ANALYSIS OF SAVINGS' DETERMINANTS AMONG SMALLHOLDER CASH CROP FARMERS: A CASE STUDY OF POLOKWANE LOCAL MUNICIPALITY IN LIMPOPO PROVINCE, SOUTH AFRICA

by

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MINI-DISSERTATION Submitted in partial fulfilment of the requirements for the degree of

Master of Science

in

AGRICULTURE (AGRICULTURAL ECONOMICS)

in the

FACULTY OF SCIENCE AND AGRICULTURE

(School of Agricultural and Environmental Sciences)

at the

UNIVERSITY OF LIMPOPO

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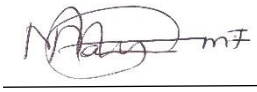
2021

DEDICATION

This mini dissertation is dedicated to my late mother Margaret D.

DECLARATION

I, MORONGWA INNOCENT MARUTHA, declare that the mini dissertation hereby submitted to the University of Limpopo, for the degree of Master of Science in Agriculture (Agricultural Economics) has not been previously submitted by me for a degree at this or any other university. This is my own work in design and in execution, and that all materials contained herein has been duly acknowledged.



Signature

16/01/2021

Date

ACKNOWLEDGEMENTS

I would like to give thanks to the Almighty God who made everything possible for me. He guided and preserved me as I was working on this study. I am very thankful to my main Supervisor, Prof I.B Oluwatayo and the Co-supervisor, Prof A Belete for taking time to graciously assist me with this research. I sincerely thank you for your consistent guidance and commitment from the beginning of my studies to the end. God bless you.

I want to extend my humble gratitude to the smallholder cash crop farmers of Polokwane Local Municipality who agreed to participate as respondents for this study and for your cooperation and commitment to this study. This study would have not been successful without you. I also want to appreciate the research office at the Department of Agriculture and Rural Development in Polokwane Municipality, for willingly granting me permission to carry out this study in the Municipality, providing me with assistance and access to the database about smallholder farmers in the study area.

To the person who has unconditionally supported me throughout my postgraduate studies, Morton Tlemo, and to Potsiso Lethiba who assisted me towards the end of this study, thank you.

ABSTRACT

Smallholder cash crop farmers form part of the economy's growth potential and savings are enormously important for stability within their farms. Farmers in South Africa have been faced with environmental catastrophes such as: droughts, floods, etc. These farmers require a backup for them to rise after these environmental disasters. This is where savings start to become more imperative for smallholder farmers. Regardless of how important savings are, South Africa has been characterized by low and declining savings from the household level and smallholder cash crop farmers typically generate income for consumption without saving. This study examined the savings' determinants among smallholder cash crop farmers in Polokwane local municipality. A non-probability sampling technique called purposive sampling was used in this study and 70 smallholder cash crop farmers participated as respondents for this study. Descriptive statistics were used to describe the socio-economic characteristics of the smallholder cash crop farmers; the cash crops grown by these farmers and the constraints that militated against their savings. While the binary logistic regression model was employed to analyze the factors influencing savings of the smallholder cash crop farmers. The most preferred cash crops by the farmers in the study area are maize, potatoes, tomatoes, butternut, and groundnuts. The factors influencing the savings by these farmers are farm: income ($p<0,050$), household size ($p<0,014$) , farm size($p<0,045$) , membership in a cooperative or association($p<0,018$) and financial literacy($p<0,048$).The major constraints that militated against savings by these farmers are: farm income, the cost of their labour, financial illiteracy and banking costs. It was discovered in this study that smallholder farmers' savings ability, regardless of their intentions or willingness to save is highly dependent on their income and farming costs. Therefore, the study recommends that strategies to increase smallholder cash crop farmer's income must be harnessed through provision of other income generating opportunities. Financial illiteracy adversely affects the smallholder cash crop farmers' ability to save, and it is also recommended that smallholder cash crop farmers should be provided with financial education.

TABLE OF CONTENTS

CONTENT	PAGE
DEDICATION	**i**
DECLARATION	**ii**
ACKNOWLEDGEMENTS	**iii**
ABSTRACT	**iv**
LIST OF TABLES	**viii**
LIST OF FIGURES	**ix**
LIST OF ABBREVIATIONS AND ACRONYMS	**x**
CHAPTER ONE: INTRODUCTION	**1**
1.1 Background	1
1.2 Problem statement	3
1.3 Research questions	3
1.4 Rationale	4
1.5 Aim and Objectives	5
1.5.1 Aim	5
1.5.2 Objectives	5
1.6. Organizational Structure of the study	5
CHAPTER TWO: LITERATURE REVIEW	**7**
2.1 Introduction	7

2.2. Definition of key concepts 7

2.3. Importance of smallholder cash crop farmers in the south African economy 10

2.4. Motives and roles of savings 11

2.5. Determinants of farmers' savings 12

2.6. Chapter Summary 17

CHAPTER THREE: RESEARCH METHODOLOGY 19

3.1 Introduction 19

3.2 Study area 19

3.3 Data set 21

3.3.1 Research design 21

3.3.2. Sampling 21

3.4. Ethical considerations 21

3.5. Analytical techniques 22

3.6. Limitations of the study 25

CHAPTER FOUR: RESULTS AND DISCUSSIONS 26

4.1. Introduction 26

4.2. Smallholder cash crop farmers' socio-economic characteristics 26

4.3. Cash crops preferred by smallholder cash crop farmers 35

4.4. Constraints to savings among smallholder cash crop farmers 36

4.5. Determinants of savings among smallholder cash crop farmers 42

4.6. Chapter summary 43

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS 44

5.1. Introduction 44

5.2. Summary of findings 44

5.3. Conclusion 45

5.4. Recommendations 46

5.4.1. Recommendations to smallholder cash crop farmers and policy makers 46

5.4.2. Recommendations for further studies 48

REFERENCES 49

Annexure A: Questionnaire 54

Annexure B: Approval for data collection 60

Annexure C: Ethical clearance 61

LIST OF TABLES

Table 3.1: Table describing variables used in the binary logistic regression model 23

Table 4.1: Household size 28

Table 4.2: Results from the binary logistic regression model 37

Table 4.3: Model summary 38

LIST OF FIGURES

Figure 3.1: Polokwane local municipality map 19

Figure 4.1: Gender of farmers 26

Figure 4.2: Age of the farmers 27

Figure 4.3: Marital status of the farmers 29

Figure 4.4: Educational level 30

Figure 4.5: Financial literacy 31

Figure 4.6: Farm size 31

Figure 4.7: Farming experience 32

Figure 4.8: Membership in a cooperative or association 33

Figure 4.9: Access to extension services 33

Figure 4.10: Market access 34

Figure 4.11: Ownership of farm bank account 35

Figure 4.12: Preferred cash crops by smallholder farmers in the area 35

LIST OF ABBREVIATIONS AND ACRONYMS

DAFF – Department of Agriculture, Forestry and Fisheries

MAFISA – Micro-Agricultural Financial Institutions of South Africa

SPSS - Statistical Package for Social Sciences Stats SA – Statistics South Africa

TREC – Turfloop Research Ethics Committee

CHAPTER ONE

INTRODUCTION

1.1. Background

Smallholder cash crop farmers form part of the economy's growth potential. According to Senthilkumar (2017), the growth of cash crops has significant potential for bringing about faster development of agro-based industries. This means that agriculture not only contributes to overall growth of the economy but also reduces poverty. Agriculture reduces poverty through the provision of employment and food security to the majority of the population. Economic fluctuations, climate risks and a number of shocks leave smallholder cash crop farmers in a great vulnerability to loss. These farmers' propensities to save play a vital role in the growth and stability within their farming enterprises. High transaction cost is one of the major factors constraining growth and stability of smallholder cash crop farmers in South Africa and this is typically attributed to poor infrastructure (DAFF,2012).

Agriculture contributes the least to economic development in Polokwane Local municipality as compared to other economic sectors. According to South African Cities Network (2014) the reason for this limited contribution by Agriculture is lack of commitment by the Provincial Department of Agriculture. The Provincial Department of Agriculture lacks commitment to invest into agricultural activities and programmes within their municipality, this means that cash crop farmers in the area should be self-sustained and have the ability to save their earnings in order to maintain stability. Cash crops grown in Limpopo province range from horticultural crops such as: tomatoes, sugarcane, vegetables, potatoes, bananas, fruit trees to field crops namely maize, sorghum, beans, groundnut, sunflower, cowpeas (Oni *et al*.,2012).

Savings in this instance is defined as that part of current income, after the payment of operation costs and direct taxes, that is not consumed immediately but kept for future use. According to Osondu *et al.* (2015), savings have both direct and indirect uses. Directly, savings could be used for investment. Indirectly, savings indicate the ability to repay debt, increase credit rating and can serve as collateral in a credit market (Brata, 1999 as cited by Osondu *et al.,*2015).

In their study on savings mobilization strategy, DAFF (2009) stated that the economically active poor saved for emergencies using various indigenous institutions such as stokvels, savings clubs, umgalelos etc. The presence of informal savings schemes in both urban and rural communities of South Africa have demonstrated the potential for leveraging savings for sustainable livelihoods. It was also discovered that, regardless of the presence of the savings schemes, the specific use of micro-savings as a strategy to enhance livelihood strategies is almost unknown in South Africa, despite wide recognition of its importance elsewhere in the developing world (DAFF, 2009). Brune *et al*. (2011) also highlighted that the low-income individuals, encounter difficulties in saving in the formal banking institutions. Instead, they rely on more expensive and riskier methods to save informally which include cash held at home.

Smallholder farmers in South Africa are characterized by their engulfment in vicious cycle of poverty due to low productivity, income, and savings. One of the constraints faced by smallholder cash crop farmers in South Africa as identified by DAFF (2012) is accessibility to finance which is a result of lack of credit worthiness, no collaterals and inability to develop bankable business plans. And to overcome such a constraint, there needs to be an analysis of savings ability of smallholder farmers. The saving of the smallholder farming sector is very important to the South African economy, because of the employment potential in them which could contribute to the growth of the other sectors of the economy. Without savings, farmers have few other mechanisms to smooth out unexpected variations in their farming enterprises.

Smallholder cash crop farmers need financial stability (Ebissa and Kassie, 2017). Financial stability can be achieved through income savings and can play a meaningful role in climate adaptation through increasing the resilience of agriculture to climate change, thus contributing to longer term food security. Smallholder cash crop farmers in South Africa need to be encouraged to save from their farm income for them to be able to access finance as well. However, it needs to be recognized that the encouraged farm savings are most attractive where farm debt levels are low. Farmers with low levels of farm income might be precluded from building meaningful savings accounts because they are always swimming in debt and debt repayment may be a more attractive option for them as compared to savings.

1.2. Problem statement

Cash crops bring substantial wage and employment opportunities to the rural economy (Achterbosch *et al*., 2014) and according to Zhang *et al*.(2017), cash cropping is traditionally identified as an important enterprise undertaken by farmers to increase incomes. Savings are enormously important for stability within the farms. According to Zeller and Sharma (2000) as cited by Osondu *et al*. (2015), savings are very imperative for accumulation of capital required to generate future income, enable future consumption and providing a form of a bulwark to help people cope in times of crisis. A savings background additionally serves as an advantage when the farmer wants to obtain credit.

Farmers in South Africa have been faced with environmental catastrophes such as droughts (Allison, 2015), floods, etc. and in most cases they then require a backup for them to rise after these disasters and this is where savings start to become more imperative for smallholder farmers. South Africa has been characterized by low and declining savings from the household level (Kasongo and Ocran, 2017) and farmers usually generate income for consumption without saving. This study therefore analyses the savings' determinants among smallholder cash crop farmers in Polokwane local municipality by attempting to address the stated research questions:

1.3. Research questions

i. What are the socio-economic characteristics of smallholder cash crop farmers in the study area?
ii. What are the preferred cash crops by the smallholder cash crop farmers?
iii. What are the factors that influence savings by the smallholder cash crop farmers?
iv. What are the constraints that militate against savings by the smallholder cash crop farmers?

1.4. Rationale

Savings remain a driving force of economic stability (Ebissa and Kassie, 2017). Smallholder cash crop farmers need to build up capital stock on their farms from their own savings (Njamweah and Kidombo, 2018). This is because not all farmers can get agricultural loans or credit from the lending institutions. Cash crops provide a stimulus to agricultural innovation by raising capital for agricultural investment and could lead to further commercialization (Achterbosch *et al*., 2014), as a result, if smallholder cash crop farmers have savings, their potential for growth could be accelerated. Saving and growth are strongly positively correlated across countries (Carroll *et al*., 2000), this means that for South Africa to realize growth through smallholder cash crop farming, these farmers in all municipalities need to be able to save from their earnings.

The deliberate decision on the part of the farmers to save for meeting the future needs and overcoming shocks is affected by a number of factors that affect the farmer's ability to save. According to Nwibo and Mbam (2013), savings habit of a person is measured by his or her marginal propensity to save which in turn is determined by various factors. Available sources of finance that smallholder farmers could take advantage of and grow their small farms require the farmers to have the ability to save. Micro Agricultural Financial Institution of South Africa (MAFISA) is a financial scheme to address the financial services needs of smallholder farmers (DAFF, 2019). The existence of a savings history for the farmer serves as an advantage for them to benefit from MAFISA, especially if they have consistent patterns of savings. For smallholder cash crop farmers to maintain stability in their farms, they need to be able to safe for unforeseen circumstances (Musiime and Atuha, 2011), their good capital management skills and credit acquisition abilities will not always serve as a buffer for unforeseen circumstances.

To ascertain if smallholder cash crop farmers have the ability to save and maintain farming stability, there is a need for a study that will centre on savings as a source of farm finance used to ensure stability. Studies have been done about farmers savings (Musiime and Atuha,2011; Odoemenem *et al*., 2013, Osondu *et al.,* 2015; Kolandavel and Nigatu, 2017; Obalola *et al.,*2018; Mamman *et al.,* 2019) but limited studies have been done about savings' determinants among smallholder cash crop farmers in

Polokwane local municipality. It then becomes imperative to investigate the determinants of savings among smallholder cash crop farmers in this study area.

This study contributes to the previous literature gap by developing a conceptual understanding of saving behaviour of smallholder cash crop farmers in Polokwane local municipality. Policy makers have not really drawn up an adequate and comprehensive savings scheme that is inclusive for smallholder cash crop farmers and will motivate the farmers to save. The results from this study will assist policy makers to be able to draw up an adequate and comprehensive savings scheme that will motivate the smallholder cash crop farmers to save and develop an understanding of why they should save.

1.5. Aim and objectives of the study

1.5.1. Aim

The aim of this study is to analyze the determinants of savings among smallholder cash crop farmers in Polokwane local municipality of Capricorn district in Limpopo province of South Africa.

1.5.2. Objectives

The objectives of the study are to :

i. identify and describe the socio-economic characteristics of smallholder cash crop farmers in the study area.
ii. identify the most preferred cash crops grown by the smallholder cash crop farmers in the study area.
iii. determine and analyze the factors that influence savings by the smallholder cash crop farmers in the study area.
iv. identify the constraints that militate against savings by the smallholder cash crop farmers in the study area.

1.6. Organizational structure of the study

This study consists of five chapters whereby the first chapter introduces the study by outlining the background, problem statement, the aim, and objectives as well as the hypotheses. The second chapter covers the literature review which provides the

related literature on the determinants of savings among smallholder cash crop farmers. Chapter three presents the methodology implemented to achieve the given objectives in chapter one. Chapter four provides the results obtained and discussions about these results. In chapter five, the summary, conclusions, and recommendations of the study are provided.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

Previous literature connected to this study is thoroughly reviewed in this chapter. The purpose is to link and compare this study with the related research projects that have been previously conducted both locally and internationally. The comparison of this study with the previous studies is necessary to help us know if there are any differences or changes in this field of study through the results gathered by different authors. The chapter covers different definitions of key concepts following this research as a result of how other authors previously defined them. From defining the key terms, the chapter provides the information about the importance of smallholder cash crop farmers in the South African economy, the motives and roles of savings, the determinants of savings by the farmers and lastly, a review of previous studies. The literature reviewed is then summarized at the end of this chapter.

2.2. Definition of key concepts

Cash crop

A cash crop is plant or animal product in the agricultural industry which is grown and harvested to sell for making profit. According to Govereh and Jayne (2003), the term cash crop, is used to differentiate marketed crops which are grown specifically for selling from subsistence crops, which are grown as food for the producer's family. Cash crop produced by farmers in this study are the agricultural crops that farmers grow and sell to generate income in the form of cash. The income generated from cash crops is used differently based on the farmer’s choice. Some farmers use the income solely for consumption while others use the income for farming activities and growing their farm enterprises. A cash crop generally refers to a marketed crop (Govereh and Jayne, 2003).

Savings

According to Amu and Amu (2012) as cited by Osondu *et al*. (2015), savings means putting something aside for future use. When an individual decides to keep something that could be used now for the future, this is regarded as savings and thinking towards the future. In economics, savings is regarded as the difference between the disposable

income and the personal consumption expenditure or rather the income that is not consumed immediately (Odoemenem *et al*., 2013). Odeoemenem *et al*.(2013) view the savings as the portion of income that the individual or rather household keep aside and do not use on current needs and wants. Canova *et al*.(2005) defined savings from a psychological point of view, they stated that savings can be considered as a result of a deliberate decision-making process and to save means regularly putting away some resources for a certain future goal. The implication is that, for someone to be considered as a person who saves, they should have deliberately decided to keep some resources aside without consuming then and this should be a regular activity that is meant to meet future goals (Canova *et al*., 2005).

Nayak (2013) defines savings as the part of the income earned by the individuals, this part of the income is not consumed, and it explains the marginal propensity to save for an individual. Nayak (2013) definition of savings is in line with the definitions of Odoemenem *et al*. (2013) in that it is concerned only with the portion that is kept aside from the income made. Mamman *et al*. (2018) has defined savings in line with the definitions of Canova *et al*. (2005), Odoemenem *et al*. (2013), Nayak (2013) and Obayelu (2013) by stating that savings can also be regarded as a means of sacrificing the current consumption in order to increase the living standard and fulfilling daily requirement in future. Though according to Shittu (2012) as cited by Mamman *et al*. (2018) the term savings, is broad and can be made in various forms such as cash or non-cash, cash saving is the cash in the form of currency which can be saved through banks, self-help association and at home. The non-cash methods of saving which include the purchase of land, storage of agricultural produce etc (Mamman *et al*.,2018).

Keynes defined savings as keeping part of the income generated. Keynes (1936) as cited by Obayelu, (2013) defined savings as the amount left over when the cost of consumer expenditure is subtracted from the disposable income that he or she earns in a given period of time. Keynes (1936) did not necessarily viewed savings as a deliberate decision to sacrifice current pleasures that money can buy but viewed savings as money that has been left over after all needs of the individual are covered.

Savings in this study follows the literature of Canova *et al*. (2005), Odoemenem *et al*. (2013), Nayak (2013), Obayelu (2013) and Mamman *et al*. (2018) and is therefore defined as money in the form of cash that an individual reserve for future needs, this is the portion of the income that the cash crop farmer decides not to consume immediately but keep aside to buffer against shocks because farming is known to be a risky activity that is vulnerable to a vast amount of risks and uncertainties.

Savings propensities

Savings propensities refers to the likeliness of an individual to save from their income. According to Keynes theory (1936) the propensity to save is the same as the propensity to consume but looked in different ways as it is the ratio of income that is rather saved and not consumed. According to Blanchard (2006), the savings propensities is defined from the basis of the Keynesian economic theory and states that the propensity to save is the proportion of an aggregate in income that a consumer saves rather than spends on the consumption of goods and services. The savings propensities of cash crop farmers in this study is their likeliness to save a portion of the income cash that they earn from their different cash crop enterprises. Farmers have the choice to either consume all their earnings of keep the portion of their income for future use. The likeliness of the farmer to save is as a result of choice.

Smallholder farmers

According to DAFF (2012), smallholder has different meanings in different instances and is usually interchangeably used with ‘small-scale’, ‘resource poor’ and ‘peasant farmer’. In general terms, the definition of smallholder revolves around the resource availability, when a farmer has limited resources, produces on smaller proportion of land regardless of the land size they may possess and relies on old unimproved methods of farming, then the farmer is called a smallholder farmer (DAFF, 2012). The smallholder farmers are defined based on their characteristics which include but are not constricted to simple outdated technologies, low returns, high seasonal labour fluctuations and smaller plots of production. Smallholder farmers grow subsistence crops and one or two cash crops (DAFF,2012).

According to Lahiff and Cousins (2005) as cited by Chisasa and Makina (2012), it is difficult to define the word smallholder, they stated that there is no standard definition of a smallholder, but the term is generally used in South African context for farmers who are black and distinct from the white dominated large-scale commercial farmers. So in this instance, if you are not a large-scale commercial farmer, you may be regarded as a smallholder, small scale, substance or emergent farmers since Chisasa and Makina (2012) stated that there are no clear distinctions that can be drawn between the different categories of farmers namely: smallholder, small-scale, subsistence/ communal, or emergent farmers.

To get a clear understanding of the farmers discussed in this study, Smallholder farmers unlike just subsistence farmers, are farmers that are in business in that they can produce mainly for the market and keep the surplus for household consumption while subsistence farmers' main goal is to feed the household. This study takes the definition of smallholder cash crop farmers as resource limited farmers with smaller plots of land who are into farming in order to generate income.

2.3. Importance of smallholder cash crop farmers in the south African economy

Smallholder cash crop farmers are a group of important individuals who play a big role in their small proportion in the economy of South Africa and they have the potential to play an important role in livelihoods creation amongst the rural poor DAFF (2012). The Department of Agriculture, Forestry and Fisheries (2012) refer to the smallholder cash farmers as the drivers of growth within the developing and underdeveloped economies. The agricultural sector plays a vital role in the developing economies and the livelihoods of South Africans even though in South Africa, the contribution towards the gross domestic product is as small as 2.2% (StatsSA, 2013). According to StatsSA (2013), 86% of the South Africa population relies on smallholder agriculture for food security and livelihoods since it is also realized that the field also contributes to employment.

Smallholder farmers are perceived as important economic players (Pienaar and Traub, 2015; Olofsson, 2020). According to Pienaar and Traub (2015), the South Africa's National Development Plan (NDP) assigned smallholder agriculture, to be responsible for the development of rural citizens are the areas they reside in and the mandate is to improve the livelihoods of about 370 000 people. According to Page and Slate

(2003) as cited by Von Loeper *et al*. (2016) there is evidence that shows that an effectively producing smallholder farmer is viewed as a potential driver to lead populations out of poverty.

2.4. Motives and roles of savings

Canova *et al*. (2013) highlighted that there are eight different motives to save which are identified by Keynes (1936), these motives are : the precaution, Foresight, calculation, improvement, independence, enterprise, pride, and avarice. These are the general eight motives or objects of subjective character as defined by Keynes, which lead individuals to avoid spending their incomes. However, this study focuses on the precautionary motive which implies reserves against future risks and uncertainties. For an individual farmer, savings are as a result of precautionary motive, saving becomes the cushion for the future's intercourse of the unforeseen and upcoming as well as the uncertain circumstances of life (Nayak, 2013). According to Keynes, the precautionary motive is defined as the motive that is encouraged by the thought of possible uncertainties which may arise in the future. This motive is as a result of people being conscious of the future and willing to sacrifice current pleasure to secure the future.

Musiime and Atuha (2011), in their guide for smallholder farmers stated that the importance of savings was that many organizations that provide loans will want to see that you have the capacity to save before trusting you with their money. Savings is also important because it allows you to deal with emergencies and unforeseeable events and can allow you also to invest your savings by purchasing other valuable commodities (Musiime and Atuha, 2011).

The empirical study by Tesfamariam (2012) provided the report that the farmers who are members of a cooperative 's motives to save was more related to future investments and not the interests that could be earned from savings. These farmers show no interest in the saving benefit such as interest and this was contradictory to other empirical studies that have been carried out, concerning the motives to save. The main motives and goals of saving by these farmers were to keep for future investment, to have enough and build up a buffer stock for those unpredictable but possible and unfortunate circumstances and raise more funds to be able to purchase those future planned expenses on durable goods (Tesfamariam, 2012).

There are classical economists who studied savings and have identified savings as an important growth factor in the economy and these classical economists are Adam Smith, David Ricardo and JS (Nayak, 2013). If households or smallholder farmers fail to save, they will eventually become dependent on others or the

government. This is, unfortunately, a very common occurrence in South Africa (le Roux, 2010). For the higher economic growth for the country, the marginal propensity to save should be higher (Nayak, 2013). Hira (1987) in their study of the household financial management factors highlighted the fact that the aggregate personal and household saving directly impacts the economy as a whole. As a result, we can see that saving by individuals such as small farmers and households directly impact the state of the economy.

2.5. Determinants of farmers' savings

Previous studies that have been held on the determinants of farmers savings behaviour and factors affecting their savings or the constrains that militate against savings identified most of the socio-economic characteristics of farmers such as their farm income, household size, level of education, financial literacy, farm size, farming experience, credit access, propensity to save, background area, age and gender as the factors that have an impact on the farmers' potential to save, their view towards savings and most importantly, their ability to save.

Income

The level of income for every individual plays a vital role in their savings ability. It is seen that regardless of the willingness to save, low-income individuals have difficulty saving in formal banking institutions (Brune *et al*.,2011). According to Browning and Lusardi (1996) as cited by Tesfamariam (2012), one of their three identified factors that affected savings was the ability to save which in turn depends on a household's disposable income and expenditure. Nayak (2013) in their study of the determinants of saving behaviour in the rural household revealed that at a household level, income plays a huge role as the determinant of savings. It is stated that the lowest income groups which in most cases are the agricultural labourers or even small farmers have the highest marginal propensity to consume which leads to lowest marginal propensity to save as compared to the other occupational groups (Nayak, 2013).

Odoemenem *et al*. (2013) also revealed that income is one of the major determinants of saving and has a direct influence on the savings of the small scale farmers, they stated that increase in the income of a farmer will lead to savings, this is a positive relationship between savings and income and it means that the ability to save depends on the level of income. The results of Mamman *et al*. (2018) conform with the results of Nayak (2013) in that income affects the savings. Mamman *et al*. (2018) found that income from the farm may likely affect their savings rate and investment in profitable ventures or farms if properly managed either positively or negatively, depending on the level of income. Tesfamariam (2012) also found the related results as their analysis provided the results that the coefficient of the respondent's household annual income is statistically significant at 1% and positively related to the amount of savings showing that an annual income increase will lead savings increase, meaning that inversely, the low savings level will ultimately be the result of low-income levels.

According to Akpan *et al*. (2011), income is also an important determinant of savings. The results of Akpan *et al*. (2011) are in line with the results a number of authors (Brune *et al*., 2011; Lusardi, 1996; Nayak, 2013; Odoemenem *et al*.,2013; Mamman *et al*., 2018; Ebissa and Kassie 2017). Ebissa and Kassie (2017) concluded in their results that the annual income of the household heads is statistically positive and has a significant effect on their saving behaviour while the study of Akpan *et al*. (2011), reported that income has a significant positive effect at 1% significance level on savings, that is an increase in income means an increase in the tendency to save. This is also in line with the results of Uhueg nnbulem *et al*. (2016) which revealed that income had a significant positive relationship on the savings of small, scaled farmers. This implied for the small-scale farmers, income increase means the tendency to save increases too.

Household size

The household size of the respondents in various studies about savings has always been identified as one of the factors affecting savings, the potential to save, the willingness to save, the amount saved or rather the proportion of the individual's income that is saved. Browning and Lusardi (1996) as cited by Tesfamariam (2012), found out that family size affect savings in a negative way i.e., people with large

families do rarely save compared to those with small families. This means that the higher the household size, the higher the proportion of income required for consumption purposes and therefore the lesser the proportion to be kept aside for saving purposes. According to Brune *et al*. (2011), there are empirical studies which have identified the family as one of the determinants to save. The studies showed that another potential explanation for low savings levels in rural communities is the pressure to share income with spouses (Schaner, 2012), relatives and friends (Platteau, 2000; Hoff and Sen, 2006; Jakiela and Ozier, 2011).

Mamman (2018) identified household size as a savings determinant that is negatively significant when the dependent variable is concerned with savings and the value or the proportion that can be saved by the farmer. It is realised that the household size of the smallholder farmers has a negative influence on the savings capacity of the respondent and was statistically significant at 10%, this therefore meant that the larger the household size, the smaller the amount of savings by the farmer.

Level of education and Financial illiteracy

According to Nayak (2013), the level of education is the significant determinant of savings by individuals, Nayak (2013) study as a result of the analysis carried out, revealed that the lower the level of education, the lower the potential to save and this is as a result of less awareness of the people towards the benefits. Meaning lower levels of education shields the individual's opportunity to be exposed to information and knowledge about savings and the benefits thereof. So, if individuals do not know that savings can be beneficial for them, they are more and more likely to not participate in saving. However, Ebissa and Kassie (2017), in their study of savings behaviour by households found education level and other socio-economic characteristics of individuals as insignificant variables and this led to the idea that the level of education does not affect the savings behaviour.

Ebissa and Kassie (2017)'s findings are a contradiction to the findings of Nayak (2013). Those that have financial planning in the study of Ebissa and Kassie (2017) were found to be more likely to save. In Ebissa and Kassie (2017)'s study, financial planning is a statistically positive and significant variable towards savings, and it means that financially literate individuals are more likely to financially plan out for their future and save. Education level and financial literacy are, however, two different

determinants since education level covers all fields of education while financial education is only concerned with finance studies. According to Carpena *et al*. (2011), financial illiteracy may prevent individuals from opening accounts due lack of familiarity with account-opening procedures or at times it may be the lack of knowledge about the benefits of formal savings.

Farm size and farming experience

According to Mamman (2018), The farm size of the smallholder farmers has a positive influence on the savings capacity of the respondents and this means that the larger the farm size, the higher the farmers' propensity to save as large sized farms means more income for the farmer. The assumption here is that farmers with bigger sizes farms utilizes the larger farm size to grow and nurture their crops and make more profit than the farmers with smaller farm sizes. The larger the farm size, the more potential income and as a result, greater potential to save (Orebiyi and Fakayode 2005 as cited by Tesfamariam, 2012). As highlighted earlier that the greater the income of the individual the more chances of the individual to consider saving or participate in savings for the future.

Tesfamariam, (2012) in their study reported that their results showed that the farm size of co-operators was significant at 5% and positively related to amount of savings mobilized. Meaning that the higher the farm size of the members of that co-operative, the more savings by these farmers. Putting farm size in the position to be considered as the significant and most relevant variable when it comes to farmers savings.

Farming experience was found to be positively significant in relation to savings capacity of the farmers in the study of Mamman (2018) and this meant that farmers with good farming experience are expected to be good with appropriate timing and carrying out of farm operation, efficient resource use which can increase income generation ability and improve savings capacity. The studies of Babatunde *et al*. (2007), Kibet *et al*. (2009), and Osundare, (2013) have reported similar findings in relation to farming experience.

Credit

According to Kibet *et al*. (2009), there are a few studies that have considered credit as a factor influencing savings. Indirectly, savings indicate the ability to repay debt, also

increase credit rating (Brata, 1999 as cited by Osondu *et al*.,2015). Kibert *et al*. (2009) showed in the explanation of their results that the domestic borrowing constraint which is credit can either positively or negatively affect savings. This meant that it can be in line with the economic theory where credit access is always expected to have a negative impact on savings or follow the the study by Rogg (2000), where there is a likelihood of microentrepreneurs' savings increasing in the with increase in credit access.

Tesfamariam (2012) agreed with the idea that credit access has influence over savings by stating that the amount of loan the farmers in the studied cooperative borrowed was found to be statistically significant and positive in explaining the level of savings by the cooperative members at 1% level of significance. It was then concluded that access to credit has a positive effect on savings and therefore should be considered that an improvement in credit access will cause an increase in saving, and vice versa (Tesfamariam, 2012). This empirical study by (Tesfamariam, 2012) is in line with the economic theory which teaches that credit access is a variable that is viewed as one of the strong determinants of savings. This means that improvement in credit access is expected to have a positive impact on savings (Tesfamariam, 2012).

Propensity to save and background area

The propensity to save is identified as one of the factors that affected savings as it is known that the propensity to save is usually a result of the socio-economic characteristics such as family and education (Browning and Lusardi, 1996 as cited by Tesfamariam, 2012),. According to Nayak (2013), the marginal propensity to consume is more rather than the marginal propensity to save in most rural areas. Rural smallholder farmers are characterized will the lower saving propensities. This is said to be vice-versa in urban areas where the marginal propensity to save is more than that of the marginal propensity to consume (Nayak, 2013).

Age

In economics, the theories of savings and consumption include an economics model called the life cycle hypothesis of savings by Franco Modigliani and this hypothesis states that an individual will save portion of their income in certain stages of life and not save as they did at some point in time (Deaton,2005). This means that the older the individua gets, the more their saving levels will reduce. Fisher and Anong (2012)

in their study of savings motives and habits provided an idea that savings increase with age by referring to the studies of Chang (1994); Katona (1975) and Mirer (1979).

Sex

Male farmers have the potential to save as compared to female farmers (Odoemenem *et al*., 2013). Gender roles have always had a huge impact in farming activities and the involvement of men as a result of beliefs and traditions has resulted to the view of males as the major and important role players in the field. Therefore, farming, and agricultural business has always been a norm for men and for them to engage in saving to curb the risks that may be incurred in their farms has always been a possible probability. Odoemenem *et al*. (2013) revealed that sex has a significant effect on savings of small farmers and according to their results; male farmers were found to have the propensity to save as opposed to female farmers.

Gedela (2012)'s study on determinants of savings behaviour in rural and urban households provided the result that is in line with that of Odoemenem *et al*. (2013) by stating that the saving behaviour of males is better than that of females and the reason behind this is the fact that males, unlike women, men were given the opportunity to learn and acquire knowledge in the fields of financial knowledge, financial skills, and consumer practices while women were left behind.

2.6. Chapter summary

The purpose of this chapter was to provide an overview of what other authors discovered in their previous related studies. There are many studies concerning financial savings determinants and behaviour that were conducted internationally, yet there are limited studies about how the smallholder cash crop producers in South Africa handle their income and savings. The literature reviewed in this study is comprised of different studies concerning savings behaviours of individuals, households, farmers and cooperative members and because of the literature gab when it comes to smallholder cash crop farmers in South Africa, this study specifically addresses the savings determinants of smallholder farmer cash crop farmers in Polokwane local municipality of Limpopo province, South Africa. There are different contradictory motives of savings by different authors, and the difference is as a result of the different study areas and ultimately the different socio-economic characteristics thereof. Most authors found determinants such as: income, farming experience and

education as the significant factors affecting the ability to save. More determinants that were identified by these authors such as household size, financial literacy, farming experience, propensity to save, background area, age and gender were found to be in line and sometimes contradictory by different authors and they are discussed in this literature review.

CHAPTER THREE
METHODOLOGY

3.1. Introduction

This chapter provides an overview of the methods used for carrying out this research projects in the beginning of this chapter, the study area where the research was carried out is described and this is aimed at explaining the area in which the respondents of this study are from. The data set which comprises of research design and sampling technique is explained in this chapter. Further, the chapter provides information on the ethical considerations of this study, the analytical techniques used as well as a brief explanation of the limitations of this study.

3.2. Study area

Polokwane Local Municipality is located within the Capricorn District in the Limpopo Province of South Africa. This municipality is the small local municipality which borders the municipalities of Molemole, Greater Tzaneen, Lepelle-Nkumpi, Mogalakwena and Aganang and it accounts for 3% of the province. However, regardless of the size of the municipality, over 10% of the population of Limpopo resides within its boundaries since this municipality has the highest population density in the Capricorn District and serves as the economic hub. Polokwane local municipality ‘s geographical area is dominated by the rural areas whereby a large piece of land is under traditional authority. This local municipality is 23% urbanized and 71% rural, the largest group within the municipality resides in rural tribal villages (Census, 2011).

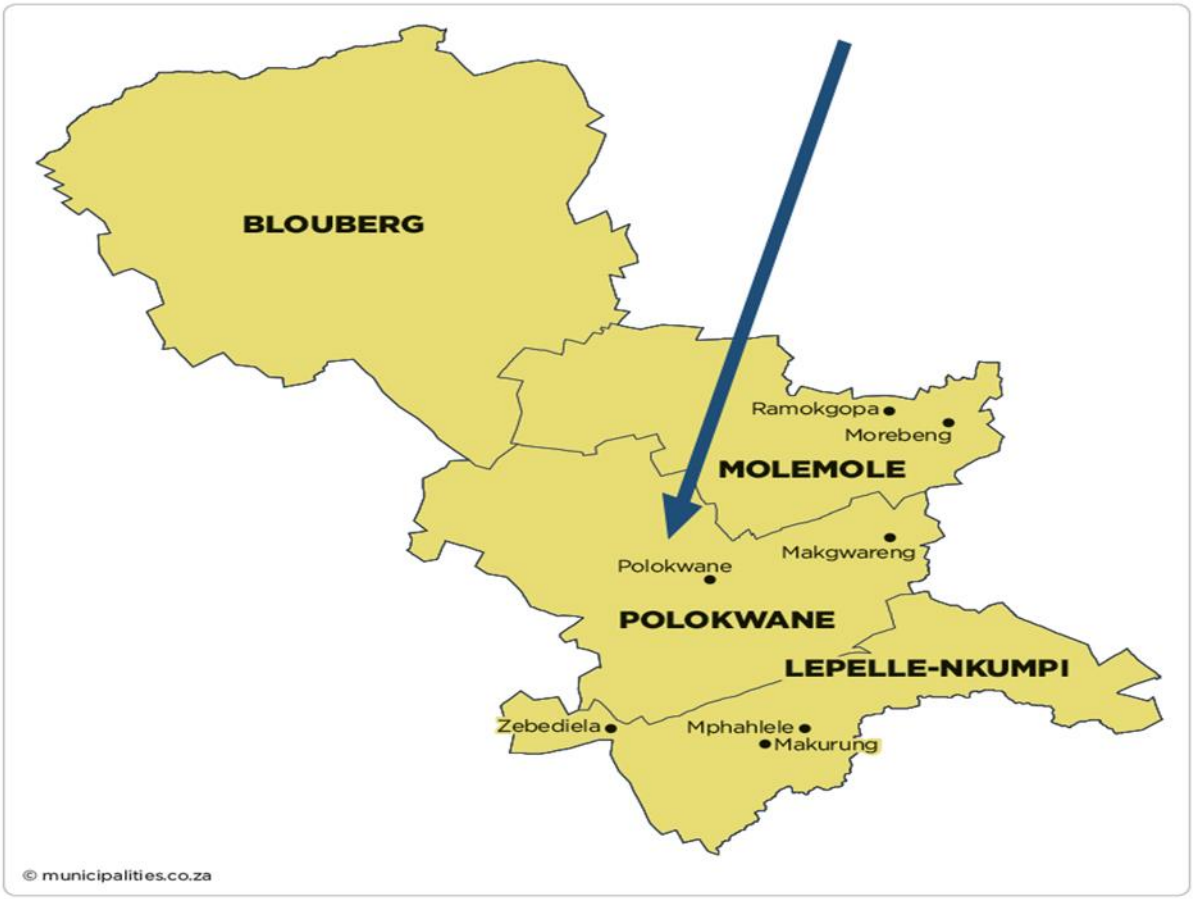


Figure 3.1: Map of Polokwane local municipality
Source: Municipalities of South Africa, 2017
https://municipalities.co.za/map/1121/polokwane-local-municipality

3.3. Data set

3.3.1. Research design

This study used primary cross-sectional data where the researcher collected data through direct encounters using the structured questionnaire as the main tool. The structured questionnaire was divided into two parts, the first part covered the socio-economic characteristics of the farmers as well as their most preferred cash crops while the second part addressed factors that influence and those that mitigate against savings.

3.3.2. Sampling

A non-probability sampling technique called purposive sampling was used in this study. According to Etikan *et al.* (2016), the purposive sampling technique is a technique chosen based on the study objectives and in this study only cash crop farmers in Polokwane local municipality were being selected as respondents without including any other farmer who is not a smallholder cash crop farmer in Polokwane. This, therefore, makes the purposive sampling technique the most suitable technique since the target was only the smallholder cash crop farmers in the study area. The participation of smallholder cash crop farmers from Polokwane local municipality was solely based on their willingness to participate in this study. Seventy (70) smallholder cash crop farmers participated as respondents for this study and were used as a reflection to represent the rest of the population.

3.4. Ethical considerations

The study adhered to the Turfloop Research Ethics Committee (TREC)'s rules and regulations and a certificate of ethics clearance was granted before the data collection. This study did not cause any harm to anyone and was strictly respectful enough to consider ethical issues such as: confidentiality, permission, inform consent, respect and danger or risk involved in participating in this study. Respondents only participated voluntarily in this study and were informed of their right/willingness to choose whether to participate in the research study or not. There were also no incentives to encourage the respondents to participate. They only participated because they wanted to form part of the research project that will voice out the challenges and benefits, they face in their farming activities.

3.5. Analytical techniques

3.5.1. Descriptive statistics such as: frequencies, means, tables and percentages are used to describe the socio-economic characteristics of the smallholder cash crop farmers (objective 1), the cash crops grown by the smallholder cash crop farmers (objective 2). And the constraints that militated against savings of smallholder farmers (objective 4) in the study.

3.5.2. Binary logistic regression model was employed to analyze the factors influencing savings of the smallholder farmers (objective 3). The binary logistic regression model is a statistical technique whereby the probability of a dichotomous outcome is related to a number of independent variables (Xue-Feng *et al.,* 2007). According to Otieno (2013), the discrete dependent variable renders the employment of binary logit model most appropriate and in this study.

a) General model

$$\frac{\log(pi)}{1-pi} = \beta_0 + \beta_i \sum x_i + \mu_t$$

The binary dependent variable Yi takes the value of 1 and 0. Y =1 if the farmer is saving and Y=0 if otherwise. β_0 is the intercept, β_1 ……β_n are estimated parameters, X_1 ……X_n are independent variables and μt is the error term.

The dependent variable (savings) in this study is represented as the ratio of the farm income that the smallholder cash crop farmers can put aside and not use in consumption or in current operating expenses.

Saving = Farming income – consumption and operating expenses.

S=I-C

Therefore, if the farmer saves (Y =1) then it means that they have a proportion of income which is not used in consumption or operations. If the farmer does not save (Y =0) which means that they do not have a proportion of income which is not used in consumption or operations and as a result, it is concluded that they consume all their earnings.

The identified independent variables that affect savings (dependent variable) in this study are influenced by previous literature and observation. These variables are: sex , age, marital status, household size, education level, financial literacy, farm size, farming experience, farm income, membership in a cooperative or association, access to credit, profit, access to saving information, access to extension service, market access, willingness to save and ownership of farm bank accounts.

b) Model specification

Fitting the variables into the model, the formula is represented as follows:

$$\text{Saving/otherwise} = \beta_0 + \beta_1 \text{SEX} + \beta_2 \text{AGE} + \beta_3 \text{MS} + \beta_4 \text{HS} + \beta_5 \text{EL} + \beta_6 \text{FL} + \beta_7 \text{FS} + \beta_8 \text{FE} + \beta_9 \text{FI} + \beta_{10} \text{MC/A} + \beta_{11} \text{AC} + \beta_{12} \text{P} + \beta_{13} \text{AS} + \beta_{14} \text{AE} + \beta_{15} \text{MA} + \beta_{16} \text{WS} + \beta_{17} \text{BA} + \mu_t$$

c) Table describing variables

CODE	DEPENDENT VARIABLE	DESCRIPTION	MEASUREMENT
SAV	Savings	1, if the farmer saves 0, otherwise	Dummy
CODE	**INDEPENDENT VARIABLES**	**DESCRIPTION**	**MEASUREMENT**
SEX	Sex	1, female. 0, otherwise	Dummy
AGE	Age	Age of the farmer	Years
MS	Marital status	1, farmer is married. 0, otherwise.	Dummy
HS	Household size	Total number of household members	Number of people
EL	Education level	Number of years spent in school	Continuous
FL	Financial literacy	1, farmer is financially literate. 0, otherwise.	Dummy
FS	Farm size	Numbers of hectares of the farm	Hectares
FE	Farming experience	Number of years spent in farming	Years
FI	Farm income	Annual income made from farming	Rands
MC/A	Membership in a cooperative or association	1, if farmer is a member 0, otherwise	Dummy
AC	Access to credit	1, farmer has access. 0, otherwise	Dummy
P	Profit	1, farmer generates profit 0, otherwise	Dummy
AS	Access to saving information	1, farmer has access to saving information. 0, otherwise	Dummy
AE	Access to extension service	1, farmer has extension service contact.0, otherwise	Dummy

MA	Market access	1, farmer has access to market. 0, otherwise	Dummy
WS	Willingness to save	1, farmer is willing to save part of their income. 0, otherwise	Dummy
BA	Ownership of farm bank account	1, farmer has farm bank account. 0, otherwise	Dummy

Table 3.1: Table describing variables

3.6. Limitations of the study

There are about 120 smallholder cash crop farmers in the study area and only 70 participated in this study. This is mainly because the participation of smallholder cash crop farmers from Polokwane local municipality was solely based on their willingness to participate in this study. Data were collected from 19 March 2020 before the Covid-19 pandemic hit South Africa through to June when South Africa was on level 3 lockdown due to the covid-19 pandemic. As a result, when collecting data and asking farmers to participate in the study, most farmers preferred social distancing during the question-and-answer activities with the researcher, while others were unwilling to participate.

There were also delays since the researcher could not collect data during levels 5 and 4 of the lockdowns. When the process of data collection resumed in June (level 3 lockdown), the fear and uncertainty concerning Covid-19 limited the sample size. Nevertheless, there were farmers who believed in research and were willing to participate. This study focused only on the precautionary motive to save, and there could be other reasons as to why do smallholder cash crop farmers save. Focusing on the precautionary motive restricted the respondents to only look at their fear for risks only when answering the questionnaire and commenting on their views towards saving of the portion of the income they generate in their farming activities. However, this study is focused on the ability of farmers to rise after unforeseen circumstances hence the use of precautionary motive to save. According to Keynes, the precautionary motive is defined as the motive that is encouraged by the thought of possible uncertainties which may arise in the future (Nayak, 2013)

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents the results of this research project as a result of the data collection and analysis conducted. It therefore discusses the results and explains what they mean. This chapter includes the descriptive statistics and the empirical results. Statistical Package for Social Sciences (SPSS) was used to analyze the set objectives, and the result of the analysis is explained in this chapter to provide information on how smallholder cash crop farmers of Polokwane local municipality viewed cash crop farming and savings, their savings behavior and the factors that determine their savings. Microsoft Excel software was used for calculations, descriptive diagrams, and tables to provide the clearer report in this study.

4.2. Smallholder cash crop farmers' socio-economic characteristics

The socio-economic characteristics of the smallholder cash crop farmers in Polokwane local municipality are discussed based on the variables sex, age, marital status, household size, education level, financial literacy, farm size, farming experience, membership in a cooperative or association, market access, ownership of farm bank account and access to extension service.

4.2.1. Sex

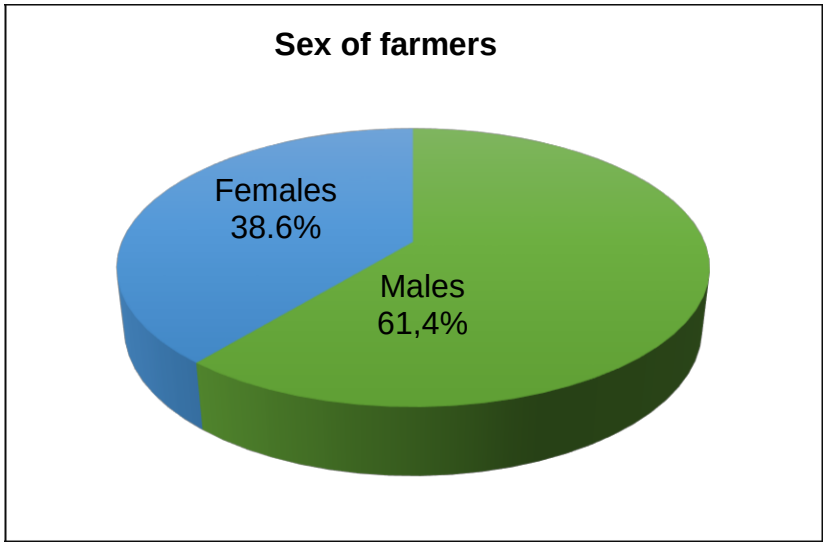


Figure 4.1: Sex of respondent

Based on the respondents in this study, 61,4% of them were males which is greater than the 38.6% of females. This tells us that more males are involved in the production of cash crops than females in the study area. This could be as a result of the fact that male farmers are more interested in producing cash crops since they are profit crops and not only for subsistence purposes than female farmers who usually farm for subsistence purposes in the area.

4.2.2. Age

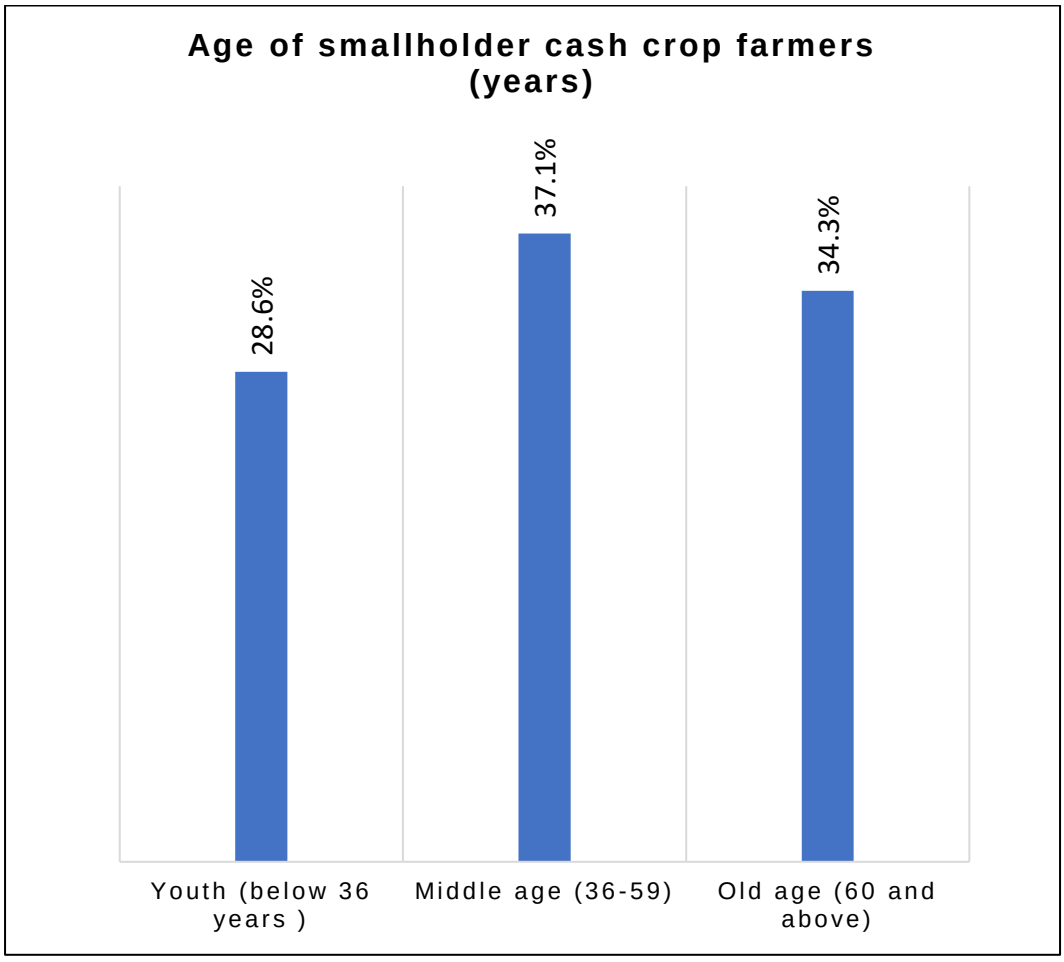


Figure 4.2: Age of farmers

The sampled smallholder cash crop farmers in Polokwane Local Municipality show that 28.6% of these farmers were the youths (below 36 years of age). Those that fell within the middle age group (36-59 years of age) accounted for 37.1%. Lastly, 34.3% of the cash crop farmers were found to be falling within the category of the old age group (60 years and above). The implication of these findings is that the majority of

the cash crop farmers where the middle-aged group and old age group. This may be because the old-aged group is likely to have more experience in farming activities. However, the middle-aged group percentage in cash crop farming is greater than that of old-aged group probably because majority of the middle-aged group are into farming because of business as compared to the old age group. The percentage of youth into cash crop farming remain less probably because of the less participation of young people in agriculture.

4.2.3. Marital status

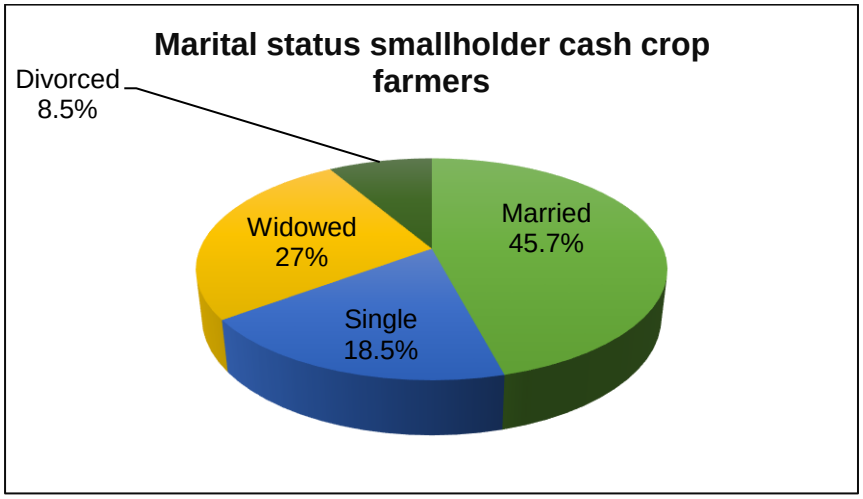


Figure 4.3: Marital status

Data analysis showed that 45.7% of the respondents were married, 18.5% were single, 27% were widowed, and 8.5% were divorced. This could imply that most of the farmers were married. When farmers are married, they are more likely to use family labour and this could lead to more income for farmers as they incur fewer operational costs when comparing to farmers that employ external labour. More farm income could open more chances for the farmer to consider saving part of the income without consuming all that they make.

4.2.4. Household size

Number of household members	Frequency	%
1-3 members	32	45.7
4-6 members	33	47.2
6-9 members	5	7.1
Total	**70**	**100.0**
1	3	4.3
2	2	2.9
3	27	38.6
4	18	25.7
5	12	17.1
6	3	4.3
7	3	4.3
8	1	1.4
9	1	1.4

Table 4.1: household size

From the data collected, it was revealed that the smallholder cash crop farmers' households ranged up to nine household members. The results in table 4.1 above shows the results of the minimum household size is one and the maximum household size is nine. The households with members ranging from four to six are dominating, followed by the households with members raging from one to three. The dominance of smaller household sizes of smallholder cash crop farmers in Polokwane local municipality implies that they have fewer dependents, but these farmers will also have lesser benefits from family labour since they have smaller number of family members.

4.2.5. Educational level

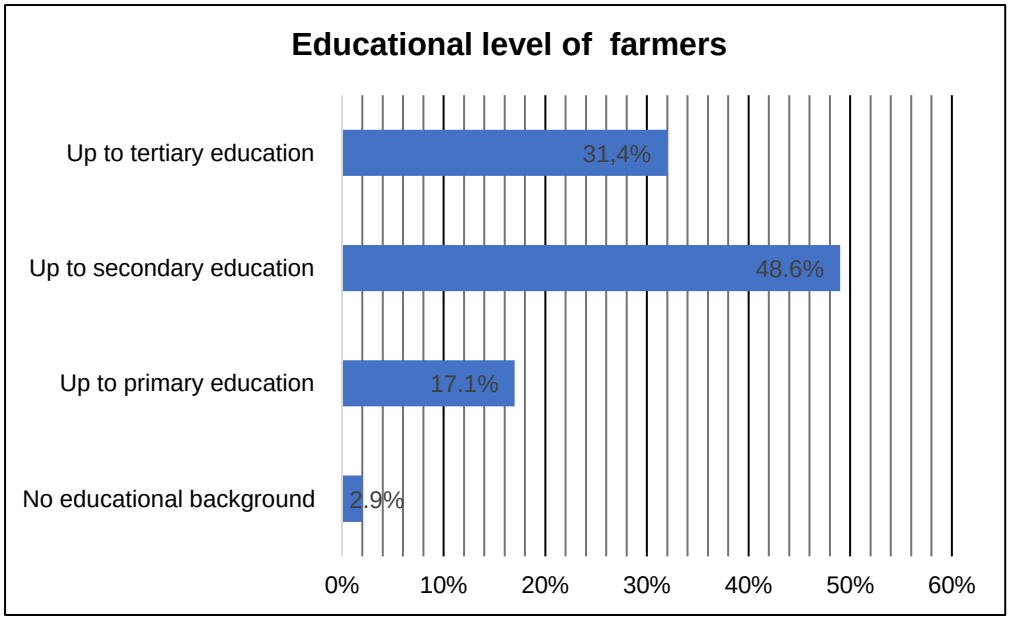


Figure 4.4: Educational level

The educational levels of Polokwane local municipality smallholder farmers range from having no educational level at all to a level where the farmers have tertiary education. The differences in these levels could be as a result of the differences in the age and background of the farmers. Through data analysis in this study, it is revealed that 2.9% of the farmers had no educational background, 17.1% of the farmers attended primary school and about 48.6% of the farmers attended secondary school while the 31.4% reported that they have tertiary education. The educational levels among the farmers had a great effect on the farmers view towards savings and reasons for saving.

4.2.6. Financial literacy

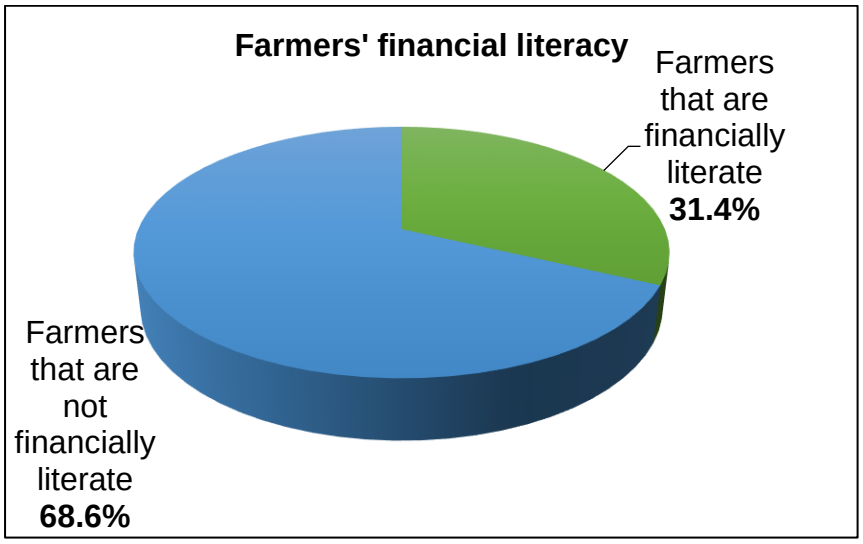


Figure 4.5: Financial literacy

From the data collected, 31.2% of farmers reported that they received some sort of financial education through their tertiary or secondary studies while the remaining 68.6% did not. Financial literacy in this instance referred to more than mathematics but being able to draw up financial statements such as budgets, income statements and balance sheets for their farms. Financial education that goes this far serves as an advantage for farmers because it is through understanding such statements that the farmer can know the net worth of their farms, be able to make good farm financial decisions, know if they are making profit and be able to reduce risks. When farmers are financially literate, they are more likely to save (Carpena *et al.,* 2011).

4.2.7. Farm size

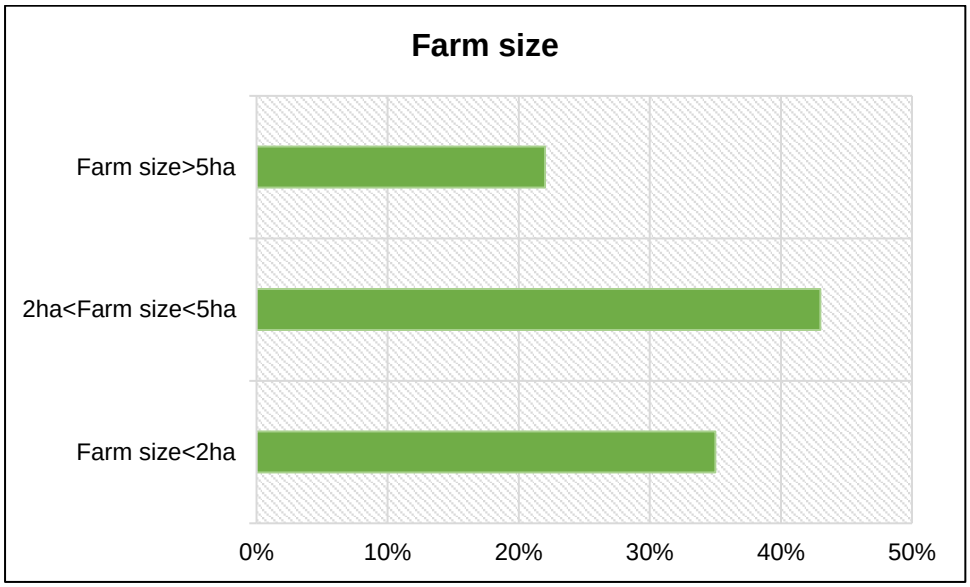


Figure 4.6: Farm size

The farm sizes of the smallholders in Polokwane are made of hectares that range up to 10 hectares. It is found that 21.4% percent of the farmers that participated in the study operated on a farm size that is greater than five (farm size> 5ha) hectares while 42.8% of farmers operated on farm sizes between two (2) hectares and (5) five hectares (2<farm size>5) and 35.7% of the farmers are operating on a farm sizes that are less than two hectares (farm size<2ha).It is seen through the percentages that the majority of smallholder cash crop farmers have smaller farm sizes, since most farmers produce on land sizes less than five (5) hectares. The assumption is that farmers operating on larger farm sizes are more likely to have larger produce, more income and therefore have the potential to save.

4.2.8. Farming experience

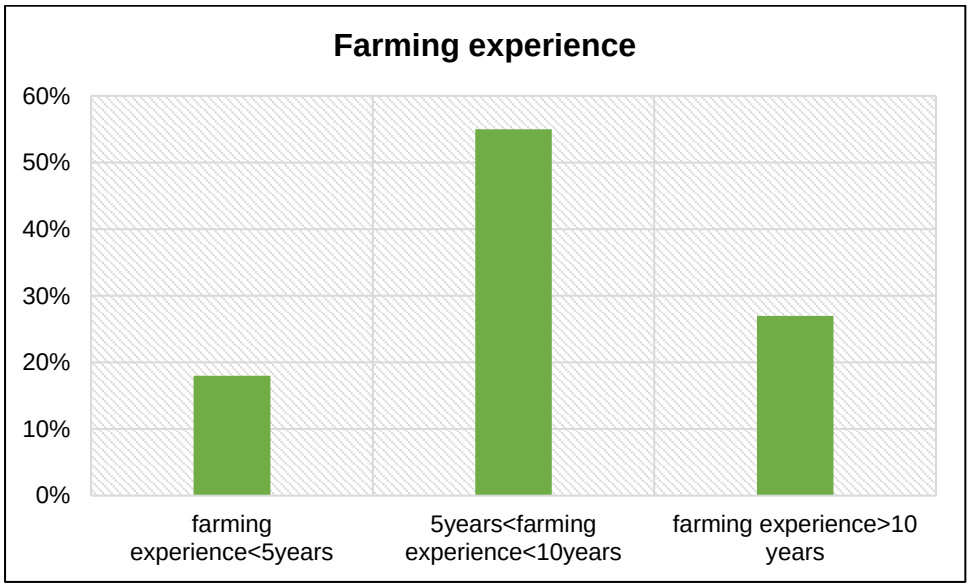


Figure 4.7: Farming experience

The categories of farming experience in this study are less than 5 years' experience (farming experience<5years), between five- and ten-years' experience (5<farming experience<10years) and lastly more than ten years farming experience (farming experience>10 years). According to the responses of the farmers who participated in this study, it was then revealed that 18.6% of smallholder farmers in Polokwane Local Municipality had up to five years farming and the farmers who had farming experience that ranged from five to ten years accounted for 54.3% while the remaining 27.1% accounts for the farmers whose farming experience is above 10 years.

4.2.10. Membership in a cooperative or association

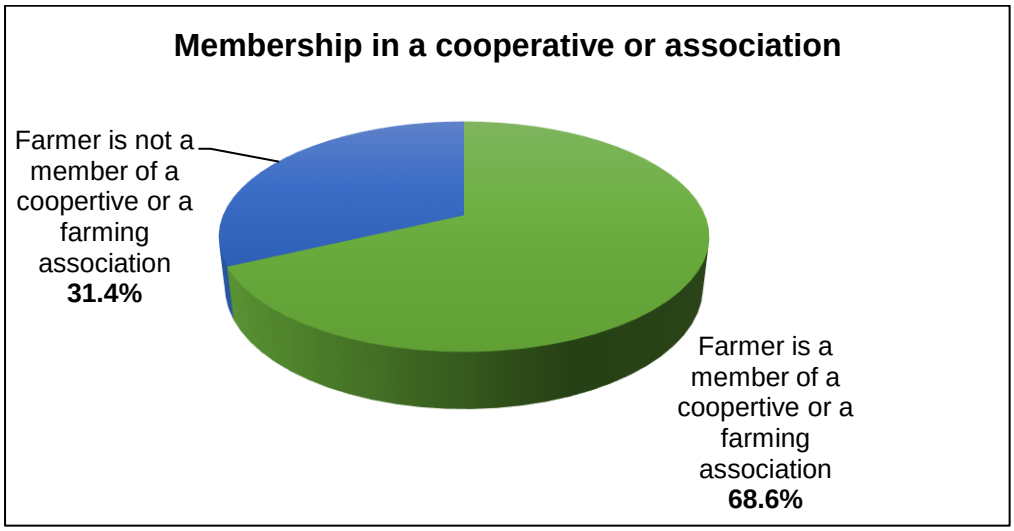


Figure 4.8: Membership in a cooperative or association

From the analysis conducted, it is revealed that 68.6% of smallholder cash crop farmers in Polokwane local municipality belonged to a farmer cooperative while 31.4% did not belong to any farmer cooperative or farming association group. There is an assumed advantage for the members of the cooperative or any farming association group to have a better perspective towards saving as compared to farmers who do not form part of any group association or cooperative since farmers that belong to groups are more likely to be goal driven, be exposed to saving information and encouraged to overcome risks by group members by having savings. Some cooperatives and associations also have saving schemes and such schemes have a potential to improve farmer views towards the farm financial savings.

4.2.12. Access to extension service

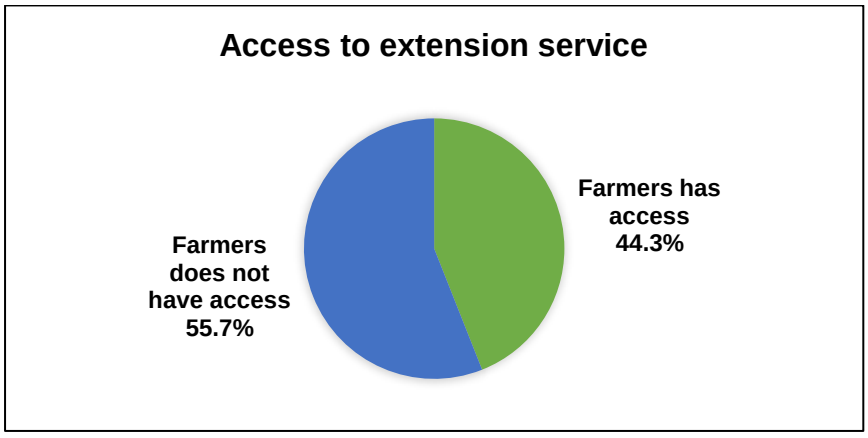


Figure 4.9: Access to extension service

Access to extension services in this study denotes the availability of the extension worker to the smallholder cash crop farmers and not necessarily the existence of an extension office in the area. Extension officers are available in the municipality but their availability as the smallholder cash crop farmers is limited. The percentage of smallholder cash crop farmers that actually have access to extension services is 44,3 whereas 55,7 percent of the farmers do not have access. Extension officers and their services are necessary as they act as a source of essential information providers to farmers. This is an implication that extension services providers could be the source for farmers to access information about savings, the benefits and how the save from their farm income.

4.2.15. Market access

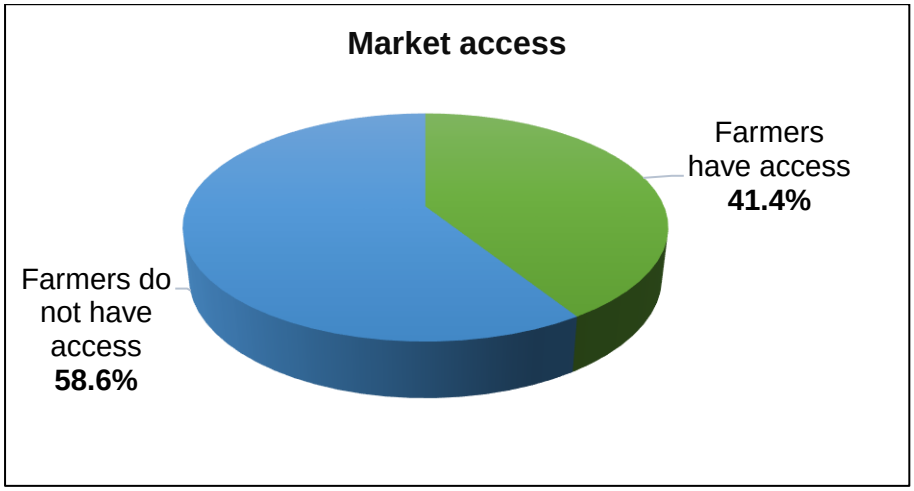


Figure 4.10: Market Access

Market access denotes the amount of ability of the smallholder cash crop farmers in Polokwane local municipality to access the bigger markets and participate in bigger market rather than producing to sell for surrounding households which are near the farms. Only 41.4% of the smallholder cash crop farmers have access to the bigger market whereas 58.6% farmers do not this resulted in lower incomes for farmers in who cannot access the bigger market because they have to settle for lowest prices possible in order to avoid the perishability of their crops.

4.2.16. Ownership of farm bank account

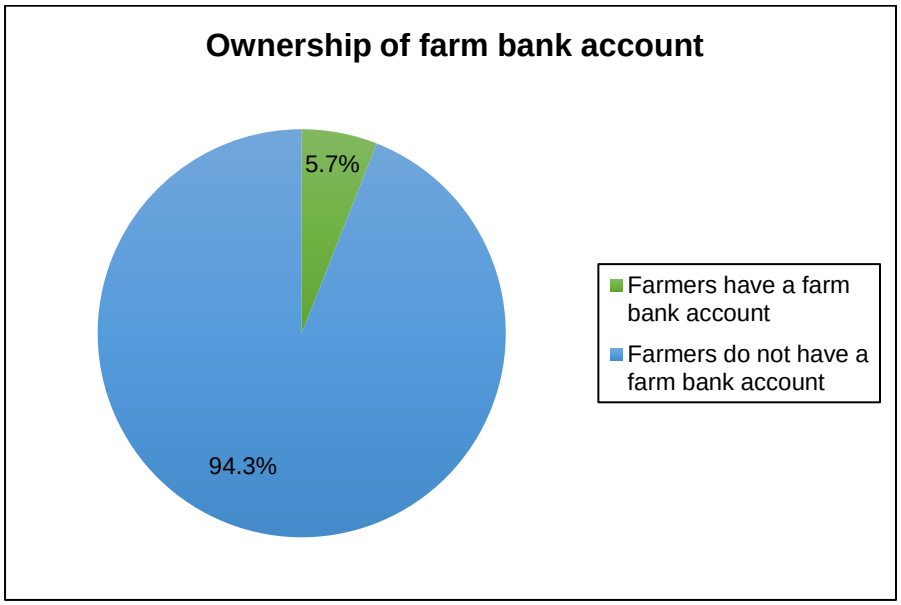


Figure 4.11: Ownership of farm bank account

Smallholder cash crop farmers displayed their awareness about the existence of banks. However, not all farmers own a farming enterprise bank account. It was revealed that only 5.7% of the farmers had a business bank account that is meant for management of the farm income, farm savings as well as farm investments while the remaining 94.3% did not. It was also discovered that most farmers use their own savings account to keep the farming income, this way, they mixed their personal savings with farm income. It is likely that these farmers use all the income they get for consumption and operating costs such as inputs and maintenance without saving for unforeseen circumstances.

4.3. Cash crops preferred by the smallholder cash crop farmers

Smallholder cash crop farmers in Polokwane local municipality have identified a number of cash crops they grow in their farming systems. The list included maize, spinach, tomatoes, ground nuts, cabbages, beetroots, butternuts, cabbage potatoes, carrots, etc. The most preferred cash crops by the smallholder cash crop farmers in the study area amongst the ones listed are maize, potatoes, tomatoes, spinach, cabbage, butternut, and groundnuts. Some farmers produce two or three cash crops rotationally. It is mentioned that the purpose of rotationally producing different cash crops is to protect and recover their soils, avoid pests, and ensure consistency in income as the different cash crops are profitable in different seasons. Vegetable cash

crops like spinach are preferred mostly because of their long-term season, a farmer can generate profit from spinach for about 8 months in a single year. It is therefore discovered that profitable cash crops that last for longer seasons are mostly preferred by the farmers who grow crops mainly to generate profit.

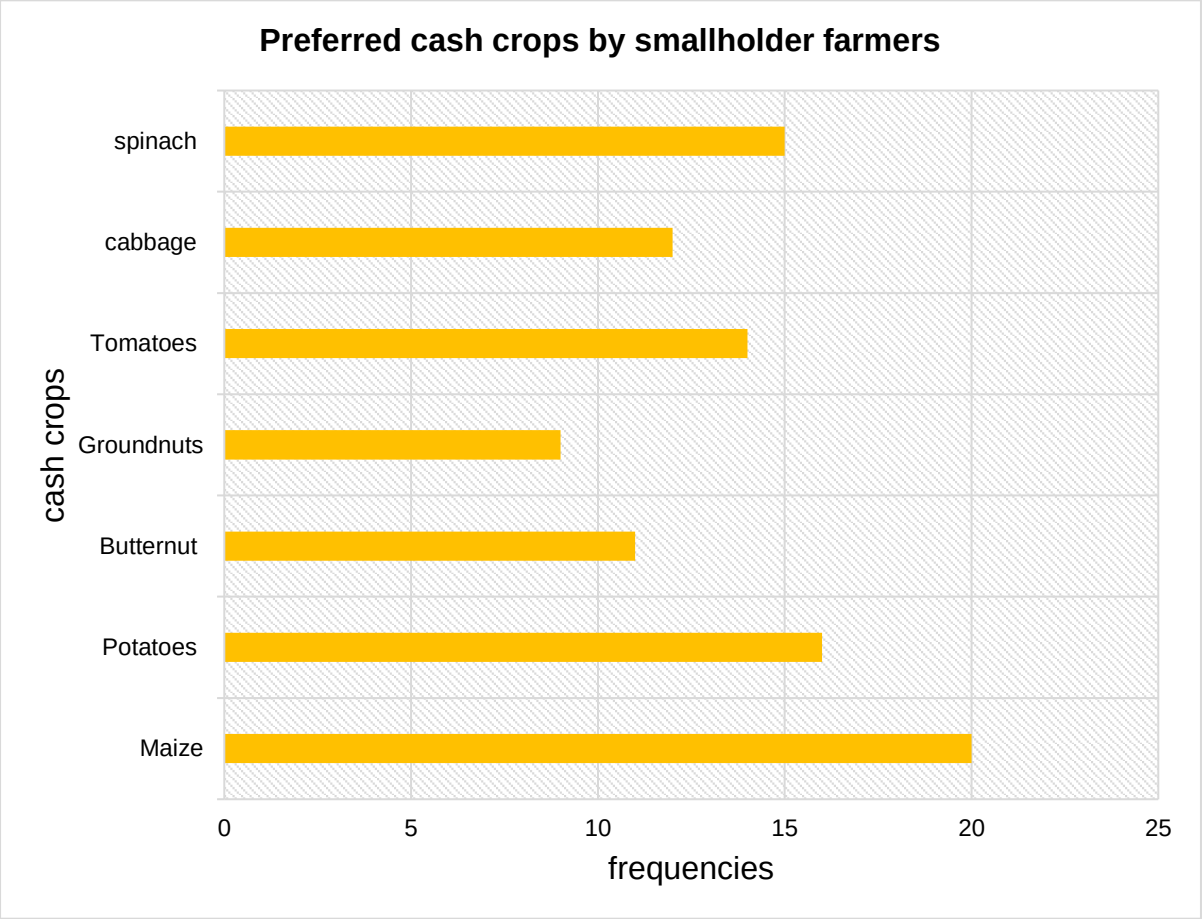


Figure 4.12: Preferred cash crops by smallholder farmers in the area

4.4. Determinants of savings among smallholder cash crop farmers

Binary logistic regression model was used to analyse the data obtained from 70 smallholder cash crop farmers who were interviewed by means of a structured questionnaire as discussed in chapter 3, (See also Appendix A).

Table 4.2 below provides the summary of the results of the binary logistic regression coefficients of savings determinants of smallholder cash crop farmers.

Table 4.2: Results from the binary logistic regression model

	Coefficient	Standard error	Wald	Significance (p-Value)
Sex	0.688	1.332	0.156	0.605
Age	0.148	0.092	1.608	0.109
Educational level	-0.721	0.641	1.125	0.261
Marital status	1.633	2.342	0.697	0.486
Farm income	1.885**	0.961	1.961	0.050
Farming experience	-0.135	0.997	0.135	0.892
Access to credit	-0.338	0.419	0.807	0.420
Marital status	0.819	1.178	0.695	0.487
Access to credit	0.138	0.081	1.708	0.104
Access to saving information	-0.821	0.631	1.112	0.271
Access to extension services	1.833	2.452	0.665	0.586
Market access	-0.238	0.427	0.701	0.520
Ownership of bank account	0.819	1.168	0.595	0.887
Household size	-4.618**	1.870	2.470	0.014
Farm size	3.551**	1.760	2.018	0.044
Membership of a cooperative/ association	-0.098**	0.041	2.389	0.018
Financial literacy	0.073303**	0.040	2.824	0.048
Constant	-7.690	4.967	1.548	0.122

***1% level of significance, **5% level of significance and *10% level of significance

Table 4.3: Model summary

Summary		
N (sample size)	70	
-2 Log Likelihood	29.636	
Cox & Snell square	0.621	
Negelkereke R Square	0.871	

Table 4.2 Presents the results from the binary logistic regression model. The coefficient values measure the expected change in the dependent variable (Y) for a unit change in the computed regression line and it is used to check the accuracy of predictions made with the regression line.

The univariate Wald test compares the difference between a maximum likelihood point estimate of a single parameter and a hypothesised value to its standard error. The Wald is obtained by the following formula: Wald = (estimate – hypothesised value)/ Standard error of the estimate. If the value of the Wald is 1.96 and greater, then the results are significant.

Table 4.3 shows the model summary where the -2log likelihood is 29.636, and it shows how strongly the model predicted the regressor variables, the smaller the -2log likelihood, the better the model. The Cox and Snell is 0.621 and it is based on the log likelihood for the model compared to the log likelihood for a baseline model (Cox, 2018). However, with categorical outcomes, it has a theoretical maximum value of less than 1. Nagelkerke is 0.871 and it is an adjusted version of the Cox & Snell R-square that adjusts the scale of the statistic to cover the full range from 0 to 1.

4.4.1. Statistically significant variables

Out of the seventeen explanatory variables that were identified as potential variables that could affect the farmers' savings as a result of previous studies and empirical outcomes of other researchers, only five of these variables were found to be statistically significant when it comes to the savings of smallholder cash crop farmers in Polokwane local municipality. The farm income, household size, farm size, membership in a cooperative or association and financial literacy of these smallholder cash crop farmers are the five variables that were found to be statistically significant while the other twelve variables where found to be insignificant in this study.

4.4.1.1. Farm income

Farm income was found to be positively and statistically significant ($p<0.050$) at the 5% level of significance. Meaning that there is a positive relationship between farm income and savings and the unit increase in the farm income increases the probability of the farmer being able to save. The implication is that the more the farm income, the more likely the farmer's ability to save. Obalola, Audu and Danilola (2018) acknowledged that farming income is an important variable determining the savings by farmers and stated that the higher the farm income the farmer generates, the more likely a farmer would save or accumulate capital to meet investment demands. This further agrees with the study of Odoemenem *et al.,* (2013) who revealed that income is one of the major determinants of saving and has a direct influence on the savings of the small-scale farmers, they stated that increase in the income of a farmer will lead to savings.

4.4.1.2. Household size

Household size was found to be negatively and statistically significant ($p<0.014$) at the 5% level of significance. Meaning that the relationship between the household size and savings is negative and the unit increase in the household size reduces the probability of the farmer from saving. This finding is in line with the findings of Mamman (2018) that the household size of the smallholder farmers has a negative influence on the savings capacity of the respondents and was statistically significant at 10%. Therefore, the larger the household size, the smaller the amount of savings by the farmer. The reason behind this could be that when a farmer has the larger household, he/she has more members depending on the farm income. This therefore militates

against their ability to save from that farm income because the larger proportions of the farmers income; is consumed in the household instead of being kept aside for savings. It is harder for farmers who have more dependents to have surplus income which can be allocated as savings.

4.4.1.3. Farm size

The farm size of these smallholder cash crop farmers was found to be positively and statistically significant ($p<0.044$) at the 5% level of significance. Meaning that there is a positive relationship between the size of the farm the farmer owns and produce crops on and the savings. Therefore, the unit increase in the size of the farm the farmer owns and produce crops on increases the probability of the farmer to save form the income they generate. The implication here is that farmers who own bigger farms are more likely to save. This outcome follows the findings of Mamman (2018); Orebiyi and Fakayode (2005) as cited by Tesfamariam (2012) who in their studies also found out that the farm size of the smallholder farmers has a positive influence on the savings capacity of the farmer and this means that the larger the farm size, the higher the farmers' potential to save as large sized farms means more income for the farmer. Therefore, it can be concluded that farmers with bigger farm sizes utilize the larger farm size to grow and nurture their crops and make more profit than the farmers with smaller farm sizes and as a result, the greater potential to save as it is already been discovered that the income has the positive influence on savings.

4.4.1.4. Membership in a cooperative or association

Membership of the farmer in a cooperative or association was found to be negatively and statistically significant ($p=0.018$) at the 5% level of significance. Meaning that the relationship between the membership in a cooperative/association and savings is negative and the farmers' membership in a cooperative/association reduces the probability of the farmer from saving. These results are astonishing because the positive effect of this variable was expected on savings. It was expected that the membership in a cooperative or association by a farmer will result in the increase in the probability of saving by the farmer. The expectation was from the notion that farmers that form part of a corporative or association are exposed to information that benefit their farming businesses and savings benefits is one of them. Unfortunately, the results of the analysis in this study do not agree with the notion. It can therefore be deducted that the negative relationship is caused by a high number of farmers who

are part of cooperatives or associations but do not save due to the fact that they rely on such groups to assist them in times of risks and loss in their farming activities. It can therefore be deducted that farmers that belong to cooperatives and associations are too reliant on such groups and are not independent enough to consider farm savings and the groups do not encourage them to save.

4.4.1.5. Financial literacy

The financial literacy acquired by the smallholder cash crop farmer was found to be positively and statistically significant ($p<0.048$) at the 5% level of significance. This means that there is a positive relationship between the farmers' financial literacy and saving and the unit increase in the financial literacy increases the probability of the farmer having the potential to save. The implication is that, the more financially educated the farmer is, the more likely will the farmer know the importance and potential benefits of saving and ultimately want to save. Ebissa and Kassie (2017); Carpena *et al.,* (2011) acknowledged that financial literacy is an important variable determining the savings by farmers regardless of the level of education and the results of this study follows their findings in that, the level of education was found to be insignificant while the specific financial literacy was found to be positively and statistically significant when it comes to savings. Those that have financial planning in the study of Ebissa and Kassie (2017) where found to be more likely to save and According to Carpena *et al*., (2011), financial illiteracy may prevent individuals from opening accounts as they may be lacking the knowledge about the benefits of formal saving.

4.4.2. The insignificant variables

The variables sex, age, marital status, education level, farming experience, access to credit, profit, access to savings information, access to extension service, market access, willingness to save and ownership of farm bank account were found to be insignificant. There are previous studies where these variables were found to be statistically significant as discussed in the literature review. However, these variables are not relevant enough to affect savings by smallholder cash crop farmers hence their insignificancy. Variables like access to credit and extension services where expected to be significant as they are in the previous studies and they are insignificant in this study probably because only a group of farmers who have no access to credit and

have limited access to extension services participated in this study and it is not clear how the two variables affect their income and savings abilities.

4.5. Constraints to savings of among smallholder farmers.

Smallholder cash crop farmers show interest in savings but do not save. Out of the 70 farmers who participated in the study, 100% of them agreed that saving is important in a farming business but only 20% (14 farmers) indeed save through cooperatives and both personal and the bank accounts while only 4 farmers of the group owned farm business banking accounts. Four (4) major constrains that militated against savings by smallholder cash crop farmers were identified and these constraints are the farmers' farm income, the cost of their labour, financial illiteracy and banking costs.

4.5.1. Farm income

The key constraint identified by the smallholder cash crop farmers in Polokwane local municipality is lower income generation. Regardless of how they put efforts in producing the quality crops they can never sell at the higher price than the one that is already in the market because their main market is the people around the residential areas who actually settle for cheaper crops from the super markets without taking into account the level of quality . Farmers are therefore, compelled to sell at the lowest possible market price because they want to avoid loss since their major crops are easily perishable. As a result, these farmers find themselves generating lower incomes than what they had anticipated earlier before growing the crops.

4.5.2. Cost of labour

Smallholder cash crop farmers in Polokwane local municipality are dominantly relying on family labour and if the members of the family have other commitments outside the farm, such as school, work; farmers have to hire extra labour and the labour may be seen as cheap but they undoubtably take a larger portion of the farmers' income. The farmers are always remaining only with enough just to sustain the farm by purchasing inputs and enough to contribute to their households with nothing extra that is available for them to be able to keep aside for savings.

4.5.3. Financial illiteracy and banking costs

A very small percentage of smallholder cash crop farmers own business (farm) bank accounts in Polokwane local municipality (see figure 4.11). Most farmers showed no interest in owning a business account for their farms. Most of them are financially illiterate and see no benefit in bank accounts. This is in line with what Carpena *et al*., (2011) stated in their study, that financial illiteracy may prevent individuals from opening accounts due to lack of familiarity with account-opening procedures or at times it may be the lack of knowledge about the benefits of formal savings.

Farmers that were identified to have financial knowledge explained how banking costs affect their ability to save, they stated in their responses that banking costs of small business accounts are high, the monthly payments are over R80.00 and for them, it means a portion of their monthly sales given that their crops are seasonal and do not guarantee sales on a monthly basis but on the harvest and selling period. The benefits of owning a business account cannot merge the costs they incur, since their customers usually use cash payment methods for the produce leaving the farmer solely responsible for making deposits in to the bank which may be time consuming and costly for the farmer. Other banking costs include travels to the banking institutions and access to internet for cellphone banking. Cellphone banking seems to be a major concern because majority of the old age farmers do not own smart phones and those that own them do not know how to use them.

4.5. Chapter summary

This chapter is made of results that present savings determinants of smallholder cash crop farmers in Polokwane local municipality according to the set objectives of this study. The findings of the study are thoroughly outlined from the use of different approaches. The socio- economic characteristics of the smallholder cash crop farmers in the stud area and the most preferred cash crops in the study area are described using tables, graphs, and charts. Further, the discussion of factors that militate against savings are discussed as challenges that affect farmers' ability to save. Lastly, the factors that affect savings by smallholder cash crops are outlined in this chapter, showing the significant, the insignificant variables and at what level do the significant variables affect savings as per results of the binary logistic regression model.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter covers the overall summary of the research findings, the conclusion drawn from the findings and the literature reviewed, as well as the recommendations. The information about the achievement of the objectives of this study is outlined in this chapter. The chapter provides information of whether the set objectives are adequately achieved or not and if the research questions were answered or not answered. The answers to the research questions are concluded in this chapter. There are also recommendations after the findings and conclusion of this study and these recommendations are directed to the smallholder cash crop farmers, policy makers as well as researchers as practical suggestions to solutions of the identified problems of this study in the study area.

5.2. Summary of findings

The study was conducted in Polokwane Local municipality, in the Capricorn District within Limpopo Province of South Africa. The aim of this study was to analyze the savings determinants among smallholder cash crop farmers in Polokwane local municipality of Capricorn district in Limpopo province of South Africa. The objectives of this study were to identify and describe the socio-economic characteristics of smallholder cash crop farmers in the study area, to identify the most preferred cash crops grown by the smallholder cash crop farmers in the study area, to determine the factors that influence savings by the smallholder cash crop farmers in the study area and lastly, identify and describe the constraints that militate against savings by the smallholder cash crop farmers in the study area.

Descriptive statistics was used to achieve the first, second and fourth objectives and the binary logistic regression model was employed to achieve the third objective. The results of the socio-economic characteristics of the respondent indicated that the majority of Polokwane smallholder cash crop farmers are males, and the ages varies from youth to adults over the age of 60 years. However, the population of these farmers is dominated by the middle-aged group of farmers. Most of them are married, and this is explained by the dominance of the middle-aged group of farmers and they

belong to households with memberships ranging from one to nine, but most households have four members. These farmers have different levels of education from no formal education to tertiary education and it is discovered that the majority of them have up to secondary school education while others also provided their level of financial literacy. Smallholder cash crop farmers in the study area dominantly farm on farm sizes less than five hectares, most have the farming experience of five to 10 years though there are others who have more farming experience than that of up to 10years. Most farmers form part of cooperatives, have limited access to extension workers, limited access to the bigger markets and do not own the farm business bank account.

The preferred cash crops grown by the smallholder cash crop farmers in the study area included maize, spinach, tomatoes, ground nuts, cabbages, butternuts, and potatoes. Farmers provided several reasons why they preferred the listed cash crops and the most dominating reason for the preference of some crops was their profitability and lasting for longer seasons.

Out of the seventeen explanatory variables that were identified as potential variables that could affect the farmers' savings as a result of previous studies and empirical outcomes of other researchers, only five of these variables were found to be statistically significant when it comes to the savings of smallholder cash crop farmers in Polokwane local municipality. The farm income, household size, farm size, membership in a cooperative or association and financial literacy of these smallholder cash crop farmers are the five variables that were found to be statistically significant. The smallholder cash crop farmers in the area identified four major constrains that militated against their savings and these constraints are their farm income, the cost of their labour, financial illiteracy and banking costs.

5.3. Conclusion

The savings determinants of smallholder cash crop farmers in Polokwane local municipality are provided in this study through addressing and answering the research questions of this study. The socio-economic characteristics of the smallholder cash crop farmers in the study area is made up of the dominance of male, middle aged farmers who are married and belong to smaller households. Their level of education ranges up to tertiary level, but most do not have farming bank accounts and their

financial literacy is limited. These smallholder cash crop farmers mostly grow cash crops on farm sizes ranging from two to five hectares, have over five years farming experience and belonged to farming cooperatives though they have limited access to extension services and the proper markets. The most preferred cash crops are maize, potatoes, tomatoes, butternut, and ground nuts. There is a positive relationship between savings and farm income, farm size and financial literacy. This means that the more the farm income, farm size and level of financial literacy the more likely the farmer's ability to save. There is a negative relationship between savings and household size and membership in a cooperative or association. This means that the higher household size reduces the probability of the farmer to save and the membership in cooperatives or farming association reduces the farmers probability to save. Although it was assumed that membership in a cooperative or farming association will encourage farmers' probability to save; it seems the cooperatives or farming associations encouraged the farmers to depend on loans and incentives they provide. Farmers rely on the incentives that the cooperatives or associations provide, and they are not encouraged to independently save the portion of their farm incomes. Constraints that militated against saving by smallholder cash crop farmers in the study area are their lower farm incomes, the high cost of their labour, financial illiteracy and banking costs.

5.4. Recommendations

5.4.1. Recommendations to smallholder cash crop farmers and policy makers

It is discovered precisely in this study and other previous studies that farmers saving ability, regardless of the farmers' intentions or willingness to save is highly dependent on the farmers income. So, strategies on how to improve farmers' income will ultimately play a role in the ability of farmers to save a portion of their income while being able to adequately cover current operating costs as well a necessary consumption.

- Smallholder cash crop farmers should consider diversification in order to attain a consistent farm income. Diversifying and producing almost every crop that is in demand in the market will improve farmers' income earning consistency. When farmers have consistent income, they will be able to have a financial plan

and be financially organized enough to be able to keep aside part of their farm income as savings for future use and unforeseen circumstances.

- Farm size has a positive influence on farmers savings. Smallholder cash crop farmers should consider using up all the hectares available in the farm to grow crops and all sorts of farming activities without leaving any piece of land unused.
- Farmer cooperatives do not necessarily influence savings as perceived in other studies. Farmers in this study area must not be too dependent on cooperatives or associations for all aspects of the farming business. They should exercise independency and seek for information about financial management and savings from different platforms like online sources, publications, financial and educational institutions. This level of independency will also improve their financial literacy and thereby the probability to save.
- It is discovered that household size negatively influences savings by smallholder cash crop farmers so to reduce this negative influence, these farmers must consider engaging in other off-farm activities that will generate income to support their households to avoid consuming all the farm income without keeping savings to buffer for unforeseen circumstances.
- Banking costs for small businesses are too high for smallholder farmers and it is difficult for them to maintain a farm business bank account. Policy makers need to draw up an adequate and comprehensive savings scheme that is inclusive for smallholder cash crop farmers and will motivate the farmers to save.
- Banking institutions should be approached and lower banking costs for small farm businesses should be considered.
- Extension services should include lessons about farm business savings, how to save from the farm income and the benefits thereof. Access by smallholder cash crop farmers to the extension workers in the study area should also be improved and made consistent.
- Providing access to automated inputs by smallholder farmers will reduce their unending need and cost of more labour and help farmers to save rather than spending most of their income on labour.

5.4.2. The recommendation for further studies

There in common are several international studies about smallholder farmers' ability to save but limited studies about the smallholder cash crop farmers in south Africa. Researchers should consider carrying out this study with the selected respondents being different cash crop farmers within all nine provinces of South Africa, compare their challenges and different socio-economic characteristics. This study focused only on the precautionary motive to save, and there could be other motives to save which may provide more reasons why smallholder cash crop farmers should save; further studies should consider other motives to save.

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Annexure 1: Questionnaire

FACULTY OF SCIENCE AND AGRICULTURE

SCHOOL OF AGRICULTURAL AND ENVIRONMENTAL SCIENCE

DEPARTMENT OF AGRICULTURAL ECONOMICS AND ANIMAL PRODUCTION

ANALYSIS OF SAVINGS' DETERMINANTS AMONG SMALLHOLDER CASH CROP FARMERS: A CASE STUDY OF POLOKWANE LOCAL MUNICIPALITY IN LIMPOPO PROVINCE SOUTH AFRICA

Summary of the study

As highlighted in the title above, the study is focused on the factors that determine the smallholder cash crop farmers' ability to save. This is because there are many smallholder farmers who produce cash crops but do not save some of their income to ensure stability. The study will also be looking at the factors that militate against farmers' savings as well as the most preferred cash crops in the study area.

Aim of the study: The aim of this study is to analyse the determinants of savings among smallholder cash crop farmers in Polokwane local municipality of Capricorn district in Limpopo province of South Africa.

The objectives of the study are to identify:

1. and describe the socio-economic characteristics of smallholder cash crop farmers in the study area.
2. the most preferred cash crops grown by the smallholder cash crop farmers in the study area.
3. and analyse the factors that influence savings by the smallholder cash crop farmers in the study area.

4. the constraints that militate against savings by the smallholder cash crop farmers in the study area

Consent to take part in the research

I…… (Respondent's name) voluntarily agree to participate in this research study and complete the questionnaire. I understand that I will not benefit directly from participating in this research and that all information I provide for this study will be treated confidentially. I understand that I am free to contact any of the people involved in the research to seek further clarification and information. I understand that even if I agree to participate now, I am allowed to withdraw at any time or refuse to answer any question.

Signature……...

Contacts: 0799785572/0813164611

Enumerator : _____

Respondent : _____

Questionnaire number : _____

Date : _____

Time : _____

Contact details : _____

Name of place : _____

Part one: socio economic characteristics information

Mark X in the box with the chosen option for the following questions and on the option for age and household size write a number:

1. Gender	Male	Female			
2. Age					
3. Educational level.	No formal education	Primary education	Secondary education	Tertiary education	
4. Farmer holds any form of financial literacy qualification	Yes	No			
5. Employment status	Unemployed	Public sector	Private sector	Self employed	Pensioner
6. Main source of income	Salary	Wages	Pension	Social grants	Remittances
7. Monthly income	R				
8. Ethic group	African	White	Coloured	Indian	Other
9. Marital status	Single	Married	Divorced	Widowed	
10. Religion	Christian	Muslim	African tradition	Other	
11. Farming experience	------- years				

Part two: information about the cash crops grown by the smallholder farmers in Polokwane Local Municipality and the farmers' savings behaviour

1. Cash crop grown and preference

1.1. Do you have certain crop(s) that you prefer to grow?

Yes	No

1.2. If yes; what is the most preferred crop(s)?_____

1.3. Which cash crop(s) do you grow in your farm?_____

2. Farm size

2.1. What is the size of your farm?_____ha

3. Experience in environmental shocks

3.1. Have you ever experienced loss through environmental catastrophes that damaged your production?

Yes	No

3.2. How severe was the damage?

Caused total loss	Mild loss

3.3. Where you able to recover?

Yes	No

3.4. If yes, what where the methods used to recover?

Explain:_____

_____

3.5. Where did you get the money to finance the recovery?

Savings	Loan	Farm income	Personal income	Other

Please specify other:_____

_____

4. Income

4.1. How much is the total income from the cash crops? R_____

4.2. How much is the surplus over farming expenditure? R_____

5. Savings

5.1. Do you **save** some of the farm profit/income made?

Yes	No

5.2. If yes, why? If no, why? _____

_____

_____ (*constraint*)

5.3. In your own opinion, why should a farmer save money from the income made? _____

_____

5.4. How do you save money from the income made from cash cropping?

Through a bank	Keep money at home	Through a cooperative	Through the stokvel	other

Please specify other: _____

_____

5.5. Do you make interests from the savings made?

Yes	No

5.6. If yes, how much are the interests? _____

5.7. Do you have access to saving information?

Yes	No

5.8. If yes, how did you access the savings information? _____

_____

_____

5.9. Do you have contact with extension workers?

Yes	No

If yes:

5.9.1. do they emphasize the importance of farm savings?	Yes	no
5.9.2. do they provide information on methods to save?	yes	no

6. Farmer performance

6.1. Tick yes or no

6.1.1. Do you have constant access to the market?	Yes	No
6.1.2. Do you receive assistance from any farmer support program?	Yes	No
6.1.3. Do you have access to credit or loan	Yes	No

6.2. Where do you sell your crops/ who are your main customers?

Retail shops	Households	Business organisations	other

Please specify other: _____

6.3. Do you qualify for farming credit from any lending institution?

Yes	No	Uncertain

----------Thank you----------

Annexure B: Approval for data collection

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
AGRICULTURE AND RURAL DEVELOPMENT

Ref: 12R
Enquiries: Dr T. Raphulu

Ms M.I. Marutha (201509299)
University of Limpopo

16 March 2020

RE: APPLICATION TO CARRY OUT RESEARCH UNDER THE DEPARTMENT OF AGRICULTURE & RURAL DEVELOPMENT IN POLOKWANE MUNICIPALITY.

1. Your letter/email of request for permission to do research has reference.
2. Kindly take note that your request to conduct research titled "Analysis of savings' determinants among smallholder cash crop farmers: a case study of Polokwane Local Municipality in Limpopo Province South Africa" has been granted.
3. You are required to visit the office of Deputy Director : Polokwane municipality to brief them on the study, to request smallholder cash crop farmers database and the assistance.
4. The Department is prepared to embark on any activity which could assist our smallholder farmers to improve their farming systems and production at large.
5. Kindly take note that you will be expected to hand over a copy of your final report to the Department for record purposes as well as for reporting. You may also be invited to share your findings in the Departmental Research Forum.
6. Hoping that you will find this in order.

Kind regards

Dr T. Raphulu
Chairperson: Research Committee

16/03/2020
Date

67/69 Biccard Street, POLOKWANE, 0700, Private Bag X9487, Polokwane, 0700
Tel: (015) 294 3135 Fax: (015) 294 4512 Website: http://www.lda.gov.za

Annexure C: Ethical clearance

University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 3935, Fax: (015) 268 2306, Email: anastasia.ngobe@ul.ac.za

TURFLOOP RESEARCH ETHICS COMMITTEE

ETHICS CLEARANCE CERTIFICATE

MEETING:	**05 February 2020**
PROJECT NUMBER:	**TREC/10/2020: PG**
PROJECT:	
Title:	Analysis of Savings' Determinants Among Smallholder Cash Crop Farmers: A Case Study of Polokwane Local Municipality in Limpopo Province South Africa
Researcher:	MI Marutha
Supervisor:	Prof IB Oluwatayo
Co-Supervisor/s:	Prof A Belete
School:	Agricultural and Environmental Sciences
Degree:	Master of Science in Agricultural Economics

PROF P MASOKO
CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: **REC-0310111-031**

Note:

i) **This Ethics Clearance Certificate will be valid for one (1) year, as from the abovementioned date. Application for annual renewal (or annual review) need to be received by TREC one month before lapse of this period.**

ii) **Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee, together with the Application for Amendment form.**

iii) **PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.**

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