the fresh fruit value chain. However, smallholder farmers have derived minimal benefit from this policy as their participation in the export market is very low. This policy could be vital to the citrus smallholder farmers within the Mutale area.

A report undertaken by Mnkeni and Mutengwa (2013) indicated that the Comprehensive Rural Development Programme (CRDP) and Policy for Recapitalization and Development Programme (RDP) were launched by the Department of Rural Development and Land Reform in 2013 as one of the South African tools to support the development of smallholder agriculture. The CRDP aligns the RDP to the National Development Program (NDP) vision for 2030 which has three focus areas for Agriculture namely, successful land Reform; employment creation and strong environmental safeguards. These policies ensure transformation of smallholder agriculture to commercial farming through the following principles:

- Rapid transfer of agricultural land to blacks without distorting the land market or business confidence;
- Sustainable production based on capacity building prior to transfer through incubator, mentorships and accelerated forms of training;
- Development of sound institutional arrangement to monitor markets against corruption and speculation; and
- Alignment of transfer targets with fiscal realities, and enhanced opportunities for commercial farmers and organized industry to contribute through mentorships, training, commodity chain integration and preferential procurement.

This is an indication that South Africa as a country is characterised by several instrument to address the transformation of smallholder agriculture to commercial orientation

## 2.6. Chapter summary

Smallholder farming sector in Limpopo Province is dominated by females which constitute 80% of the gender dimensions. Similarly to other provinces of South Africa, smallholder farming sector in Limpopo is characterised by small sizes of farms to produce at maximum for either home consumption or marketing. Farmers largely depend on the communal land tenure system rather than being owners of or renting the land. The following are regarded as the fundamental elements to transform smallholder farming to commercial farming; access to education and training, membership to agricultural organisations, household income, access to credit, market and farm inputs, land tenure and size as well as the age of a farmers. Challenges like water shortage, farming inputs, lack of information, infrastructures, access to markets, and distance to market and low level of education by farmers are the obstacles to the commercialisation of smallholder agriculture in South Africa and elsewhere in the world. The role of agricultural extension officers has been highly recognised as governmental tools to facilitate smallholders' transformation in rural areas all over South Africa and in other developing countries. In South Africa, several policies have been used as the drivers of smallholder commercialisation. These policies included the CASP, SIP 11, and land reform, AgriBEE, Subsidy, Extension Recovery Programme and National Mechanisation Programme. It is believed that the success of these policies will enhance the progression of smallholder from subsistence farming to commercial farming in South Africa as a whole.

## CHAPTER 3

### METHODOLOGY

#### 3.1 Introduction

This chapter outlines the methodological framework that was adopted for undertaking of this research. It discusses the study area, research design, population and sampling procedure, data collection method, data analysis, the expected outcomes and ethical considerations.

#### 3.2 Study area

The study was conducted at the Mutale Local Municipality (MLM) in Vhembe District of Limpopo Province.

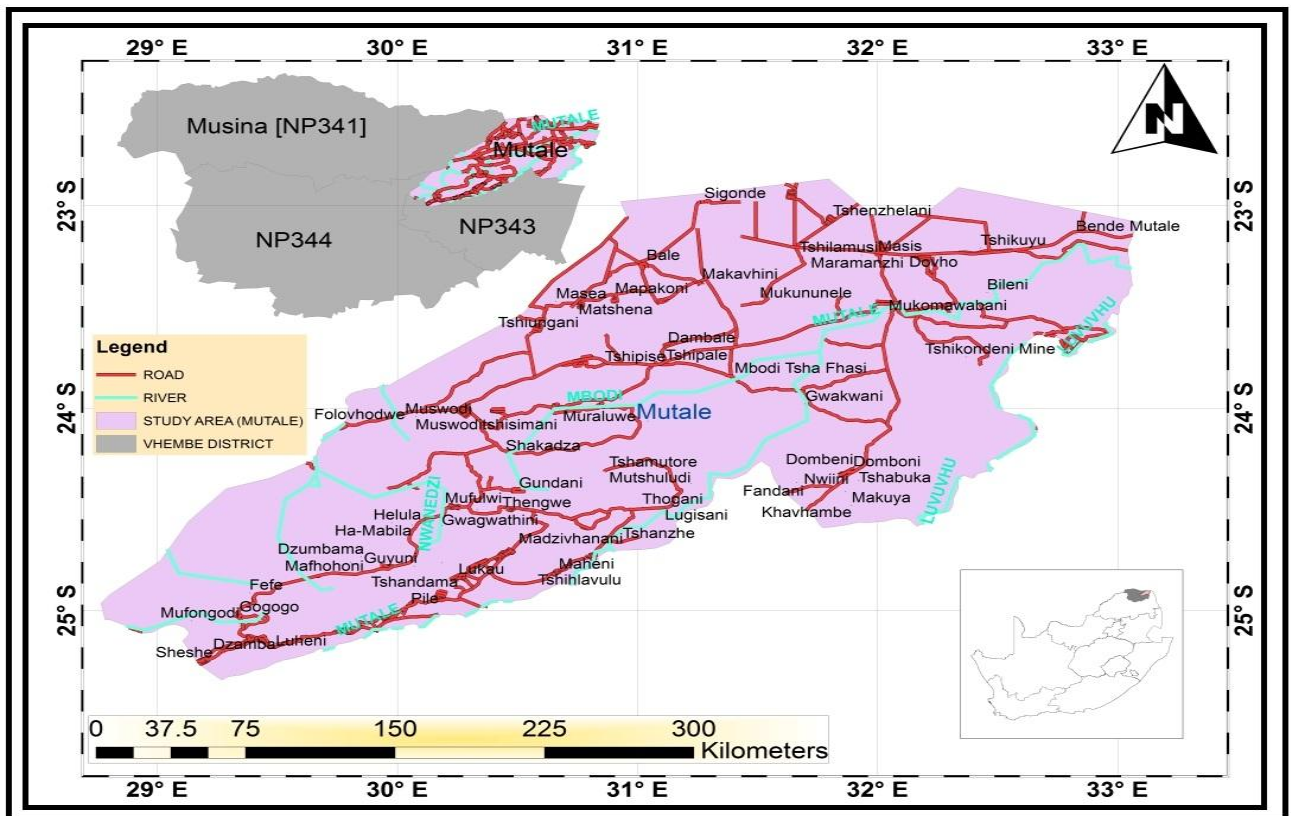


Figure 3.1: Map of Vhembe District showing Mutale Local Municipality (University of Venda GIS section, 2015)

The MLM is situated in the far north-eastern part of the Limpopo Province, bordering Zimbabwe on the north and Mozambique on the eastern side of the Kruger National Park (Local Government, 2015). The population of Mutale Local Municipality is spread over the former Venda homeland area. The area largely consists of communally occupied land which includes a large number of rural settlements administered by tribal authorities (Steyn *et al.*, 2010).

### **3.3 Research Design**

A mixed methods design approach was used in this study. Mixed method approach is one of the methods in which researchers tend to base knowledge and claims on pragmatic grounds. It employs strategies that involve collecting data related to specific research problem, either simultaneous or sequentially related to specific research problems (Creswell, 2003). This study employed the data collection of both numeric information as well as text information which finally represent both quantitative and qualitative information. The use of both methods results in a better understanding of the research problem. In this study, quantitative data were used to determine the socio-economic characteristics of the households, while qualitative data were used to assess factors that contribute to the transformation of a smallholder farmer to a commercial one and the view of extension officers regarding the factors that hamper commercialization. According to Creswell and Plano Clark (2011), this design enables the documentation of the results from different perspectives. It also enables comparison of data from multiple levels of different respondents. In this study, more weight was placed on the quantitative strand.

### **3.4 Population and sampling**

A pre-feasibility study was conducted in the study area. Farmers in the study area produced under three farming systems, i.e. vegetable production under irrigation, maize farming under dry land farming conditions and fruit production focusing on citrus crop production. The focus of this study was not on the actual production quantities but rather on the proportion of farmers in each of the three farming systems.

The respondents of this study were selected from the smallholder farmers in Mutale Local Municipality. A population of 1 600 smallholder farmers was used to select the sample of 153 respondents from the three farming systems as shown in Table 3.1. The populations of farmers under these three farming systems were 485; 954 and 161 respectively, adding up to 1 600 farmers. These farmers were scattered in four agricultural ward services in Mutale Local Municipality, which was: Tshixwadza, Tshipise, Tshishivhe and Masisi. Clustered proportional random sampling was adopted to select the participants to this study.

Clustered proportional random sampling is one of the efficient sampling techniques that is designed to reduce travelling costs if in-person data collection or when the follow-up is required by the researcher (Green *et al.*, 2006). Clustered proportional sampling represents a more complicated form of cluster sampling in which larger clusters are further subdivided into smaller, more targeted groupings for the purposes of surveying. This sampling technique creates representative sample of the population than a single sampling technique (Agresti and Finlay, 2008).

In the final analysis the sample consists of 46 farmers for vegetables under irrigation, 91 for maize farmers under dry land and 16 farmers for citrus fruit production.

The study also included extension officers in Mutale Local Municipality as key informants working closely with the farmers. There were 20 extension officers working with crop farming in all three farming systems (vegetable production under irrigation, maize farming under dry-land conditions and; citrus fruit production system). All of them were selected to participate in the study to give their views regarding the hampering factors to smallholder commercialization.

**Table 3.1: Reflections of the population and ultimate samples per ward in the three farming systems in the four ward services in Mutale Local Municipality**

<b>Farming systems</b>	<b>Agricultural Ward services</b>	<b>Populations(N)</b>	<b>Ultimate samples(n)</b>
Irrigation(vegetables)	Tshixwadza	215	20
	Tshipise	13	12
	Tshishivhe	75	8
	Masisi	65	6
	<b>Subtotal</b>	<b>485</b>	<b>46</b>
Dry-land(Maize)	Tshixwadza	153	15
	Tshipise	250	24
	Tshishivhe	244	23
	Masisi	307	29
	<b>Subtotal</b>	<b>954</b>	<b>91</b>
Fruit productions(Citrus)	Tshixwadza	103	9
	Tshipise	39	3
	Tshishivhe	9	2
	Masisi	10	2
	<b>Subtotal</b>	<b>161</b>	<b>16</b>
<b>Total</b>		<b>1600</b>	<b>153</b>

(Source: survey, 2016, n=153)

### **3.5 Data collection method**

#### **3.5.1 Formal household survey**

Primary data were collected from farmers in the Mutale Local Municipality. Data were collected by means of a structured questionnaire which included a mixture of open- and close-ended questions. The questionnaire was used to collect the following data: social and economic characteristics of the farmers that could assist to transform smallholder farmers to commercial farmers and the challenges faced by farmers in the transformation processes. Another questionnaire was also administered to assess the views of extension officers on factors hampering smallholder farmers to transform to commercial farming.

#### **3.5.2 Secondary data collection**

Secondary data were obtained from published journal articles, websites and government agencies, both at the provincial and national levels.

### **3.6 Data analysis**

The Statistical Package for Social Scientists (SPSS) version 24 computer program was used for data analysis.

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

Descriptive statistics which included the cross tabulation and frequency distribution was adopted to analyse the collected data which covered socio-economic characteristics of the respondents. The socio-economic characteristics included age, gender, and educational level achieved by farmers, information on household income, land tenure and size of the land, access to market and information, access to credit and inputs, membership to agricultural organization and access to trainings and access to agricultural extension services. All the latter information was assumed as the critical factors that would have assisted farmers in Mutale Local Municipality to transform from smallholder to commercial farming.

### **3.6.2 Assessing challenges faced by smallholder farmers to transform from subsistence to commercial farming**

Qualitative data were collected on the challenges faced by farmers which were analysed using thematic content analysis. Thematic content analysis is an independent qualitative descriptive approach which is described as “a method for identifying, analysing and reporting patterns (themes) within data” (Braun and Clarke, 2006). Using thematic analysis, information that was similar or related was grouped together in category. Data were grouped into themes or patterns then coded and transferred into Statistical Package for Social Scientist (SPSS) version 24. The data were then analysed and interpreted using descriptive statistics which included frequency distribution. Farmers stated their major problems in their daily farming

### **3.6.3 The views of extension officers regarding issues that hamper subsistence farmers from the transformation processes**

This study realised the role of extension officers in rural agriculture as they are the government vehicle to transform the smallholder agricultural sector. Extension officers’ views regarding the issues that hamper smallholder farmers from transformation processes were considered critical in confirmation challenges facing the sector. Therefore, a questionnaire which provided Likert Scale responses was developed. The Likert scale was used to assess the data and analysis based on descriptive statistics using frequency distributions. Likert scale is a commonly used technique considered as an important rating format for quality measurement (Allen and Seaman, 2007). All (20) extension officers in the Mutale Local Municipality participated in this study. All participants responded to the Likert type questions based on four levels of agreement (strongly agree, agree, disagree and strongly disagree). Data (Likert scale responses) were collected and captured into the SPSS version 24, then descriptive statistic (frequency distribution) was used to analyse data. All the respondents gave their responses based on several issues that affect commercialization process.

### 3.6.4 Inferential statistic (Model specification)

In this study market participation by smallholder farmers is equated to the transformation from subsistence farming to commercial farming. Farmers were asked if they have a market for their farm produce or not. Therefore, this study saw this as necessary to find out the potential socio-economic factors that would assist them to access markets, that is to be commercial oriented. The market access was not measured by the percentage sold or the output sold, but measured by the primary reason and the ability to find a target market for sales of farm produce. Therefore, inferential statistic was used to determine factors that would have assisted farmers to access markets in Mutale Local Municipality. Binary logistic regression model was used to determine socio-economic characteristics that would have influenced farmers' ability to access markets. The results from Binary regression model predicted the socio-economic factors that could be taken into consideration by farmers themselves and government policy makers as a major driver of smallholder commercialisation.

Binary logistic regression is considered useful for situations in which the prediction of the presence or absence of a characteristic or outcome based on values of a set of predictor variable is the case (Norusis, 2004). According to Wooldridge (2009) the term "logit" refers to the natural logarithm of the odds (log odds) which indicates the probability of falling into one of the two categories on some variable of interest. Harrell (2001) highlighted that, binary logistic has only two categories in the response variable, that is, event A and non-event A. The model shows how a set of predictor (explanatory) variables ( $X$ 's) are related to a dichotomous response variable  $Y$  ( $\ln(\frac{P_i}{1-P_i})$ ). The dichotomous response variable  $Y=0$  or  $1$  with  $Y + 1$  denotes the occurrence of the event of interest while  $Y = 0$  denotes otherwise. The dummy variables, also known as indicators and bound variables, characterize dichotomous responses.

In this study, since only two options were available, namely "access to the market" or "no access to the market" a binary model was set up to define  $Y=1$  for situation where the farmers accessed the market and  $Y=0$  for situation where the farmer did not access the market. Assuming that  $X$  is

a vector of explanatory variables and  $p$  is the probability that  $Y=1$ , two probabilities relationship as stated by Wooldbridge (2009) can be considered as follows:

$$p(Y=1) = \frac{e^{\beta X}}{1+e^{\beta X}} \quad (1)$$

$$p(Y=0) = 1 - \frac{e^{\beta X}}{1+e^{\beta X}} = \frac{1}{1+e^{\beta X}} \quad (2)$$

Woodridge (2009) concluded that since Equation (2) is the lower response level, that is the probability that, farmers did not access the market, this will be the probability to be modelled by the logistic procedure by convection. Both equations present the outcome of the logit transformation of the odds ratios which can alternatively be represented as:

$$\text{logit} [\theta(x)] = \log \left[ \frac{\theta(x)}{1-\theta(x)} \right] = \alpha + \beta_1 X_1 + \dots + \beta_n X_n + u_T \quad (3)$$

and thus allowing its estimation as a linear model for which the following definitions apply:

$\theta$  = logit transformation of the odds ratio;

$\alpha$  = the intercept term of the model

$\beta$  = the regression coefficient or slope of the individual predictor (or explanatory) variables modelled and

$X_i$  = the explanatory or predictor variables.

$u_T$  = error term

The foregoing operations were feasible within the SPSS package. In relation to Equation (3) the analysis generated the odd ratios using the maximum likelihood procedure (Field, 2005). The logistic regression in this study is specified as:

$$Y_i = \alpha + \beta_1 X_1 + \dots + \beta_n X_n + u_T$$

The expected outcomes and the interpretations of explanatory or predictor variables included in the analysis are represented in Table 3.2.

**Table 3.2: Specification of explanatory variables for Binary logistic regression**

Variables	Specification	Expected Outcome	
		Sign	Interpretation
X <sub>1</sub> = Gender	Dummy; 0=female, 1=male	+	The probability of being a male farmer, increases the probability to access the market
X <sub>2</sub> = Age	scale variable	-	As age increases, the probability of farmers to access the market decreases
X <sub>3</sub> = educational level	Dummy; 0=non educated, 1= primary, 2= secondary, 3=tertiary and 4=other	+	Farmers with highest level of education, are more likely to access the market.
X <sub>4</sub> = Household income	scale variable	+	As income increases, the probability of farmers to access the market increases
X <sub>5</sub> = Access to credit	dummy; 0= no, 1= yes	+	As access to credit increases, the probability of farmers to access market also increases.
X <sub>6</sub> = Access to trainings	dummy; 0= no, 1= yes	+	As access to trainings increases, the probability of farmers to access the market also increases.
X <sub>7</sub> = Membership to agricultural organisation	dummy; 0= no, 1= yes	+	The more farmers have membership to agricultural organisations the more they have access to the market
X <sub>8</sub> =Access to market support services	dummy; 0= no, 1= yes	+	As access to the market support services increases, the probability of farmers to have access also increases.
X <sub>9</sub> = Land size	scale variable	+	As land size increases the probability of farmers to access market also increases
X <sub>10</sub> = supply of Inputs	dummy; 0= no, 1= yes	+	As farmers receive inputs adequately, the probability of access to market also increases

### 3.7 Expected outcome of the study

It was expected that socio-economic characteristics will assist the transformation processes of smallholder farmers to commercial farmers. It was also expected that econometric model will reveal the socio-economic characteristics that could have assisted farmers to access market

which could also diversify their farming activities. The extension officers were also expected to hold different views regarding the issues that hamper commercialization that would be informative for future academics, farmers' leaders, government and non-governmental stake holders.

### **3.8 Ethical considerations**

The researcher requested for permission to conduct the study at various levels, commencing with relevant structures at the University of Venda (School Higher Degrees and University Higher Degrees Committees). The Mutale Local Municipality was also engaged before conducting the study. Also, all responsible government agencies were requested for permission. Permission from farmer associations that represent the interests of farmers was also requested and obtained.

All participants were given clarity on the nature of the study and how the results would be used. These compelling procedures were done before distributing the questionnaires to all participants during data collection. Questionnaires were administered to individual respondents by the researcher during the process of data collection. All participants (farmers and extension officers) were given a written consent form which explained what the study would focus on and their obligations and rights. In order to ensure that participation is voluntary, all the data collection tools were accompanied by a written consent form which summarised the study and its objectives. The consent form is indicated by Appendix 1, whereas the questionnaire is indicated by Appendix 2, and 3 respectively. Each questionnaire included information sheets on the cover page which shows the purpose of the study, participants' rights, confidentiality and time commitment.

The consent forms contained a clause that informed the participants that they could choose to discontinue their participation at any time. A confidentiality and anonymity declaration was also included in the form.

## CHAPTER 4

### RESULTS AND DISCUSSION

#### 4.1 Introduction

This chapter presents and discusses the results of the study. The data used in this chapter was obtained from sampled farmers and extension officers in the Mutale Local Municipality through structured and unstructured questionnaires. The next section outlines the descriptive outcomes of the surveyed data. This is followed by presentation of challenges faced by farmers, inferential statistical analyses and discussion of results.

#### 4.2 Descriptive Results of Survey Data

The main focus of this section was to analyse socio-economic characters or aspects that could have assisted farmers in Mutale Local Municipality to transform from subsistence to commercial farming. These factors included gender, age, level of education and training received by farmer, household income, access to credit, access to market and inputs, land tenure and size and membership to agricultural organizations.

##### 4.2.1 Socio- economic characteristics of farmers that would assist them to transform from smallholder to commercial farming

###### 4.2.1.1 Gender, age and educational level attainment by respondents

Socio-economic characteristics of farmers are crucial for the success of smallholder commercialization, more especially age and educational level attained by farmers (Marty *et al.*, 2012). Table 4.1 presents some socio-economic characteristics from the sample which comprised of age, educational level and gender of the respondents with respect to three farming systems (vegetables farming under irrigation, maize farming under dry land and fruit production) in the Mutale Local Municipality (MLM). These were some of the socio-economic factors that

would have contributed to the transformation from subsistence to commercial farming in the Mutale Local Municipality.

**Table 4.1: Gender, age and educational level of farmers from the three farming systems in Mutale local Municipality**

		Irrigation(vegetables)	Dry land(Maize)	Fruit production(citrus)	Total
		%	%	%	%
Gender	Male	10.5	24.8	8.5	43.8
	Female	17.0	35.9	3.3	56.2
	<b>Subtotal</b>	<b>27.5</b>	<b>60.8</b>	<b>11.8</b>	<b>100.0</b>
Age	Youth: ≤35	2.0	6.5	1.3	9.8
	Aged: 36-59	15.7	27.5	3.9	47.1
	Elderly: >59	9.8	26.8	6.5	43.1
	<b>Subtotal</b>	<b>27.5</b>	<b>60.8</b>	<b>11.8</b>	<b>100.0</b>
Educational level	No schooling	7.2	15.7	0.7	23.5
	Primary	10.5	19.6	2.6	32.7
	Secondary	8.5	20.3	3.3	32.0
	Tertiary	1.3	4.6	5.2	11.1
	Other	0.0	0.7	0.0	0.7
	<b>Subtotal</b>	<b>27.5</b>	<b>60.8</b>	<b>11.8</b>	<b>100.0</b>

(Source: survey, 2016, n=153) Pearson Chi-Square=6.789, p-value=0.034; Pearson Chi-Square=3.319, p-value=0.506; Pearson Chi-Square=25.197, p-value=0.001, (gender, age and education versus three farming system respectively)

Many farmers that participated in the study were females (56.2%) ranging between the ages of 36-59 years (47.1%). The participation of youth in the study was very low (9.8%) compared to elders (43.1%). The highest proportion of farmers practised dry land farming (60.7%) compared to the other two farming systems. Some farmers were either illiterate (23.5%) or semi-literate [attended primary schooling] (32.7%). A substantial proportion (32.0%) had attained the secondary schooling (grades 8 to 12) with a small proportion that had reached tertiary level education (11.1%). The results of the Pearson Chi-square reflected that there is a statistical significant relationship between gender, educational level and the three farming systems in the Mutale Local Municipality, as shown by both p-values less than  $\alpha=0.05$ . These results imply that there is a relationship that exists between gender, educational level and the three farming systems. Regarding the age, there was no significant difference ( $P>0.05$ ). This implies that age did not influence farmers to operate in irrigation system, dry land farming or fruit production system.

#### **4.2.1.2 Household income and sources**

Household income and main sources thereof are shown in Table 4.2 with respect to the three farming systems practised in the Mutale Local Municipality. The latter are divided into two broad categories of farm and non-farm sources. Farm incomes included those emanating from sale of farm produce while non-farm sources include pensions, social grants, remittance, wages and salaries and other sources. The results show that the majority (88.2%) of farmers were characterised by low monthly income ranging between R100-R5000 while a few (3.3%) were within the high income group (above R10000 per month) mostly within the fruit production system of farming. Comparatively, most (45.1%) farmers generated their income from social grants rather than from farming (17%). Self- and full employment activities generated the least monthly income (8.5% and 11.1% respectively). Most (56.9%) of the low income group practised dry land maize production. The latter could be reflective of negative impact of climate change leading to lower rainfall patterns in the area and thus a focus on production for home consumption rather than commercial orientation. The latter could be reflective of negative impact

of climate change leading to lower rainfall patterns in the area and thus a focus on production for home consumption rather than commercial orientation.

**Table 4.2: Famers household monthly income and their main sources per farming system**

		Irrigation (vegetables)	Dry land(Maize)	Fruit production(citrus)	Total
		%	%	%	%
Household income/month	Low income:<5000	23.5	56.9	7.8	88.2
	Middle income:5000- 10000	3.9	3.3	1.3	8.5
	High income:>10000	0.0	0.7	2.6	3.3
	<b>Subtotal</b>	<b>27.5</b>	<b>60.8</b>	<b>11.8</b>	<b>100.0</b>
Main sources of income	Agriculture	7.2	7.8	2.0	17.0
	Full employment	2.0	5.9	0.7	8.5
	self-employment	3.3	7.2	0.7	11.1
	Social grant	9.2	32.7	3.3	45.1
	Mixed	1.3	2.6	1.3	5.2
	Other	4.6	4.6	3.9	13.1
	<b>Subtotal</b>	<b>27.5</b>	<b>60.8</b>	<b>11.8</b>	<b>100.0</b>

(Source: survey, 2016, n=153), Pearson Chi-Square; 26.673 and 17.653, p-value= 0.000 and 0.61, respectively.

The results of the Pearson Chi-square test indicated that there is a statically significant relationship exists between household income and the three farming systems, i.e. the p-value computed was less than  $\alpha=0.05$ . The result implies that households' income level influences

farmers to operate in irrigation, dry land farming or fruit production systems. Farmers with high income were likely to practice under irrigation system and fruit production while low income farmers practice dry land farming for maize because it a cheap. The Pearson Chi-square test indicated that there is no significant relationship exist between the main source of income and the three farming systems, that is the p-value computed was greater than  $\alpha=0.05$ . This implies that main source of income does not influence farmers to operate in irrigation, dry land farming or fruit production systems.

#### **4.2.1.3 Land size and tenure systems**

The finding regarding the land size, and tenure systems as practised by farmers is shown in Table 4.3. Many farmers depended on communal land (90.8%) as compared to rental (3.9%) and private land (5.2%) occupation. The majority (81.7%) of farmers occupied less than 5 hectares especially under dry land conditions (51.0%). Fewer (15.7%) farmers owned between 5 to 10 hectors while very few (2.6% ) occupied in excess of 10 hectors of land. The dominance of farmers with low hectarage could impact on crop diversification and application of productive enhancing technologies such as mechanization.

The results of the Pearson Chi-square test indicated that there is also a significant relationship or difference between land tenure and size within the three farming systems. Both the p-value computed for each variables versus the three farming systems was less than  $\alpha=0.05$ . Based on these results, land tenure and size influence farmer to practice irrigation farming, dry land farming or fruit production framing system. Farmers in communal lands tend to practice dry maize farming as it is cheaper than when irrigating while farmers renting land tend to practice irrigation farming for vegetables for profit maximization. Regarding the farm size, farmer with large area of land turn to practice fruit production farming as it requires large space of land compared to vegetable and maize production.

**Table 4.3: Tenure system and land size per farming system in the Mutale Local Municipality**

		<b>Irrigation (vegetables)</b>	<b>Dry land(maize)</b>	<b>Fruit production(citrus)</b>	<b>Total</b>
		<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>
Tenure system	Private land	0.0	3.3	2.0	5.2
	Rented land	2.6	1.3	0.0	3.9
	Communal land	24.8	56.2	9.8	90.8
	<b>Subtotal</b>	<b>27.5</b>	<b>60.8</b>	<b>11.8</b>	<b>100.0</b>
Land size	:<5ha	24.8	51.0	5.9	81.7
	:5-10ha	2.6	8.5	4.6	15.7
	:>10ha	0.0	1.3	1.3	2.6
	<b>Subtotal</b>	<b>27.5</b>	<b>60.8</b>	<b>11.8</b>	<b>100.0</b>

(Source: survey, 2016, n=153) Pearson Chi-square (P-value < 0.05, 0.020 and 0.003 respectively)

#### 4.2.1.4 Marketing information

Access to market is an economic activity that could be vital in transforming farmers from smallholder to commercial farming. Table 4.3 presents the distribution of respondents according to their access to market, including the main targeted market. More than half (55.6%) of the farmers did not have access to markets for farm produce, implying that many farmers in the MLM produced for home consumption. Out of those that could access the market, many (27.5%) sold their produce to the local market with few (11.8%) accessing the national markets. Very few sold their produce within the Vhembe district (in which the MLM falls) and Limpopo Province

(2.6% each). Most of those that market their produce locally were operating within the irrigation system. (13.7%). Table 4.5 also shows that many farmers produced for home consumption (55.6%).

**Table 4.4: Market access and main target market within the three farming systems adopted by farmers of Mutale Local Municipality**

		Irrigation (vegetables)	Dry land (Maize)	Fruit productio n(citrus)	Total
		%	%	%	%
Market access	Farmers with market access	22.2	11.1	11.1	44.4
	With no market access	5.2	49.7	0.7	55.6
	<b>Subtotal</b>	<b>27.5</b>	<b>60.8</b>	<b>11.8</b>	<b>100.0</b>
Main target Market	Local	13.7	9.2	4.6	27.5
	Within district	2.0	0.7	0.0	2.6
	Within Limpopo	1.3	0.0	1.3	2.6
	National	5.2	1.3	5.2	11.8
	Home consumption	5.2	49.7	0.7	55.6
	<b>Subtotal</b>	<b>27.5</b>	<b>60.8</b>	<b>11.8</b>	<b>100.0</b>

(Source: survey, 2016, n=153) Pearson Chi-Square; 64.401 and 81.771 respectively, p-value= 0.000

The result of the Pearson Chi-Square between market access, the main target market and the tree farming system was less than the p-value =0.05. Therefore it can then be concluded that there is a difference between farmers with and no access within the three farming system. It shows that most farmers with market access were irrigators compared to dry land farmers and fruit producers. This is a clear indication that farmers with market access will tend to focus on irrigation farming system to produce high yield and quality products for markets. Therefore

farmers with market access and producing vegetables could be the best target when commercialising the smallholder agricultural sector in Mutale area where as citrus farmers were associated with national markets than the other two farming systems.

Table 4.5 presents farm produce per market participation in Mutale Local Municipality. Vegetables, maize and citrus fruit were the main common crops produced in the Mutale Local Municipality. The majority (60.8%) of the respondents produced maize for home consumption (49.7% non-market participation compared to only 11.1% that marketed their produce). Most farmers that participated in the market were those that practised vegetables farming (22.2% of the total sample).

**Table 4.5: Farm produce per market participation in Mutale Local Municipality**

	Market participation		
	Non-participants	Participants	Total
Farm produce	%	%	%
Vegetables	5.2	22.2	27.5
Maize	49.7	11.1	60.8
Fruits	0.7	11.1	11.8
<b>Total</b>	<b>55.6</b>	<b>44.4</b>	<b>100</b>

(Source: survey, 2016, n=153) Pearson Chi-Square; 47.167, p-value= 0.000

The results of the Chi-square show whether the type of farm produce was statistically influencing farmers to participate in the market or not, i.e. the p-value was less than  $\alpha=0.05$ . Farmers producing vegetables were most likely to participate in the market than other farmers from dry land and fruit producers.

#### 4.2.1.5 Other socio-economic factors that could assist subsistence farmers with transformation

Table 4.6 reflects other socio-economic factors that could impact on transformation of farmers from subsistence to commercial farming in Mutale Local Municipality. In interpreting the table, it is important to note that each of the factors could have had an impact on all farmers, and thus the repetitive sub-totals.

**Table 4.6: Access to other socio- economic factors by farmers in Mutale Local Municipality**

		Percentage
Extension services	With access	63.4
	With no access	36.6
Access to credit	With access	13.1
	With no access	86.9
Access to training	With access	46.4
	With no access	53.6
Access to agro-organizations	With access	22.9
	With no access	77.1
Access to information	With access	62.1
	With no access	37.9
Supply of farming inputs	With access	28.1
	With no access	72.9

(Source: survey, 2016, n=153)

The findings reveal that the majority (63.4%) of farmers had access to extension services and information (63.4% and 62.1% respectively) as against credit (only 13.1%), training (46.4%), membership to agricultural organizations (only 22.8%) and inputs (28.1%). Farmers that had access to some of the identified factors mentioned that both government and non-government organizations played significant roles in availing these essentials, especially with regard to accessing government subsidies for acquisition of seeds and training. Access to credit proved to be a big challenge to farmers in the MLM (all farming systems) with many (86.9%) failing to access the resource. Some farmers pointed to low income and pay-back as major causal factors for failure to accessing credit. Despite the provision of government subsidy to farmers, many (71.9%) pointed to inadequacy of input supply as a major impediment to their farming activities and thus their dependence on other sources such as household members for input funding. Access to agricultural organizations was another major constraint, with more than three quarters (77.1%) reporting non-membership.

Table 4.7 presents infrastructure support received by Mutale Local Municipality farmers. Only few farmers had transportation services support and roads facilities (33.29% and 45.43% respectively) while only 7.63% had storage facilities. Only few (13.64%) had access to transport, roads facilities and storage facilities.

**Table 4.7: Infrastructure support received by Mutale Local Municipality farmers**

	Percentage
Transportation of produce	33.29
Roads	45.43
Storage facilities	7.63
All of the above	13.64

(Source: survey, 2016, n=153)

### 4.3 Challenges faced by farmers in Mutale Local Municipality

Through thematic content analysis the following themes regarding the challenges faced by farmers emerged; low mechanization, shortage of water, poor infrastructures, poor safety and security on farm properties, pest and diseases, lack of access to inputs and access and distance to markets. (See, Table 4.8). Many respondents (80.4%) ranked shortage of water as the second main constraint in their daily farming activities. Low mechanization (technology) was regarded as the main problem facing many respondents (92.8%). More than half of the farmers also pointed out that infrastructure and access to market and long distance from the point of farming is still a challenge in the Mutale Local Municipality (69.3% and 60.7% respectively). Farmers with access to the market pointed out that selling their produce to local people was the most accessible option to dispose of their produce. Some farmers indicated that irrigation structures were the main constraint affecting their production.

**Table 4.8: Major challenges faced by farmers in the Mutale Local Municipality**

Challenges faced by farmers in their farming activities	Percentages (%)
Low mechanization	92.8
Shortage of water	80.4
Poor infrastructure	69.3
Poor safety and security on farm property	17.0
Pest and disease	17.6
Distance to markets	60.7

(Source: survey, 2016, n=153)

#### **4.4 Views of extension officers regarding the factors that hamper subsistence farming from transformation**

As articulated in the methodology section, this study sought to unearth the views of agricultural extension officers regarding the extent to which the smallholder sector was transforming towards commercialisation. Reasons for seeking their views were mainly that they are usually considered as agents that not only provide the necessary farming knowledge to the sector, but also critical as distributors of targeted inputs such as fertilizers and seeds. Their views regarding the contribution of factors such as access to land, produce diversification as a hedge against certain crop failures, market access, financial support, other critical infrastructure (such as roads, electricity, communication, etc.) were seen as critical success factors that could drive the transformation process. Table 4.9 seeks to assess the views of extension officers regarding factors that hamper smallholder farmers from transforming their farming enterprises. The majority of extension officers (80%) saw land ownership as a major stumbling block to smallholder farming ventures. Almost an equal proportion either agreed (40%) or disagreed (35%) with regard to practising diversified farming while market access was generally seen as being plentiful (85% of respondents). Other problem areas were observed to be lack of financial support (90%) climate change (85%), age (65%) low mechanisation and lack of supportive infrastructure (85% respectively).

The unavailability of land as a critical production factor is a serious challenge that needs attention. Mutale Local Municipality has been targeted as an important zone for the production of cash crops in Limpopo Province (as informed by the Chief Extension Officer for farmer support in Vhembe District). Without sufficient land this policy intervention is unlikely to succeed. Mutale is generally a very dry area, although water is largely accessed from two rivers, Nandi and Limpopo. However, as many smallholders lack irrigation equipment, they largely depend on rain water for irrigation purposes.

**Table 4.9: Views of extension officers regarding challenges that hamper farmers from commercialization in the Mutale Local Municipality**

Likert Scale Item	Likert Scale responses (%)				
	SA	A	D	SD	Total
Ownership to land	30	50	20	0.00	100
Diversification of farming produce	10	40	35	15	100
Availability of market for farm produce	30	55	15	0.00	100
Financial support	40	50	10	0.00	100
Climatic change	35	45	20	0.00	100
Use of Genetic Modified Inputs(GMI)	10	35	35	20	100
Aging farmers	30	35	30	5	100
Low mechanization	30	55	15	0.00	100
Poor infrastructure	20	65	10	5	100

**Source: Survey Results (2016): SA= Strongly agree, A = Agree, D= Disagree, SD=Strongly disagree**

The almost impartial views by extension officers regarding crop diversification may be indicative of the above challenge. The view that market access was not a problem contradicts the views of smallholder farmers (see Table 4.4). This view could however be emanating from locational advantages of smallholder farming operations within the area, especially in that the nearest formal fresh produce markets (the two nearest towns of Musing – about 60km away, and Mikado – about 150km away) leave the informal local market as the easiest and largely underserved location for produce disposal. However, this study reflected the clear link between the results from farmers and extension officers. The view that mechanization and infrastructure was the main problem in Mutale Local Municipality supported the views of the farmers (see Table 4.4) which give the warrants attention to those challenges.

Successful transformation towards commercialisation requires effective financial support, moderate climate change risk, relatively younger farmers, mechanisation and good infrastructure. Extension officers' views that all of the above are challenges facing the Mutale

smallholder farming sector require appropriate policy implementation strategies as these are mostly in place.

## **4.5 Inferential statistical analysis**

### **4.5.1 Socio-economic characteristics that affect farmers to access the market**

This section represents the correlation matrix and the result of the binary regression model in determining the socio-economic characteristics that affect farmers' to access the market for their farm produce to Mutale Local Municipality. The socio-economic variables used in the model included the gender( $X_1$ ), age( $X_2$ ), educational level( $X_3$ ) household income( $X_4$ ), access to credit( $X_5$ ), access to training ( $X_6$ ), membership to agricultural organizations ( $X_7$ ), access to market support services ( $X_8$ ), land size( $X_9$ ) and adequate supply of inputs( $X_{10}$ ).

#### **4.5.1.1 Correlation analysis**

Correlation matrix is a measure of the direction and strength of a linear relationship among variables (Benoit, 2010). A correlation matrix results is shown in Table 4.10. The purpose was to ensure that there are none or weak correlations between variables. A correlation ( $r$ ) = 1 reflects very strong positive relationship, while a correlation of  $-1$  reflects a very strong negative relationship (as one variable increases the other to either increase or decrease). The sign reflects the direction of the relationship while the number reflects its strength. The results in Table 4.10 show that there was a weak correlation between predictor variables. This is reflected by the low correlations between most variables. This implication is that the variables are suitable for predicting the dependent variable.

**Table 4.10: Correlation Matrix**

Variables	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>	X <sub>9</sub>	X <sub>10</sub>
Gender of the respondents (X <sub>1</sub> )	1.000									
Age (X <sub>2</sub> )	0.124	1.000								
Educational level (X <sub>3</sub> )	0.192*	0.373*	1.000							
Household income (X <sub>4</sub> )	0.135**	-0.113	-0.138*	1.000						
Access to credit (X <sub>5</sub> )	0.071**	0.089	-0.056*	-0.063*	1.000					
Access trainings (X <sub>6</sub> )	-0.001	.0.010	-0.053	0.040	0.127	1.000				
Membership to agricultural organisations (X <sub>7</sub> )	0.095	0.136	0.124	-0.043*	-0.050	-0.211*	1.000			
Access to market support services (X <sub>8</sub> )	-0.098	-0.057	0.010	-0.070	-0.009	-0.098*	0.032*	1.000		
Land size (X <sub>9</sub> )	0.041	-0.098	-0.103	-0.030	0.346*	-0.246*	0.112*	0.051*	1.000	
Access to inputs(X <sub>10</sub> )	0.057	-0.109	-0.060	-0.052	-0.045	-0.319	-0.139	-0.126	0.043	1.000

**\*\*P<5%; \* P < 1%; n =153; Source: Survey Results (2016)**

#### 4.5.1.2 Binary logistic regressions analysis

The output of the logistic regression model is presented in Table 4.11. The model was run to assess the relationship between access to the market (dependent variable) and ten predictor variables that is, gender(X<sub>1</sub>), age(X<sub>2</sub>), educational level(X<sub>3</sub>) household income(X<sub>4</sub>), access to credit(X<sub>5</sub>), access to training (X<sub>6</sub>), membership to agricultural organizations (X<sub>7</sub>), access to market support services (X<sub>8</sub>) land size(X<sub>9</sub>) and supply of inputs(X<sub>10</sub>).

**Table 4.11: Parameter estimator of the binary logistic regression model (with market access as dependent variable)**

	B	S.E.	Wald	df	Sig.	Ext(B)
X <sub>1</sub>	0.015	0.394	0.002	1	0.969	1.015
X <sub>2</sub>	0.098	0.349	0.078	1	0.780	0.907
X <sub>3</sub>	0.274	0.215	1.624	1	0.203	1.316
X <sub>4</sub>	0.427	0.492	0.752	1	0.386	1.532
X <sub>5</sub>	0.340	0.642	0.281	1	0.596	1.406
X <sub>6</sub>	0.713	0.430	2.748	1	0.097***	2.040
X <sub>7</sub>	1.462	0.514	8.094	1	0.004*	4.314
X <sub>8</sub>	0.977	0.382	6.538	1	0.011**	2.657
X <sub>9</sub>	-0.206	0.464	0.197	1	0.657	0.814
X <sub>10</sub>	-0.885	0.448	3.914	1	0.048**	0.413
Constant	-1.135	1.375	0.682	1	0.409	0.321

**\*Significant at the 1% level, \*\*Significant at the 5% level; \*\*\*Significant at the 10% level;**

12loglikelihood = 174.72; Cowell and Snell R Square = 0.24; Nagelkerke R Square = 0.282;

Hosmer and Lemeshow Test = 5.10(p=0.74); n=153; dependent variable= access to the market;

Source: Survey results (2016).

Diagnosis of the findings was done through loglikelihood, Wald statistics and the Lemeshow test. According to Field (2005), the loglikelihood is related to the residual sum of squares in multiple regression indicating the extent of unexplained information after fitting the model. Consequently, larger values of the log-likelihood reflect a poorly fitting statistical model but largely improved as independent variables are added into the model. An equivalent statistic for logistic regression is the Wald statistic, because of its special distribution (the chi-square distribution). It reflects whether the b-coefficient of the predictor variables are significantly different from zero, that is, if significantly different, then the predictor is assumed to be making a significant contribution to predicting the outcome (Field, 2005).

Table 4.12 shows that the model correctly predicted most (72.5%) of the cases. The Hosmer and Lemeshow test produced a Chi squared value of 5.10 with a p-value of 0.74 indicating that the model's predicted estimates did not differ significantly from the observed data and thus an indication of an acceptable goodness of fit.

**Table 4.12: Observed versus predicted probabilities for access to markets**

	Observed	Predicted		Percentage Correct
		Access to markets		
		No	Yes	
Access to markets	No	68	15	81.9
	Yes	27	43	61.4
Overall Percentage				72.5

**(Source: survey, 2016, n=153)**

The correlation matrix of variables included in the analysis is presented in Table 4.10 while Table 4.11 shows the Parameter estimator of the binary logistic regression model (with market access as dependent variable). Access to training( $X_6$ ), membership to agricultural organizations( $X_7$ ) and access to market support services( $X_8$ ) had significant positive contribution on the farmers' access to the market. The positive sign of access to trainings, membership to agricultural organisations and access to market implied that access to the market increased with increases in the variables. On the contrary, a negative sign of access to inputs implied that access to credit decreases with an increase in this variable.

As indicated by  $\text{Exp}(\beta)$  values, a value less than 1 would indicate the opposite. Thus as the odds of access to training increase by one unit, that of actual access to the market increases by more than 2 times. A similar explanation pertains to membership to agricultural organisations and access to market support services in which actual access to the market increases by more than 4 and 2 times respectively. However, as the odds of access to inputs increase by 1 unit, there are progressive decreases in the odds for the actual ability to access the market.

The other variables such as age, gender, educational level, land size, access to credit and household income were found insignificant. However, the above variables were not undermined because the results from the regression analysis are the predictions or estimation of the factors that could have affected the actual ability of farmers to access the market. The descriptive results of the above variables were also discussed and compared with the findings of other studies in the discussion part.

## 4.6 Discussion of results

This chapter presented the descriptive and empirical (inferential) analyses carried out to assess factors that assist smallholder farmers to transform from subsistence farming to commercial farming. The results of this study for both descriptive and inferential analyses are discussed and compared with other literature or previous studies both nationally and internationally. These results are discussed separately as follows;

### 4.6.1 Descriptive analysis

Descriptive analysis included the results on the farmers' socio-economic characteristics of smallholder farmers in Mutale Local Municipality, challenges they face and the views of extension officers of the issues hampering smallholder farmers from transforming from subsistence farming to commercial farming.

The findings of this study regarding the dominance of female farmers is appreciated as it is in line with government policy of women empowerment and emancipation (Alunga and wiliam, 2013). The poor participation of youth is however a matter for serious concern. The finding that majority of farmers were elderly is similar to the findings by Nxumalo and Oladele (2013) in Kwazulu Natal Province of South Africa that, the majority of farmers participating in agricultural projects and farming were above 60 years of age. Alam *et al.* (2009) argue that elderly farmers could shun away from adopting new increased productive technologies, especially the use of mechanization, new information collection techniques and physical energy to perform farming activities. A study done by Ajani *et al.* (2015) found that lack of interest to participate in agricultural programmes resulted in higher rate of youth unemployment and high competition for non-agricultural sector jobs.

The relatively high number of farmers with primary school education also warrants attention as this could be impacting their ability to access information, especially that originating from the print and electronic media. In another study in Mpumalanga, Randela *at al.* (2008) argued that intellectual capital is captured by education. They further argued that level of education gives an

indication of the household ability to process information and causes some farmers to have better access to understanding and interpretation than others. High education level is important, as it is likely to lead to the reduction of searching, screening and information costs. Education is not only important in South Africa but also in other African countries. A study conducted in South Western Nigeria found similar results regarding the level of education attained by farmers, that many had attained low level of education (primary level) compared to other educational qualifications (secondary, tertiary and other qualifications) which affected their transformation from smallholder mode of production to commercial farming (Aderemi *et al.*, 2014). Another study in Bangladesh revealed that educated farmers were not only advanced in the adoption processes; but also better-off in terms of applying business techniques than their counterparts (Alam *et al.*, 2009).

A study conducted by Drafor (2014) concluded that regular inflow of income from both farm and off-farm activities increased the probability of being a commercial farmer. It was also shown by Hogos and Geta (2016) that non-farm income was the main backup to farm capital in Ethiopia. Another study conducted in Nigeria revealed that non-farm income was a major contributor to household welfare (Adepeju and Obayelu, 2013). The dominance of low income in this study could be associated with lack of formal employment opportunities and poor participation in formal markets. The revelations of this study regarding the dominance of maize production under dry land conditions could be seen as a major contributor to low income from the farming sector in Mutale Local Municipality that could be compounded by climate change. This results demonstrate need of smallholder commercialisation in Mutale area which will result in increase in their incomes earned from marketing of farm produce and food security of a country. Hendriks and Msaki (2009) argued that smallholder commercialisation will not only improve farmers' income but also has potential to improve food security.

The study findings regarding the dominance of communal land ownership compared to its private and rented counterparts has also been confirmed by Ben-Chendo *et al.* (2014). Lack of ownership to rented or private land tenure systems could impact smallholder commercialisation

in Mutale Local Municipality as allocated communal land parcels were rather too small (mostly less than 5 ha). A study by Thamaga-Chitja and Morojele (2014) found similar results that in South African rural areas, almost all the land is communally owned and administered by Traditional Authorities and it is mainly for subsistence purposes. A study conducted by Seng (2014) also revealed that farm size did not only impact on the amount of output produced but that it also played a role in promoting farm commercialization (Oparinde and Daramola, 2014; Forbord *et al.*, 2014). Another study by Khapayi and Celliers (2015) in Eastern Cape of South Africa found similar results that the majority of farmers were producing on land less than 10ha. This demonstrates that insufficient land availability in South Africa is still a challenge to many farmers including smallholders in Mutale area. Langat *et al.*, (2011) furthered the argument that availability of farming space is a critical element for success in commercial farming.

The findings of this study regarding access to markets revealed that many farmers did not sell their produce, giving the impression that they farm for home consumption. This outcome may be due to the poor harvest and harsh climatic conditions that displace farmers from formal market participation (Arthur and Qaydi, 2010). In a study conducted by Mpandeli and Maponya (2014) in Limpopo it was revealed that many farmers disposed their produce through either local markets or household consumption. In terms of crop production this study confirmed the dominance of non-marketed dry land maize farming, once more purporting a focus on home consumption. The relatively higher formal market participation of farmers under irrigation, more especially as they are able to produce throughout the year was an expected outcome. Osmani and Hossain (2015) noted that non-participation in the formal markets prevented farmers from transiting into commercial farming and poor contribution to economic growth.

Agricultural extension is one of the institutional support services that have critical role to play in transformation of agricultural production (Worku, 2016). An earlier study conducted in Limpopo Province concluded that extension officers were critical in promoting farming efficiency as extension officers were usually conversant with activities of smallholder farming (Aliber and Hart, 2009). Also, many farmers in this study acknowledged the critical role played by extension

officers in the Mutale Local Municipality. According to Adekunle (2014) there is a need for farmers to be in contact with their extension officers at regular intervals. Adekunle (2014) further acknowledged the need for trained extension workers in stimulating agricultural extension programmes. As extension officers in Mutale Local Municipality were aware of several challenges, this could avail strategies and basic foundations for directly focusing on solving farmers' problems towards transformation from smallholder to commercial orientation. The finding regarding the higher proportion of farmers that accessed agricultural extension and information could be regarded as a positive development towards transformation from subsistence to commercial farming. Many farmers pointed to extension workers as their major source of information while few were able to access information through private organization and universities. However, there is need for educating farmers to also be familiar with electronic sources of information. Agricultural extension services are meant to assist farmers to adopt practices that would improve their productivity (Anaglo *et al.*, 2014). Achievement of this ideal requires extension officers that are committed to provide this essential service. Adhiguru *et al.* (2009) confirm the finding regarding the necessity and role of agricultural extension workers in providing the above-mentioned services in addition to dependence on other progressive farmers and agricultural universities.

Access to farm credit was found to be one of the major constraints in Mutale Local Municipality. A similar result was found by Chisasa (2014) in a study conducted in North West and Mpumalanga Provinces, that many farmers were still limited to access credit. The financial policies instruments need to be adjusted to facilitate an effective transition of farmers into commercial orientation. As attested by Mpandeli and Maponya (2014), many farmers on their own find it difficult to access credit despite several credit opportunities being offered by several agencies in South Africa (government and private sector institutions). Some funding institutions that have been identified by Chisasa and Makina (2012) included the Department of Agriculture, Forestry and Fisheries, cooperatives, private individuals, and commercial banks. However, many institutions preferred advancing their funds to low risk commercial farmers. Similarly, the same

study revealed that many farmers seemed to be discouraged by the high transaction costs and other processes involved in accessing credit (long process of application, poor harvest and low income to repay back loans from institutions such as banks). Masuku (2013) further argued that credit access should be supported by the government and other commercial institutions ensuring smallholder commercialisation and productivity. In particular, that study found that access to credit enhanced financial stability, farm business productivity and adherence to commercial farming practices.

Inadequate supply of inputs was still a major concern to many farmers in Mutale Local municipality. Despite the seed and tractors provisions by the government, farmers were still limited to number of inputs, for example fertilisers and chemicals. According to Olaoye (2014) many farmers in developing countries – Nigeria included – were characterised by inefficient input supply and distribution systems in addition to dependency on ineffective inputs application and outdated technologies. Mpandeli and Maponya (2014) have highlighted that smallholder farmers in rural areas of Limpopo were negatively affected by inadequate inputs.

This study also revealed lack of training to more than half of respondents despite extensive dependence on extension officers as training agents. Extra effort at bringing in other training stakeholders becomes imperative, especially that emanating from private sector institutions. Salami *et al.* (2010) support the need for training especially as a strategy to enhance and encourage technology adoption and innovation. Training is considered as one of the processes that farmers could use to acquire skills and attitude shift (Sajeev *et al.*, 2012). Training should focus on crop production, plant protection, soil health and fertility management, production inputs and agricultural engineering. A Kenyan study by Mulu-Mutuku *et al.* (2013) contradicted the finding of this study regarding lack of training especially in that almost all farmers received the necessary training from both public and private institutions.

Another critical finding of this study was non- membership to agricultural organizations. This result was similar with the finding by Hosu *et al.* (2016) in Eastern Cape, South Africa that more

than half (51%) of farmers were non-member to agricultural organisation. The study observed that the cost of membership ranked highest among the reasons why farmers did not join any farmers' organisations. This result is in contrast with the findings by Aderemi *et al.* (2014) that many farmers in South Western Nigeria had membership to farmer organizations in line with Asogwa and Okwoche (2012) who regarded membership to agricultural organizations as a critical success factor towards formal market participation. In support of the above Jari *et al.* (2013) found that membership to agricultural cooperatives opened up opportunities for participation in both local and international markets.

The finding regarding lack of smallholder farmer support to access markets does not bode well for sustaining smallholder farming in Mutale Local Municipality, especially in that poor infrastructure hinders the hauling of produce from the farm to relevant markets. In retrospect traders and consumers of farm produce are also affected due to difficulties in accessing produce centres. Bahta and Bauer (2012) found that road infrastructure was critical in enhancing smallholder commercialization. Adekunle (2014) attested to the role of storage facilities, especially in their ability to maintain farm produce quality.

Major challenges facing farmers in Mutale Local Municipality revolved around the shortage of water, poor mechanization and infrastructure. A study by Hitayez *et al.* (2014) found similar results for farmers practicing dry land farming in environments that were characterized by shortage of water that discouraged crop diversification. A study by Fanadzo *et al.* (2010) further argued that crop diversification is the major mitigating factor in reducing the negative effects of drought for smallholder farming. The critical role of mechanized farming was also noted by Sims and Kienzle, (2016). However, acquiring mechanized assets such as tractors could result in diseconomies of scale for individual smallholder farmers. Consequently, group acquisition of such equipment could both enhance their productivity and speed of transformation towards commercialization. Another challenge that was in line with an earlier study by Agwu *et al.* (2012) was long distance to markets. These are critical factors that have significant impact on commercialization. In this study, many extension officers considered land ownership, finance,

and climate change, age of farmers, mechanisation and supportive infrastructures as major stumbling blocks to farming efficiency.

The finding that the majority of extension officers saw land ownership as a major stumbling block to farming activities confirms disparities in land occupation especially against black South Africans. As noted much earlier, during the earlier years of democracy in South Africa, communal areas were initiated to serve as reservoirs for cheap migratory labour rather than as units that could support agricultural production activities (*Adam et al.*, 1999). As operational units that are in constant contact with farmers on the ground, the views held by extension officers regarding extensive availability of produce markets point out to other challenges that could include lack of farmer productive capacity. *Simon et al.* (2015) suggested collective marketing as a solution to increased market participation for smallholder farming. Critical challenges that have been identified by extension workers in this study, including lack of financial support, climate change and the aging farmers warrant immediate attention. Some of the views of the extension officers were similar to the survey findings from farmers, for example lack of finance, infrastructures and mechanizations were all found by both surveys.

#### **4.6.2 Inferential analysis**

Binary econometric modelling results revealed that although market access by smallholder farmers was affected by many factors, only a few variables had significant impact, i.e. access to training, membership to agricultural organizations, access to market support services and access to supply of inputs. Three of the above significant variables impacted positively on market access i.e. access to training, membership to agricultural organizations and access to market support services. A study by *Osmani and Hossain* (2015) in Bangladesh identified market support services (infrastructures) inclusive of institutional and technical dimensions as critical factors for market access. A study by *Khapayi and Celliers* (2015) in South Africa support the finding of this study that market support services remain one of the major important interventions in the agricultural sectors for rural commercialisations, food security, poverty alleviation and income

generation. Market support services included the provision of physical infrastructures, information and transportation services that would allow farmers to access a point of sale of their produce. Farmers with such support services were more likely to access the market. Another study by Tolno *et al.* (2015) and Magesa *et al.* (2014), identified farmer associations as critical factors in accessing the market. A study by Sikwela and Mushunje (2013) in Eastern Cape and KwaZulu Natal Provinces of South Africa found a similar result that membership to agricultural organisations has significant impact on the degree of market access that is, farmers in cooperatives were having better access to markets. Membership to agricultural organisations also increases a better chance to access trainings which was also found to be significant to better access to the market by farmers in Mutale area. The results that there was a negative relationship between supply of inputs adequately and market access was unexpected. The inverse of this relationship implies that farmers with relatively supply of inputs adequately are likely to have low level of participation in markets. This is probably an indication that increased market participation is a function of supply of inputs (Leykun and Jemma, 2014).

#### **4.7 Chapter summary**

This chapter presented the descriptive and empirical (inferential) analyses carried out to assess factors that would assist smallholder farmers to transform from subsistence farming to commercial farming. These results are summarised separately as follows;

##### **4.6.1 Descriptive analysis**

The descriptive analysis included farmer socio-economic characteristics, challenges faced and the views of extension officers regarding the factors hampering smallholder from transformation. Farmers in Mutale Local Municipality spread within three farming systems which were irrigation, dry land for maize and citrus fruit farming systems. The study revealed that many farmers were female. There was lower participation of youth compared to the aged and elderly farmers. Most of them had primary level education. It was also revealed that many farmers were characterised by low monthly income earning ranging between R100-R5 000 mainly emanating from social

grants. Many farmers did not have access to credit, market, trainings, adequate supply of inputs such as fertilisers, seeds and implements, and to agricultural organisations such as cooperatives. Several challenges faced by farmers included the shortage of water, low mechanisation, physical infrastructures, access to and distance to market, which impeded on their transformation processes.

#### **4.6.2 Inferential results**

The Binary logistic model was used to predict factors that would assist farmers' ability to access market to transform from subsistence farming to commercial farming. Market access by smallholders was affected by many factors; however, four variables had significant impact that was access to training, membership to agricultural organisations, access to market support services and access to supply of inputs. Three of the above significant variables impacted positively market access, i.e. access to training, membership to agricultural organisations, and access to market support services.

## CHAPTER 5

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

The aim of the study was to assess the factors that would assist smallholder farmers to a commercial mode of production in Mutale Local Municipality. The specific objectives of the study were to assess the farmers' socio-economic characteristics that would contribute to the transformation process, investigate challenges that farmers were facing in their daily farming activities and to discern the views of extension officers regarding issues that hamper subsistence farmers from the transformation processes. Therefore, this chapter provides the study summary, conclusions and recommendations on the main findings of the study. It summarises and briefly discusses the results with respect to the descriptive and inferential statistical analysis. It further gives suggestions on future research opportunities.

#### 5.2 Summary

The summary of the study is based on both descriptive and inferential analyses carried out to assess the factors that would assist smallholder farmers to transform from subsistence to commercial farming.

##### 5.2.1 Descriptive analysis

The descriptive results provided the information related to farmers' socio-economic characteristics that would assist them to transform from subsistence farming to commercial farming, challenges they face in their farms and the extension officers' views regarding the issues that hamper them from transforming from subsistence farming to commercial farming. Smallholder farmers in Mutale were categorised into three farming systems; with many of the sampled households under dry land farming with maize, followed by farmers under irrigation while the rest were under citrus fruit production system. The results show that the majority were females than males. There was low participation of youth in farming compared to other group

age farmers with only few youth while more were elderly and middle-aged range group. The educational levels of farmers were very low with many farmers only having attended primary school while few had no education. These findings regarding lack of youth and high educational background could impede commercialisation of smallholder agriculture in Mutale area because low-educated and old-age group farmers could be limited to only scant information required for intensive production and marketing environment. In this regard, they may fail to access information from electronic sources such as the internet and journals.

The finding regarding household income shows that many farmers were characterised by low monthly income earning ranging between R100-R5 000 mainly emanating from social grants. Most of the low income earners were operating in dry land farming, with many of them lacking access to the market. This could be the implications of drought conditions that could affect their production activities. This will result in low progression from subsistence farming to commercial farming and result in food insecurity. It was also uncovered that, many farmers depended on very small communal land occupation, i.e. less than 5 hectares of land. The lack of sufficient land could possibly lead to failure of crop diversification and increase in income which will also result in poor food security to the members of the society who benefited from their farm produce.

Several challenges were identified by smallholder farmers in the Mutale area and were also emphasised by the extension officers within the Municipality. The majority of farmers pointed to inadequacy of inputs supply as a major impediment to their farming activities. Many farmers also ranked shortage of water as another constraint which affects the development and yield of their farming produce. This could be one of the negative impacts to the participation of many farmers in the market, that is, many of them produce for their home consumption. Low mechanisation was one of the critical challenges ranked high by many farmers, i.e. the lack of farming equipment such as tractors and implements such as disc ploughs, ridges, and motors for water pumping. More than half of farmers identified physical infrastructure such as storage facilities, irrigation and quality roads. Distances to markets was also one of the challenges that impeded on their commercialization. The extension officers within the Mutale area also emphasised

certain challenges that farmers were facing in their daily farming activities. The majority of extension officers saw land ownership as a major stumbling block to farming activities. Other critical challenges related to lack of financial support, climate change and the aging farming sector.

### **5.2.2 Inferential analysis**

Regarding the inferential analysis, the Binary logistic regression model was used to predict factors that could influence farmers' ability to access markets for their farm produce. In this study, access to markets was the main determinant of smallholder commercialisation. The Binary logistic regression model revealed that ability to access markets by smallholder farmers in Mutale Local Municipality could be influenced by some socio-economic variables. The statistical significant variables were access to trainings by farmers, membership to agricultural organisations, access to market support service such as transport services, storage facilities and other physical infrastructures, and access to supply of inputs such as fertilisers and seeds. From the four significant variables, three were impacting ability to access market positively, i.e. the increase in trainings by farmers, membership to agricultural organisations and access to market support services, all these increase the chances of farmers to access market. The more farmers access the markets is the more farmers transform from subsistence farming to commercial farming.

### **5.3 Conclusion**

The conclusion of the study is based on the hypothesis that was set by the research. That is farmers' socio-economic characteristics do no assist farmers to transform from subsistence farming to commercial farming. Based on the results of the inferential analysis, some socio-economic characteristics were tested for their significance to influence the ability of farmers to access the market. The following were the tested significant variables; access to trainings by farmers, membership to agricultural organisations, access to market support services and adequate supply of inputs. Therefore, the stated hypothesis is rejected. It can be then concluded

that socio-economic characteristics such as trainings received by farmers, membership to agricultural organisation, access to market support services and supply of inputs are some of the key elements to assist smallholder farmers to transform from subsistence farming to commercial farming. Therefore, if this variable were taken into consideration in Mutale area, smallholder commercialisation process would have been enhanced, i.e. the shift from full subsistence to emerging farming to fully commercialised agriculture. Smallholder commercialisation will add value on the reduction of poverty by improving farmers' income and contribute to food security. It is fortunate that the current government of South Africa is showing a determined drive towards smallholder commercialisation using different policy instruments such as land reform programme (LRP), Black Economic Empowerment in Agriculture (AgriBEE), Comprehensive Agricultural Support Programme (CASP), and other organisations such as Oxfam, SEDA, IDC, and service providers such as MAFISA and Ilima. If farmers of Mutale Local Municipality become aware of all these programmes, they could develop their smallholder sector which will play a significant role in economic development by enhancing food security, poverty reduction and job creation through commercialising their farming produce. All the above programmes need to be strengthened to support smallholder farmers in Mutale area to ensure effective progression of smallholder sector to commercial agricultural sector.

The following challenges still need special attention; shortage of water, low mechanization, low input access, access to credit, lack of ownership to land, infrastructures, and distance to and from markets. In the literature such challenges were found in many studies in South Africa and in other African countries as well. Extension officers also viewed land ownership as a major stumbling block to farming activities that was compounded by continued support for communal land occupation (attested by literature as having been initiated as reservoirs for cheap labour). The negative impact of climate change that was accompanied by lack of financial support for production input acquisition could have been seen by extension officers as one of the critical challenges facing smallholder agriculture. The above views do not bode well for transforming subsistence to commercial farming. There were similarity views by both farmers and extension

officers that low mechanisation and support infrastructures do not bode well for transforming subsistence farming to commercial farming.

#### **5.4 Recommendations**

The finding that most farmers were females is highly appreciated and commended, especially in that the policy of women empowerment has been achieved by the farming sector in Mutale Local Municipality. It is a matter of concern though that the participation of youth in farming activities within the local municipality is low. Strategies to increase youth participation need to be devised both by the private sector and public institutions if commercialization of farming units is to be achieved. Such strategies could include providing incentives such as start-up credit to potential youth farmers and training of youth in farm business management and production skills. The support of youth in farming will also be the best strategy in reducing unemployment in the whole country. This will also help the country ensuring quality production which will contribute to high food security in the country because youth with education will be able to access different production information techniques compared to elders. Initiatives such as NYDA and MAFISA should be strengthened to be more effective in servicing youth projects in agriculture.

The revelation in this study that most farmers depend mostly on social grants should be considered as a matter for concern needing immediate intervention by both governmental and non-governmental sector institutions. Interventions could include provision of funding to potential farmers and training on how to apply for funding that is resident in many financial institutions such as commercial banks and non-governmental funding agencies. The latter could provide solutions related to credit access by farmers. In the present era of climate change farmers' dependence on non-farm income generating activities also need to be promoted in the quest to transform them into effective commercial units.

Poor educational achievement and lack of training are critical findings that need to be addressed. There is a need for external agencies such as the government and the private sector to aim resources towards basic education and training provision. Institutions of higher learning –

especially their agricultural faculties – could also play significant roles in this regard. With the initiation of Agriparks nationally – meant to enhance and promote increased production and up-scaling of farmers towards commercial orientation – farmer training will be quite critical in farmer enhancement.

The finding that many farmers were not members of any agricultural organisations also needs attention. Different organisations such as cooperatives or farmers associations, group farming schemes and respective industries as per their produce could play a role in disseminating information and improving their access to markets. There is a need of awareness workshops to give exposure to farmers on the benefits of membership to agricultural organisations or industry related groups.

The similarity views held by farmers and extension officers regarding low mechanisation and lack of supportive infrastructures also warrant attention. Extension officers ascribe the challenge on other factors that include the communal land tenure system. In the final analysis, the effects of climate change cannot be underestimated in affecting farmer production levels. An overriding solution to this challenge could be facing the impact of climate change heads-on – an observation that requires clear exposure of this scourge to both farmers and extension officers, especially practising crop diversification and a focus on those crops that could withstand harsh climatic conditions. The resultant increased productivity could encourage and promote transformation to commercialization.

## **5.5 Suggestions for future research**

The following issues require further investigation:

- Unlike in the past there are presently more youths that enrol for various agricultural science programmes at institutions of higher learning. The challenge though is that many prefer government and private sector employment rather than initiating their own farming enterprises. Research on challenges and strategies that could be employed to promote entrepreneurship amongst young agriculture graduates needs to be conducted.

- In addition, the government has embarked on an ambitious innovation initiative – the Agriparks concept – that seeks to network agro-processing, marketing, training etc. targeting farmers within specific commodity groups in various districts of South Africa. The impact of this initiative also needs to be assessed especially its impact on future smallholder commercialization.

## 6 REFERENCES

- Abdu-Raheem, K.A., 2014. Exploring the Role of Agricultural Extension in Promoting Biodiversity Conservation in KwaZulu-Natal Province, South Africa. *Agroecology and Sustainable Food Systems*, 38(9), 1015-1032.
- Adam, M., Cousins, B. and Monama S., 1999. Land tenure and economic development in rural South Africa: Contrasts and opportunities. Working paper 125, Overseas Development Institute, London, UK.
- Adekunle, O.O., 2014. An investigation of challenges facing home gardening farmers in South Africa: A case study of three villages in Nkokonbe Municipality Eastern Cape Province. *Journal of Agricultural Science*, 6(1), pp.102-109.
- Adeniyi, O.R., 2013. Socio-economic analysis of smallholder farming practices in South-Western Nigeria, Canadian Centre of Science and Education. *Sustainable Agriculture Research*, 2(1), pp. 104-111.
- Adepoju, A.O. and Obayelu, O., 2013. Livelihood diversification and welfare of rural households in Ondo State, Nigeria. *Journal of Development and Agricultural Economic*, 5(12), pp. 482-489.
- Aderemi, E.O., Omonona, B.T., Yusuf, S.A. and Oni, O. A., 2014. Determinants of output commercialization among crop farming households in South Western Nigeria. *American Journal of Food Science and Nutrition Research*, 1(4), pp.23-27.
- Adhiguru, P., BIRTHAL, P.S. and Kumar, B.G., 2009. Strengthening pluralistic agricultural information delivery system in India. *Agricultural Economic Research Review*, 22, pp.71-79.
- Agresti, A. and Finlay, B., 2008. Statistical options for the Social Sciences, 4<sup>th</sup> edition. Available at <http://betterevaluation.org/evaluation-options/multistage>. Accessed 04 November 2015.

AgriSETA., 2010. Sector analysis agriculture, Department of Higher Education and Training. Available at [http://www.agriseta.co.za/downloads/news/AGRISETA\\_Sector\\_Analysis\\_290610\\_version\\_2.pdf](http://www.agriseta.co.za/downloads/news/AGRISETA_Sector_Analysis_290610_version_2.pdf). Accessed 27 April 2015.

Agwu, N.M., Anyamwu, C.I. and Mendie, E.I., 2012. Socio-economic determinants of commercialization among smallholder farmers in Abia State, Nigeria. *Journal of Agricultural Sciences*, 2(8), pp.392-397.

Ajani, E.N., Mgbenka, R.N. and Onah, O., 2015. Empowerment of youths in rural Areas through agricultural development programmes: Implications for poverty reduction in Nigeria. *International Journal of Research in Agriculture and Forestry*, 2(2), pp.34-41.

Akuduku, M.A., Guo, E. and Dadzie, S.K., 2012. Adoption of modern agricultural production technologies by farm households in Ghana: What factors influence their decisions? *Journal of Biology, Agriculture and Healthcare*, 2(3), pp.1-13.

Alam, G.M., Hoque, K.E., Khalifa, T. B., Siraj, S.B., and Ghani, M.F.B. A., 2009. The role of agriculture education and training on agriculture economics and national development of Bangladesh. *African Journal of Agricultural Research*, 4(12), pp.1334-1350.

Allen, I.E. and Seaman, C.A., 2007. Likert scales and data analysis: Quality progress. Available at [www.qualityprogress.com](http://www.qualityprogress.com). Accessed 26 May 2015.

Aliber, M. and Hart, T.G.B., 2009. Should smallholder agriculture be supported as a strategy to address rural food security? *Agrekon*, 48(4), pp.434-458.

Alunga, J.U. and William, M.J., 2013. Gender roles and agribusiness in the Kenyan communities: The case of Likuyani District. *Journal of Emerging Trends in Educational Research and Policy Studies*, 4(5), pp.733-738.

Anaglo, J.N., Boateng, S.D. and Boateng C.A., 2014. Gender and access to agricultural resource by smallholder farmers in the upper West Region of Ghana. *Journal of Education and Practice*, 5(5), pp.13-19.

Arslan, A., McCarthy, N., Lipper, L., Asfaw, S. and Cattaneo. 2014. Adoption and intensity of adoption of conservation farming practices in Zambia. *Agriculture, Ecosystems and Environment*, 187, pp.72-86.

Arthur, R.M. And Did, S. A., 2010. Agricultural marketing in the western region of Abu Dhabi, United Arab Emirates: attitudes and perceptions. *Agriculture and Biology Journal of North America*, 1(4), pp.458-468.

Adowa, B.C. and Okwoche, V. A., 2012. Marketing of agricultural produce among rural farm households in Nigeria: The case of sorghum marketing in Benue State. *International Journal of Business and Social Science*, 3(13), pp.269-277.

Averbeke, W.V., 2008. Best management practices for small-scale smallholder farming on selected irrigation schemes and surrounding areas through participatory adaptive research in Limpopo Province. WRC Report No TT 344/08.

Averbeke, W.V. and Mohamed, S.S., 2006. Smallholder farming styles and development policy in South Africa: The case of Dzindi irrigation scheme. *Agrekon*, 45(2), pp.136-157.

Bahta, S. And Bauer, S., 2012. Policy options for improving market participation and sales of smallholder crop producers: A case study of Free State Province of South Africa. *African Journal of Agricultural Research*. 7(24), pp.3525-3533.

Ben-Shendo, G.N., Kory, O.C., Essen, U.A. and Uhuegbulem, I.J., 2014. Determinants of land holding size among rice farmers in Southeast, Nigeria. *Asian Review of Environmental and Earth Sciences*, 1(3), pp.56-60.

Benoit, K., 2010. MSc module 6; Introduction to Quantity Research Methods. Available at [www.kenbenoit.net/.../IQRM-Week9-](http://www.kenbenoit.net/.../IQRM-Week9-). Accessed 23 February 2016.

Betek, C.K. and Jumbam, N.D., 2015. Small scale vegetable production: a case study of Port St Johns, Eastern Cape Province, South Africa. *Transactions of the Royal Society of South Africa*, 70(1), pp.41-45.

Black, A., Conradie, B. and Gerwel, H., 2014. Should agriculture receive greater support as part of an inclusive growth strategy? Available at <http://www.econ3x3.org/sites/default/files/articles/Black%20et%20al%202014%20Agriculture%20support%20-%20FINAL2.pdf>. Accessed 11 June 2015.

Botlhoko, G.J. and Oladel, O.I., 2013. Factors affecting farmer's participation in agricultural projects in Ngaka Modiri Molema District North West Province in South Africa. *J Hum Eco*, 41(3), pp.201-206.

Braun, V. and Clarke, V., 2006. Using thematic analysis in psychology. *Qualitative research in psychology*. Available at <http://eprints.uwe.ac.uk/11735>. Accessed on 15 November 2015.

Brits, M., 2014. From smallholder to commercial farming. International Federation of Agricultural Journalists (IFAJ) and the Dutch development company, Agriterra. Available at [http://www.ifaj.org/fileadmin/user\\_upload/Professional\\_Development/Media\\_Tour\\_2013/SA\\_Mariken\\_1.pdf](http://www.ifaj.org/fileadmin/user_upload/Professional_Development/Media_Tour_2013/SA_Mariken_1.pdf). Accessed 24 May 2015.

Chamberlin, J., 2007. Defining smallholder agriculture in Ghana: Who are smallholders, what do they do and how are they linked with markets? Ghana strategy support program. Background Paper No. GSSP 0006, International Food Policy Research Institute. Available at <http://www.ifpri.org/sites/default/files/publications/ifpridp00823.pdf>. Accessed 10 May 2015.

Chauke K. P., 2016. Policy and institutional arrangements for managing risk for crop production and post harvest handling in climate disaster-prone areas of South Africa. Available at <http://www.fanrpan.org/documents/d01980/07%20%20South%20Africa%20Policy%20brief.%20April%202016.pdf>. Accessed 18 April 2017.

Chisasa, J., 2014. A diagnosis of rural agricultural credit markets in South Africa: empirical evidence from North West and Mpumalanga provinces. *Banks and Bank Systems*, 9(2), pp.100-111.

Chisasa, J. and Makhina, D., 2012. Trends in credit to smallholder farmers in South Africa. *International Business and Economics Research Journal*, 11(7), pp.771-784.

Chirwa, E.W. and Matita, M., 2012. From subsistence to smallholder commercial farming in Malawi: A case of NASFAM commercialisation initiatives. Working paper 037. Available at <http://www.future-agricultures.org/publications/research-and-analysis/1566-from-subsistence-to-smallholder-commercial-farming-in-malawi-a-case-of-nasfam-commercialisation/file>. Accessed 25 January 2016.

Collier, P. and Dercorn, S., 2014. African agriculture in 50 years: Smallholder in a rapidly changing world? *World Development*. 63, pp.92-101.

Cousins, B., 2010. What is a 'smallholder'? PLAAS, University of the Western Cape, Working Paper, 16.

Creswell, J.W., 2003. Research design: Qualitative, quantitative, and mixed method approaches. Available at [http://ucalgary.ca/paed/files/paed/2003\\_creswell\\_a-framework-for-design.pdf](http://ucalgary.ca/paed/files/paed/2003_creswell_a-framework-for-design.pdf). Accessed 25 January 2016.

Creswell, J. and Plano Clark, V., 2011. Designing and conducting mixed methods research. Available at <http://core.ecu.edu/ofe/statisticsresearch/mixed%20methods%20new.pdf>. Accessed 25 June 2016.

- DAFF., 2013. Strategic plan for smallholder support. Available at <http://www.nda.agric.za/doaDev/sideMenu/SmallHolder/docs/Strategic%20Plan%20for%20Smallholder%20Support.pdf>. Accessed 04 December 2016.
- DAFF., 2014. Agricultural policy action plan. Available at <http://www.agrisa.co.za/wp-content/uploads/2014/10/011-APAP-AgriSA.pdf>. Accessed 02 December 2016.
- Davidova, S., Fredrikson, L. and Bailey, A., 2009. Smallholder and semi-smallholder farming in selected EU new member state. *School of Economics discussion papers*, 09(20), pp.1-23.
- Diale, N.R., 2011. Socio-economic indicators influencing the adoption of hybrid sorghum: The Sekhukhune District Perspective. *J Agric Ext*, 39, pp.75-85.
- Drafor, I., 2014. Gender and small-farmer commercialization: A case of two farming communities in Ghana. *Journal of Development and Agricultural Economics*, 6(4), pp.184-192.
- FAO., 2014. Understanding smallholder farmer attitudes to commercialization: The case of maize in Kenya. Rome. Available at <http://www.fao.org/3/a-i3717e.pdf>. Accessed 24 May 2015.
- Fanadzo, M., Chiduzo, C.C. and Mnkeni, P.N.S., 2010. Overview of smallholder irrigation schemes in South Africa: Relationship between farmer crop management practices and performance. *African Journal of Agricultural Research*, 5(25), pp.3514-3523.
- Field, A., 2005. *Discovering statistics using SPSS (2<sup>nd</sup> Ed.)*. London; Sage.
- Forbord, M., Bjorkhaug, H. and Burton, R.J.F., 2014. Drivers of change in Norwegian agricultural land control and the emergence of rental farming. *Journal of Rural Studies*, 33, pp.9-19.
- Gebre-Ab, N., 2006. Commercialization of smallholder agriculture in Ethiopia. Available at N Gebre-ab - Note and Papers Series, 2006 - [policydialogue.org](http://policydialogue.org). Accessed 12 July 2015.
- Green, J.L., Camilli, G. and Elmore, P.B., 2006. *Handbook of complementary methods in education research*, Washington, D.C. American Educational Research Association.

Greene, W.H., 2003. Econometric analysis. Available at [www.pearsonhihered.com](http://www.pearsonhihered.com). Accessed 17 August 2015.

Hailua, G., Manjure, K. and Aymutic, K., 2015. Crop commercialization and smallholder farmers' livelihood in Tigray region, Ethiopia. *Journal of Development and Agricultural Economic*, 7(9), pp. 314-322.

Harrell, F.E., 2001. Regression modelling strategies with applications to linear models, logistic regression and survival analysis. Springer-Verlag, New York.

Hendriks, S.L. and Msaki, M.M., 2009. The impact of smallholder commercialisation of organic crops on food consumption patterns, dietary diversity and consumption elasticities. *Agrekon*, 48(2), pp. 184-189.

Hitayezu, P., Zegeye, E.W. and Ortmann, G.F., 2014. Some aspects of agricultural vulnerability to climate change in the KwaZulu-Natal Midlands, South Africa: A systematic review. *Journal of Human Ecology*, 48(3), pp.347-356.

Hogos, A. and Geta, E., 2016. Review on smallholder's agriculture commercialization in Ethiopia: What are the driving factors to focus on? *Journal of Development and Agricultural Economics*, 8(4), pp. 65-76.

Hosu, S.Y., Cash, E.N. and Swazi, P.N., 2016. Vulnerability to climate change in the Eastern Cape province of South Africa: what does the future holds for smallholder crop farmers? *Agrekon*, 55(1&2), pp.133-167.

Houlton, C., Tyler, G., Hazel, P., Forward, A., Kidd, J. And Stockbridge, M., 2008. All-Africa review of experiences with commercial agriculture: Lessons from success and failure. Available at [http://siteresources.worldbank.org/INTAFRICA/Resources/2579941215457178567/CCAA\\_Success\\_failure](http://siteresources.worldbank.org/INTAFRICA/Resources/2579941215457178567/CCAA_Success_failure). Accessed 25 May 2015.

Isaak, O., 2009. A case study of changing livelihood strategies of the community of Brannon so-e village, Nacho Ratchanisma Province, Thailand. *European journal of development research*, 21, pp.250-263.

Jaleta, M., Gebremedhin, B., and Hoekstra, D. 2009. Improving productivity and market success of Ethiopian farmers improving market opportunities. Available at <https://www.microlinks.org/sites/microlinks/files/resource/files/ILRI%20%20Smallholder%20Commercialization%20Processes.pdf>. Accessed 05 December 2016.

Jari, B. and Fraser., 2014. An analysis of institutional and technical factors influencing agricultural marketing amongst smallholder farmers in the Kat River Valley, Eastern Cape Province, South Africa. *International Journal of Agricultural Marketin*,1(1), pp. 2-9.

Jari, B., Snowball, J.D. and Fraser, G.C.G., 2013. Is fair trade in commercial farms justifiable? Its impact on commercial and small-scale producers in South Africa. *Agrekon*, 52(4), pp. 66–88.

Kadapatti, R.G. and Bagalkoti, S.T., 2014. Small farms and agricultural productivity- A macro analysis. *International Journal of Social Science Studies*, 2(3), pp.123-135.

Kgosiemang, D.T. and Oladele, O.L., 2012. Factors affecting farmers' participation in agricultural projects in Mkhondo Municipality of Mpumalanga Province, South Africa. *J Hum Ecol*, 37(1), pp.19-27.

Khapayi, M. and Celliers, P.R., 2015. Issues and constraints for emerging farmers in the Eastern Cape Province, South Africa. *African Journal of Agricultural Research*. 10(41), pp. 3860-3869.

Kirui, O.K and Njiraini, G. W., 2013. Determinants of agricultural commercialization among the rural poor: Role of ICT and collective action initiatives and gender perspective in Kenya. Available at [ageconsearch.umn.edu/.../Oliver%20K](http://ageconsearch.umn.edu/.../Oliver%20K). Accessed 8 July 2015.

Kong, T.M., Austin, D.E., Kellner, K. and Orr, B.J., 2014. The interplay of knowledge, attitude and practice of livestock farmers land management against desertification in the South African Kalahari. *Journal of arid Environments*, 105, pp.12-21.

Kostov, P. and Lingard, J., 2002. Smallholder agriculture in transition economies: its roles and determinants. Available at <http://core.ac.uk/download/pdf/9309562.pdf>. Accessed 5 March 2015.

Langat, B.K., Ngéno, V.K., Sulo, T.K., Nyangweso, P.M., Korir, M. K., Kipsat, M. J. and Kebenei, J. S., 2011. Household food security in a commercialized smallholder economy: A case of smallholder tea farmers in Nandi south district, Kenya. *Journal of Development and Agricultural Economics*, 3(5), pp.201-209.

Laven, A. and Pyburn, R., 2015. Facilitating gender inclusive agri-business. *Knowledge Management for Development Journal*, 11(1), pp.10-30.

Leahy, T. and Goforth, M., 2014. Best practice for rural food security projects in Southern Africa? *Development in Practice*, 24(8), pp.933-947.

Lekgau, S. and Jooste, A., 2012. Potato case study of a successful black farmer fuelled by potato passion, South Africa. Available at <http://www.namc.co.za/upload/all%20reports/POTATO%20CASE%20BOOKLET%202012.pdf>. Accessed 10 December 2016.

Leykun, B.D. and Jemma, H., 2014 Econometric analysis of factors affecting market participation of smallholder farming in Central Ethiopia. *Journal of Agricultural Economics, Extension and Rural Development*. 2(6), 94-104.

Lipton, M., 2013. Staples production: efficient "smallholder" smallholders are key to poverty reduction, development, and trade, Sussex University. Brighton, England. Available at [http://unctad.org/meetings/en/Presentation/SUC\\_GCF2013\\_18-03-2013\\_Michael-LIPTON\\_Study.pdf](http://unctad.org/meetings/en/Presentation/SUC_GCF2013_18-03-2013_Michael-LIPTON_Study.pdf). Accessed 6 March 2015.

Liverpool-Tasie, L.S., Kuku, O. and Ajibola, A., 2011. A review of literature on agricultural productivity, social capital and food security in Nigeria. International policy Research Institute, NSSSP Working paper 21.

Local government., 2015. Description of Mutale Local Municipality. Available at [http://www.localgovernment.co.za/provinces/view/5/limpopo\(2015\)](http://www.localgovernment.co.za/provinces/view/5/limpopo(2015)). Accessed on 19 may 2015.

Magesa, M.M., Michael, K. and Jesuk, K., 2014. Access to Agricultural Market Information by Rural Farmers in Tanzania. *International Journal of Information and Communication Technology Research*, 4(7), pp.264-273.

Magoro, M.D. and Hlungwani, S.S., 2014. The role of agricultural extension in the 21 century: reflections from Africa. *International Journal of Agricultural Extension*, 2(1), pp.89-93.

Mahaliyanaarachchi, P., Wijeratne, A.W. and Bandara, R.M.A.S., 2006. Developing an attitudinal scale to measure the attitudes of the farmers towards commercialization of Agricultural Extension. *The Journal of Agricultural Sciences*, 2(3), pp.26-35.

Martey, E.M., Al.Hassan, R.M. and Kuwornu, J.K.M., 2012. Commercialization of smallholder agriculture in Ghana: A tobit regression analysis. *African Journal of Agricultural Research*, (14), pp.2131-2141.

Masters, W.A., Djurfeldt, A.A., De Haan, C., Hazell, T.J., Jirstrom, M. and Reardon, T., 2013. Urbanization and farm size in Asia and Africa: Implications for food security and agricultural research. *Global Food Security*, 2, pp.156-165.

Masuku, M.B., 2013. Factors affecting the productivity and profitability of vegetables production in Swaziland. *Journal of Agricultural Studies*, 1 (2), pp.37-52.

Matsane, S.H. and Oyekale, A.S., 2014. Factors affecting marketing of vegetables among small-scale farmers in Mahikeng Local Municipality, North West Province, South Africa. *Mediterranean Journal of Social Sciences*, 5(20), pp.390-397.

Mingxuan, P.L., Donaldson, J.A. and Zhang, Q.F., 2011. The transformation of China's agriculture system and its impact on Southeast Asia. *International Journal of China Studies*, 2(2), pp.289-310.

Mitiku, A. and Bely, B., 2014. Smallholder farmers agricultural commercialization and rural poverty in major coffee growing of South Western Ethiopia. *Journal of Science* (4)4, p. 242-249.

Mnkeni, P. and Mutengwa c., 2013. A comprehensive scoping and assessment study of climate smart agriculture policies in South Africa. Available at [http://www.fanrpan.org/documents/d01761/South%20Africa\\_Comprehensive\\_Scoping\\_Assessment\\_of\\_CSA\\_Policies.pdf](http://www.fanrpan.org/documents/d01761/South%20Africa_Comprehensive_Scoping_Assessment_of_CSA_Policies.pdf). Accessed 18 April 2017.

Moyo, C.S., 2013. Rural woman and land, the inseparable twins: A case of South Africa. Ife Center for Psychological Studies/Services, Ile-Ife, Nigeria. *Gender and Behaviour*, 11(2), pp.5393-5401.

Mpandeli, S. and Maponya P., 2014. Constraints and Challenges Facing the Small Scale Farmers in Limpopo Province, South Africa. *Journal of Agricultural Science*, 6(4), pp.135-143.

Mulu-Mutuku, M.W., Wanga, D.A.O., Ali-Olubandwa, A.M., Maling'a, J. and Nyakeyo.A., 2013. Commercialisation of traditional crops: are cassava production and utilisation promotion efforts bearing fruit in Kenya? *Journal of Sustainable Development*, 6(7), pp.48-58

Muzari, W., Gatsi, W. and Muvhunzi, S., 2012. The impacts of technology adoption on smallholder agricultural productivity in Sub-Saharan Africa: A review. *Journal of Sustainable Development*, 5(8), pp.69-77.

NAMC, 2015. Status report on agricultural industry trusts. Available at [www.namc.co.za/upload/NAMC---Status-Report---Agricultural-Industry-Trusts---V2.pdf](http://www.namc.co.za/upload/NAMC---Status-Report---Agricultural-Industry-Trusts---V2.pdf). Accessed 17 December 2016.

Ngqangweni, S., Mmbengwa, V., Myeki, L., Sotsha, K. and Khoza, T., 2016. Measuring and tracking market access in South Africa. NAMC working paper. Available at <http://www.namc.co.za/research-portal/wp-content/uploads/2016/04/Working-Paper-Market-Access-Tracker-with-back-cover1.pdf>. Accessed 27 December 2016.

Njukia, J., Kaariab, S., Chamunorwac, A. and Chiurid, W., 2011. Linking Smallholder Farmers to Markets, Gender and Intra-Household Dynamics. *European Journal of Development Research*. 23, pp.426–443.

Ncube, E., Flett, B.C., Waalwijk, C. and Viljoen A., 2011. Fusarium spp. and levels of fumonisins in maize produced by smallholder farmers in South Africa. *S Afr J Sei*, 107 (1/2), pp.360-367.

Njukwe, E., Hanna, R., Sarr, P.S., Shigeru, A., Kirscht, H., Mbairanodji, A., Bissa, T.N. and Tenkouano, A., 2014. Cassava value chain development through partnership and stakeholders' platform in Cameroon. *International Journal of Agricultural Policy and Research*, 2(11), pp. 83-392.

Norusis, M.J., 2004. Straight talk about data analysis and IBM SPSS statistics. Available at [www.norusis.com/books](http://www.norusis.com/books). Accessed 17 August 2015.

Nxumalo, K.K. and Oladele, O.I., 2013. Factors affecting farmers participation in agricultural programme in Zululand District, KwaZulu Natal Province, South Africa. *Journal of Social Science*, 34(1), pp.83-88.

Nyikai, R.A., 2003. Commercial and smallholder farming: What is the future for smallholder Kenyan agriculture? Department of Agricultural Economics, University of Nairobi. *African Crop Science Conference Proceedings*. 6, pp.591-596.

Obiora, C.J., 2014. Agricultural Transformation Agenda in Nigeria: How Prepared is the Technology Transfer-Sub System? *Journal of Biology, Agriculture and Healthcare*, 4(2), pp.82-85.

Ogeto, R.M., Cheruiyot, E., Mshenga, P. and Onyari, C.N., 2013. Sorghum production for food security: A socio-economic analysis of sorghum production in Nakuru Country, Kenya. *African Journal of Agricultural Research*, 8(47), pp.6055-6067.

Ojiagu, N.C. and Uchenna, C.O., 2015. Effects of membership of cooperative organisations and Determinants on farmer members' income in rural Anambra State, Nigeria. *International Journal of Scientific and Technology Research*, 4(08), pp.28-35.

Oni, S.A., Maliwichi, L.L. and Obadire, O.S., 2010. Socio-economic factors affecting smallholder farming and household food security: A case of Thulamela local municipality in Vhembe District of Limpopo Province, South Africa. *African Journal of Agricultural Research*, 5(17), pp.2289-229.

Olaoye, O.A., 2014. Potentials of the agro industry towards achieving food security in Nigeria and other Sub-Saharan African countries. *Journal of Food Security*, 2(1), pp.33-41.

Olubode-Awosola, O.O. and Van Schalkwyk, H.D., 2006. Mentorship alliance between South African farmers: Implications for sustainable agriculture sector reform. *South African Journal of Economic and Management Sciences*, 9(4), pp.554-566.

Oparinde, L.O.O. and Daramola, A. G., 2014. Determinants of market participation by maize farmers in Ondo State, Nigeria. *Journal of Economics and Sustainable Development*, 5(1), pp.69-77.

Osmani, A.G. and Hossain, E., 2015. Market participation decision of smallholder farmers and its determinants in Bangladesh. *Economics of Agriculture*, 62(1), pp.63-179.

Perdomo, G., 2014. Down home on the hobby farm. *Maclean's*, 125(21), pp.38-38.

Peshin, R., Jayaratne, K.S.U. and Sharma, R., 2014. IPM Extension: A Global Overview, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, and Kashmir, India, North Carolina State University, NC, USA.

Poon, K. and Weersink, A., 2011. Factors affecting variability in farm and off-farm income. Structure and performance of agriculture and agri-products industry network. Available at [http://ageconsearch.umn.edu/bitstream/102064/2/SPAA\\_Variance\\_of\\_farm\\_incomes\\_01.pdf](http://ageconsearch.umn.edu/bitstream/102064/2/SPAA_Variance_of_farm_incomes_01.pdf).

Accessed 01 November 2015.

Relating, P.M. and Obi, A., 2015. An analysis of institutional factors influencing vegetable production amongst small-scale farmers in six vegetable projects of the Noncore Local Municipality. *Journal of Agricultural Science*, 7(6), pp.184-196.

Candela, R., Alamo, Z.G., Grunewald, J.A., 2008. Factors enhancing market participation by small-scale cotton farmers. *Agrekon*, 47(4), pp. 451-469.

Rather, S. and Fatal, S., 2013. Vegetable cultivation in Uttarakhand hills: Viewing through a gender lens. *Tropical Agricultural Research*, 24(3), pp.238-2478.

Sajeev, M.V., Singha, A.K. and Venkatasubramanian, V., 2012. Training needs of farmers and rural youth: An analysis of Manipur State, India. *Journal of Agricultural Science*. 3(2), pp.103-112.

Salami, A., Kamara, A.B. and Brixiova, Z., 2010. Smallholder agriculture in East Africa: Trends, constraints and opportunities. Working Papers Series, Tunisia. Available at <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/WORKING%20105%20%20PDF%20d.pdf>. Accessed 13 June 2016.

Seng, K., 2014. Determinants of farmers' agricultural diversification: The case of Cambodia. *Asian Journal of Agriculture and Rural Development*, 4(8), pp.414-428.

Sichoongwe, K., Mapemba, L., Tembo, G. and Ng'ong'Ola, D., 2014. The determinants and extent of crop diversification among smallholder farmers: A case study of Southern Province Zambia. *Journal of Agricultural Science*, 6(11), pp.150-159.

Sikwela, M.M. and Mushunje, A., 2013. The impact of farmer support programmes on household income and sustainable in smallholder production: A case study of Eastern Cape and KwaZulu Natal framers, South Africa. *African Journal of Agricultural research*. 8(21), pp. 2502-2511.

Sims, B. and Kienzle, J., 2016. Making mechanization accessible to smallholder farmers in Sub-Saharan Africa Brian. *Environments*. 3(11), pp.1-18.

Simon G.K., Margaret, N. and Bett, H., 2015. Determinants of farmer participation in collective marketing and intensity of participation in indigenous chicken markets in Western Kenya. *Journal of Agriculture and Veterinary Science*, 8(10), pp. 98-10.

Smalley, R., 2013. Plantations, contract farming and commercial farming areas in Africa: A comparative review. Institute for poverty and agricultural studies. Working paper, 055. Available at [www.fao.org/uploads/media/FAC\\_Working\\_Paper\\_055.pdf](http://www.fao.org/uploads/media/FAC_Working_Paper_055.pdf). Accessed 10 May 2015.

Sokoni, C.H., 2008. Commercialization of smallholder production in Tanzania: implications for sustainable resources management. *Geographical Journal*, 174(2), pp.149–175.

Steyn, M., Nortje, K., Funke, N., Jacobs, I., and Claassen, M., 2010. What are the central issues of the livelihoods and biodiversity interface in our case areas? The case of the greater Kruger area in South Africa. Sustainable Livelihoods and Biodiversity in Developing Countries. Available at <http://cdn.livediverse.eu/wp-content/uploads/2009/10/South-African-Case-Study-Area-Context-Report-Final-5-Julx.pdf>. Accessed 12 July 2015.

Thamaga-Chitja, J.M. and Morojele, P., 2014. The context of smallholder farming in South Africa: Towards a livelihood asset building framework. *Journal of Human Ecology*, 45(2). pp. 147-155.

Tolno, E.T., Kobayashi, H., Ichizen, M., Esham, M. and Balde, B.S., 2015. Economic analysis of the role of farmer organizations in enhancing smallholder's potato farmer income in middle Guinea. *Journal of Agricultural Science*, 7(3), pp.123-137.

Tolno, E.T, Kobayashi, H., Ichizen, M., Esham, M. and Balde, B.S., 2016. Potato production and supply by smallholder farmers in Guinea: An economic analysis. *Asian Journal of Agricultural Extension, Economics and Sociology*, 8(3), pp.1-16.

Tufa, A., Berkeley, A., and Nemed, L., 2014. Determinants of smallholder commercialization of horticultural crops in Gem chis District, West Harare Zone, Ethiopia, *African Journal of Agricultural Research*, 9(3), pp.310-319.

Van Bo, N., 2012. Agricultural extension in Vietnam: Its roles, problems and opportunities. Available at [http://www.syngentafoundation.org/\\_\\_temp/BO\\_AG\\_EXTN\\_VIETNAM.pdf](http://www.syngentafoundation.org/__temp/BO_AG_EXTN_VIETNAM.pdf). Accessed 25 August 2015.

Van Nicker, J.A., Storable, A., van Rooney, C.J., Whitfield, K.P. and Swanepoel, F.J.C., 2009. Towards designing a new agricultural extension service for the Eastern Cape Province: A perception analysis. *J Agric Ext*, 38, pp.65 – 76.

White, D. and Korotayev, A., 2004. Statistical analysis of cross-tabs. Available at <http://eclectic.ss.uci.edu/~drwhite/courses/StatGuide.pdf>. Accessed 2 June 2015.

Wickramasinghe, A., 2009. Tackling poverty and gender inequality through agricultural commercialization in rural Sri Lanka: A case study. Available at [http://www.faoilo.org/fileadmin/user\\_upload/fao\\_ilo/pdf/Papers/17\\_March/Wickramasinghe\\_\\_final\\_.pdf](http://www.faoilo.org/fileadmin/user_upload/fao_ilo/pdf/Papers/17_March/Wickramasinghe__final_.pdf). Accessed 17 March 2015.

Worku, A., 2016. Agricultural advisory service access among rural women in male-headed households: Constraints and prospects in Ethiopia. *Journal of Poverty, Investment and Development*, 20, pp.35-39.

Wooldridge JM (2009). *Introductory Econometrics, A Modern Approach*, Fourth edition. Michigan State University.

Yamusa, I. and Adefila, J. O., 2014. Farmers' cooperatives and agricultural development in Kwali area council federal capital territory Abuja, Nigeria. *International Journal of Humanities and Social Science*, 4(7), pp.161-169.

Zhang, F.Q. and Donaldson, J.A., 2010. From peasants to farmers: Peasant differentiation, labor regimes and land-rights institutions in China's agrarian transition. *Politics and Society*, 38(4), pp.458-489.

Zhou, S., Minde, I.J and Mtigwe, B., 2013. Smallholder agricultural commercialization for income growth and poverty alleviation in Southern Africa: A review. *African Journal of Agricultural Research*, 8(22), pp.2599-2608.

## 7 APPENDICES

### Appendix 1: Consent form to be completed by all the respondents

#### Consent form to be completed by all the respondents

<b>CONSENT FORM</b>		
<b>University of Venda</b>		
<b>Topic: Factors contributing to the transformation of smallholder farming to commercial farming in Mutale Local Municipality of Limpopo Province</b>		
The consent form is designed to check that you understand the purposes of the study, that you are aware of your rights as a participant and to confirm that you are willing to take part.		
Please tick as appropriate		
	YES	NO
1. The nature of the study has been described to me.		
2. I have received sufficient information about the study for me to decide whether to take part.		
3. I understand that I am free to refuse to take part if I wish.		
4. I understand that I may withdraw from the study at any time without having to provide a reason.		
5. I know that I can ask for further information about the study from the research team.		
6. I understand that all information arising from the study will be treated as confidential.		
7. I know that it will not be possible to identify any individual respondent in the study report, including myself.		
8. I agree to take part in the study.		

I..... (Print names) confirm that quotations from the interview can be used in the final research report and other publications. I understand that these will be used anonymously and that no individual respondent will be identified in such a report.

Signature:

Date:

**Appendix 2: FARMERS QUESTIONNAIRE ON ASSESSMENT OF THE FACTORS  
CONTRIBUTING TO THE TRANSFORMATION OF SMALLHOLDER TO COMMERCIAL  
FARMING IN MUTALE LOCAL MUNICIPALITY OF LIMPOPO PROVINCE**

Dear respondent

My name is Elekanyani Nekhavhambe from the school of Agriculture at the University of Venda. I am conducting research on smallholder farmers in the Mutale Local Municipality. The purpose of the research is to find out some challenges that smallholder farmers like you, could be facing. Whereas the research is for my masters' studies, I will communicate the findings to you in a meeting that I will later arrange. In my whole study, I will ensure that your name remains anonymous at all times. Only generalized findings will be published.

You are not forced to participate in this study and you may withdraw at any time during the interview. However, your participation is critical for the success of this study. Although your name will not be revealed or written on the questionnaire, we shall humbly request your contact number in case we require clarity later-on. Note that there are no right or wrong answers.

For further information you may contact my supervisor, Prof P.K Chauke, at the following numbers:

Cell: 0794963140

Office: 015-9629002

.....

SIGNATURE OF RESPONDENT

DATE

**INSTRUCTIONS:**

Please answer the following questions by crossing(X) on the relevant Block or writing down your answer in the space provided.

Example on how to complete this questionnaire:

Your gender? If you are male;

Male	X	1
Female		0

**SECTION A: DEMOGRAPHIC AND PRODUCTION PROFILE**

Please answer the following questions as honestly as possible.

**1. SOME CRITICAL SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS**

1.1. Gender of the respondent

	Category
Male	1
Female	2

1.2. Age of the respondent or year of birth

.....

1.3. Educational level

	Category
No schooling	0
Primary	1

Secondary		2
Tertiary		3
Other		4
If other, specify		

1.4. How much is your average household income per month in rands?

.....

1.4.1 Specify the source of your income.

		Category
Agriculture		1
Full employment		2
Self-employment		3
Social grant		4
Other		5
If other, specify		

1.5. Do you receive Agricultural extension services?

		Category
Yes		1
No		0

1.6. Do you have access to credit?

		Category
Yes		1
No		0
If yes, specify how you access the credit .....		

## 2. FARMING SYSTEM AND PRODUCE TYPE

2.1. What is your farming system?

Farming system		Category
Irrigation land system		1
Dry land system		2
Fruit production system		3
Other		4

2.2. What type of products do you produce?

Type of product		Category
Vegetable (cabbages, spinach, carrots, etc.)		1
Maize		2
Citrus, Litchis and mangos		3

2.3. How big is your land?

.....

2.4. Land tenure type

What type of Land tenure is it?		Category
Private land		1
Rented land		2
Communal land		3

2.5. Awareness about marketing of farm produce

Do have market access for your farm produce?	Category
Yes	1
No	0

2.6. If yes in 2.5, where do you sell your produce?

What type of market do you use?	Category
Local village	1
Within district	2
Within the Province (Limpopo)	3
National	4
Export market	5
If other specify .....	6

**SECTION B: FACTORS THAT COULD TRANSFORM FARMERS**

**3. Key factors for commercialization**

3.1. Do you have access to agricultural information?

	Category
Yes	1
No	0

If yes in 3.1, indicate your information providers.

	Category
Government (Extension officers)	1

Private organization such as NTK		2
Extension agents		3
Websites (internet)		4
Agricultural television station		5
If other, specify		6

3.2. Do you have any market services support, e.g. Transportation, roads, storage facilities, etc.?

		Category
Yes		1
No		0

3.2.1 If yes in 3.2, specify your support service.

		Category
Transportation service		1
Roads		2
Storage facilities		3
Shelters		4
All of the above		5
If other, specify.		6

3.3. Do you receive education and trainings?

		Category
Yes		1

No		0
----	--	---

3.3.1 If yes in 3.3, specify your training providers.

Source of your education and training		Category
NGO (Non-governmental Organization) such as NTK		1
Government such as Extension officers		2
Private such as University		3
Learning from cooperatives		4

3.4. Do you receive any form of government subsidies?

		Category
Yes		1
No		0
If yes, indicate how government subsidies were assisting your business. .....		

3.5. Do you have access to farmers' organization? e.g. Cooperatives

		Category
Yes		1
No		2
If yes, give the name of the organization. .....		

3.6. Who provides you with financial support?

Source of financial support		Category
Banks		1
Government funds		2
Other		3
If other, specify .....		

3.7. Do you have access to supply of inputs e.g. seeds, pesticides, etc.?

		Category
Yes		1
No		0
If yes, indicate how you purchase your farm inputs; example of credit purchase, contract or cash purchase. .....		

**SECTION C: GENERAL CHALLENGES**

4. What are the challenges you face in your farm?

.....

.....

.....

.....

.....

Thank you for your co-operation in this questionnaire.

**Appendix 3: QUESTIONNAIRE ON EXTENSION OFFICERS VIEWS TO FACTORS THAT HAMPERS SMALLHOLDER FARMER FROM TRANSFORMATION**

Dear respondent

My name is Elekanyani Nekhavhambe from the school of Agriculture at the University of Venda. I am conducting research on smallholder farmers in the Mutale Local Municipality. The purpose of the research is to find out some of your views regarding to factors that hamper commercialization of smallholders farming and solutions that you could suggest in improving agriculture in the society at large. Whereas the research is for my masters' studies, I will communicate the findings to you in a meeting that I will arrange. In my whole study, I will ensure that your name remains anonymous at all times. Only generalized findings will be published.

You are not forced to participate in this study and you may withdraw at any time during the interview. However, your participation is critical for the success of this study. Although your name will not be revealed or written on the questionnaire, we shall humbly request your cell or phone number in case we require clarity later-on. Note that there are no right or wrong answers.

For further information you may contact my supervisor, Prof P.K Chauke, at the following numbers

Cell: 0794963140

Office: 015-9629002

.....

.....

SIGNATURE OF RESPONDENT

DATE

**INSTRUCTIONS:**

Please answer the following questions by crossing(X) on the relevant Block or writing down your answer in the space provided.

Example on how to complete this questionnaire:

If Agree (A)

CATEGORY	The following are the factors that hamper commercialization		SA	A	D	SD
A <sub>1</sub>	1	Lack of ownership to land	1	<del>2</del>	3	4

**SECTION A: VIEWS OF EXTENSION OFFICERS**

This questionnaire explores the factors that hamper the transformation of smallholder farming to commercial farming in Mutale Local Municipality.

To what extent do you agree with each of the statements in the table below? Please indicate your responses using the following 4-point scale where:

1= Strongly Agree (SA)

2= Agree (A)

3= Disagree (D)

4= Strongly Disagree (SD)

1. What are the factors that hamper the transformation of smallholder farmers to commercial farmers in Mutale Local Municipality?

CATEGORY	The following are the factors that hamper commercialization:		SA	A	D	SD
A <sub>1</sub>	1	Ownership to land	1	2	3	4
A <sub>2</sub>	2	Diversification of farming produce	1	2	3	4
A <sub>3</sub>	3	Availability of market for farm produce is limited	1	2	3	4
A <sub>4</sub>	4	Financial support	1	2	3	4
A <sub>5</sub>	5	Famers are affected by climatic whether conditions	1	2	3	4
A <sub>6</sub>	6	Use of Genetic Modified Inputs(GMI)	1	2	3	4
A <sub>7</sub>	7	Aging farmers	1	2	3	4
A <sub>8</sub>	8	Low mechanization	1	2	3	4
A <sub>9</sub>	9	Limited farming knowledge	1	2	3	4
A <sub>10</sub>	10	Poor infrastructure	1	2	3	4

1.2. How best can farmers improve their farming activities?

.....

.....

1.3 What are other challenges that famers are facing?

.....

.....

**Thank you for your co-operation in this questionnaire.**