Developing Entrepreneurship Framework for Improved Productivity and Financial Performance of Smallholder Agricultural Cooperatives

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Dissertation accepted in fulfilment of the requirements for the degree Master of Science in Agricultural Economics at the North West University

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Submission date: May 2023

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DECLARATION

I, Tebogo Percy Mangoejane, declare that the dissertation entitled "***Developing Entrepreneurship Framework for Improved Productivity and Financial Performance of Smallholder Agricultural Cooperatives***" is my work in design and execution and has not been submitted for any degree purposes at this or any other university. I declare that all materials and sources used or quoted in this work have been duly acknowledged by means of complete references. Moreover, I declaire that I am fully aware of the North West University's policy on plagiarism and I have taken every precaution to comply with the regulations.

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TEBOGO PERCY MANGOEJANE (25401009)

I, Tebogo Percy Mangoejane, student number (20401009), hereby declare that I am fully aware of the North West University's policy on research ethics and I have taken every precaution to comply with the regulations. I have obtained an ethical clearance certificate from the North University's Research Ethics Committee and my reference number is the following: …….

ABSTRACT

South African agriculture plays a significant role in the development of the economy and in ensuring food security at household level. Thus, entrepreneurship is considered as essential channel for transformation within the economy. Such that development of entrepreneurship in agriculture is handled differently by bodies, including researchers and policy makers. As a result, entrepreneurship is regarded as a key factor for the survival of small-scale farming sector, which operates in an ever-changing and an increasingly global economy. Therefore, agricultural cooperatives are promoted to boost smallholder farmers, thus this study was on the development of an entrepreneurship framework in promoting primary agricultural cooperative's productivity and financial performance.

The study determined and profiled the nature and characteristics of smallholder agricultural cooperatives in Ngaka Modiri Molema district. The study also assessed the current level of productivity and financial performance of primary agricultural cooperative in the study area (efficiency of these cooperatives). Lastly, explored the relationship that exists between entrepreneurship skills and cooperative performance. Primary data of the study was based in only three municipalities of the Ngaka Modiri Molema District- North West province due to their intensity in agricultural activities and time restriction. The cooperative managers, randomly selected from these municipalities and data was obtained through structured questionnaire to interview 29 cooperative managers within the study area.

The study employed descriptive analysis to emphasize the nature and characteristics of the cooperatives from the views of the cooperatives' management to analyse the data acquired from the sampled managers. The results were presented using the general frequency distribution and summary of the descriptive analysis such as frequencies and percentages is illustrated using graphs, charts and tables. The expected results of the study were that most of the agricultural cooperatives are overwhelmed by old and people with lack of formal education, who are mostly men. Further, the results indicate that most of the cooperatives does not own the lands (66%) that they operate in. Therefore, the results obtained from the study indicated that most of these managers were men (62%), not women. In addition, the results indicate that the highest qualification most of the cooperative managers is primary school (48%), which is the lowest level in education.

Additionally, stochastic frontier technique was employed in the study to measure the level of productive efficiency of cooperatives, which showed the technical efficiency of all the

cooperatives skewed in the 0.90 and 1.00 range. The results from the estimates shows that the goodness-of-fit of the estimated model was measured using F-statistics, which showed a p value of .0121 indicating acceptable measure of fit. Moreover, multicollinearity of results was tested to check if there was collinearity in the analysis, and the results showed the Variance Inflation Factor (VIF) of 1.01, which asserts that there is no multicollinearity in the analysis.Three financial ratios were used to assess the financial performance of cooperatives (Liquidity, solvency and profitability). In addition, to analyse the financial performance of the cooperatives, the study used the Data Envelope Analysis. This study used Malmquist DEA methods to calculate catalogues of Total Factor Productivity (TFP) change, technical efficiency change, and scale efficiency change. Furthermore, the result from this analysis shows an average total productivity change of 17.3% of the year 2019/20, which asserts that there has been a decline in the productivity of cooperatives in that year, and this decline was mainly due to technical efficiency change within cooperatives. This means that most of the cooperatives were not growing, technical efficiency of some of the cooperatives were high, which meant that they used most of their advanced technologies. Moreover, 21 out of 29 cooperatives had a decline in in the total factor productivity change during 2019/20, which is 72% of the cooperatives.

Lastly, to describe the existing relationship between entrepreneurship skills and cooperative performance canonical analysis was used. The analysis was conducted to show how much variance of the dependant variables is explained by the dimensions. Furthermore, the study employed Wilk's lamda and corresponding *F*-test to evaluate the null hypothesis of the study, which stated that the canonical correlations for all function are zero. The results of this model showed that only one of the two canonical coefficient was statistically significant at $p<0.05$. The study recognised that management skills, opportunity skills and networking skills have a significant association with the cooperative performance factors (Financial performance and productivity). It also identified that financial performance was the main contributor of performance of the crop cooperatives.

Moreover, the finding of the study aided in developing an entrepreneurship framework which will help to improve the performance of agricultural cooperatives and affiliated members (smallholder farmers). The study recommends that similar studies covering the entire province and all varieties of agricultural cooperatives be undertaken as part of future research.

Key words: Agricultural cooperatives, Financial performance, Productivity, Entrepreneurship skills, Canonical analysis, Data Envelope Analysis

ACKNOWLEDGEMENT

I wish to express special gratitude and appreciation to my supervisor, Doctor Mzuyanda Christian, and the rest of the staff member in the Department of Agricultural Economics and Extension, I thank them for their commitment, encouragement, support, guidance that made this study a priceless learning experience for me. May God bless them abundantly.

Moreover, I would like to give thanks to the two of the employees from the Department of Agriculture and Rural Development in Mmabatho, Mr Kgosi and Mr Gabriel Serobatse for assisting with the retrieval of the Agricultural Cooperative Database and identification of crop cooperatives across Ngaka Modiri Molema District of the North West Province.

I send my sincere gratitude to the National Research Foundation (NRF) for financial assistance during the duration of my Masters studies. Furthermore, I would like to thank managers of cooperative at large, who voluntarily participated in my research project. I would like to thank my friend Bongani Lawrence Kwebulane for assisting with data collection, and also special thanks to Tsholofelo Motsumi for her support (emotional and financial) throughout the course of my studies.

I would also like to thank my family (Mr Rantsekane Mangoejane, Mr Malefo Mangoejane, Mr Monapula Mangoejane, Mr Goitsemodimo Mangoejane, Mrs Dorcas Mabiletsa, Mrs Mamosebetsi Thakanyane, Mrs Mamotlhomedi James) and their spouses, and my mother (Hilda Nkotsi) for their support in all dimensions, more especially financial support. Without their support I wouldn't be at the point that I am at right now.

Above all, I would like to thank the almighty God for his blessings and guidance, and also for being the driver of my life journey.

"Through him everything is possible, glory be to the Almighty God".

DEDICATION

This study is dedicated to my family, especially my mother Mamotube Hilda Nkotsi and my younger sister Rebaone Boitumelo Mangoejane for their endless support and guidance in all aspect of life, love and care. My uncles and aunts and their families who have been there for me financially and emotionally since I have started with journey. I love and appreciate you all.

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LIST OF ACRONYMS

AEDM – Agricultural Entrepreneurship Development Model

DAFF – Department of Agriculture, Forestry and Fisheries

DEA- Data Envelopment Analysis

DMU – Decision-making Unit

DRDLR – Department of Rural Development and Land Reform

DTI – Department of Trade and Industry

EP – Entrepreneurial Performance

GEM – Global Entrepreneurship Model

ICA – International Co-operative Agency

ROI – Return on Investment

RSA – Republic of South Africa

SA – South Africa

SEDA – Small Enterprise Development Agency

STATS SA – Statistics South Africa

TEA – Total early-stage Entrepreneurial Activity

USB – University of Stellenbosch Business School

TFP - Total Factor Productivity

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CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Entrepreneurship is regarded as an important channel for bringing about transformation to sustainable products and processes, complimented by several high-profile thinkers promoting entrepreneurship as a possible solution for many social and environmental concerns (Hall, Daneke & Lenox, 2010 as cited by Kavari, 2016). Different institutional bodies (researchers, advisory services, policy makers and farmers' unions) are all working towards developing entrepreneurship in agriculture and trying to find answers regarding questions asked on the relevance of entrepreneurship in agriculture. Agricultural cooperatives are promoted to boost the smallholder farmers' productivity (Christian, 2014) and also to equip them with entrepreneurship skills.

South African agriculture plays a significant role in the development of the economy and in ensuring food security at the household level (DRDLR, 2019). The importance of the concept sustainable development of the economy has been an ongoing debate for some time, and entrepreneurship is being cited as a significant channel in addressing social and environmental concerns and for bringing a transformation to sustainable products and processes (Hall, Daneke & Lenox, 2010). In this context, entrepreneurship is defined by Ahmad and Seymour (2008)as a phenomena that seeks to generate value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes and markets. According to Preisendorfe *et al.,* (2012) South Africa has a low participation in entrepreneurial activities, although entrepreneurship in the country may be a promising driver to drive the population out of poverty, lack of job opportunities and social exclusions.

The South African economy is faced by a challenge to increase the number and variety of economic enterprises which are viable and sustainable (DTI, 2004). The majority of the enterprises or cooperatives which were registered about a decade ago are inoperative now due to this challenge (DAFF, 2015). The development of these enterprises is interrupted by South African history such as the racial history and the destruction of wealth in black hands located both in rural and urban areas. According to DTI (2004) these negatively affect income distribution, employment creation and entrepreneurship. The success of such enterprises relies on the environment in which they operate, and in most cases it is affected by factors that are

beyond the control of the farmers. In less-developed countries, smallholder farmers are known to be the drivers of the agricultural development (Machethe, 1990). Thus, Delgado (1999:165) argues that "Smallholder agriculture is simply too important to employment, human welfare, and political stability in Sub-Saharan Africa to be either ignored or treated as just another small adjusting sector of a market economy" (as cited by Chibanda, Ortmann & Lyne, 2009). Policies made by the government and agricultural investments have a greater influence in the environment and this is the reason why the entrepreneurship environment differs from country to country (Kahan, 2012).

In less developed countries governments have been promoting the use of cooperatives as organisation which can potentially develop their small-scale farmers (Chibanda, Ortmann & Lyne, 2009). Therefore, these cooperatives need to create the right environment to enhance the level of entrepreneurship among these small-scale farmers. According to the DAFF (2015) cooperative movement plays an important role in employment creation for both salaried and self-employed jobs in Africa, and they operate independently from the government. Based on the finding of Kavari (2016), the results revealed that entrepreneurial performance was positively impacted by factors such as supportive environment, entrepreneurial orientation and agricultural sustainability. However, it also pointed out that neither cooperative environment nor entrepreneurial competencies has an impact on entrepreneurial performance.

According to Kelley, Bosma and Amoros (2010), entrepreneurs are regarded as the drivers and shapers of innovation and bring greater efficiency to agriculture. Gartner (1988) suggested that it will not help to focus on the individuals' traits and their personality characteristics to help define an entrepreneur and to understand the underlying principles of entrepreneurship. The author further urges the researchers and scholars to avoid using the trait approach and adopt the behavioural approach when studying entrepreneurs and that they should concentrate their focus on entrepreneurs rather than who they are (Gartner, 1988).

Cooperatives also plays a significant role in the economic development because they act as commercial organizations that do not chase after the profits only but also assists farmers to access markets and services, moreover, it does not look at the interests of the members only but also the interests of the community which they serve (DAFF, 2015). They are referred to as an off-farm extension of the farm firm and which is very vital for vertical integration of a farming enterprise (Torgersons, 1977). This allows farmers to be entrepreneurs. Agricultural

cooperatives have been playing a very vital role in the development of the commercial agricultural sector in South Africa since the early twentieth century (DAFF, 2015).

The use of cooperatives is promoted by the SA government as organizations that can help to enhance the development of small-scale farmers and the communities around South Africa. A new Cooperatives Act (No.14 of 2005), which is based on the international cooperative principles was lawfully signed by the SA government in August 2005. This particular Act foresees a major role for cooperatives in promoting the social and economic development, "more especially by creating employment, generating income, facilitating broad-based black economic empowerment and eradicating poverty" (RSA, 2005: 2). The SA government has also committed and pledged itself to provide a supportive legal environment for cooperatives.

North West province has about 222 agricultural cooperatives which are registered, of which only 215 are agricultural related and constitutes 13 % of the total number of cooperatives found in the country (DAFF, 2015). Only 40 % of the total cooperatives are classified as operational and expanding and 23% are operational and stable. These cooperatives play a significant role through their contributions (production and employment) to both the provincial and national economy. The province is well-known in producing crops and livestock, therefore the highest number of cooperatives in the province are involved in the production of these two commodities (52 and 60 respectively), and second dominant commodities are mixed farming, poultry and vegetables with 30 cooperatives each (DAFF, 2015). As a result, this promotes a need for these cooperatives to have stronger entrepreneurial skills as that will increase their chances of optimally practicing agribusiness and not just agriculture.

1.2. Statement of the problem

Entrepreneurship is regarded as a key factor for the survival of small-scale farming, which operates in an ever-changing and an increasingly global economy (Kahan, 2012). In agriculture, farmers see their farms as a business that can generate revenue by means of profits. In order to generate profits from their farm operations, they must be more than willing to take risks and grow their farms, therefore the need of a framework that will help understand the agribusiness environment and become innovative. Thus, the need to understand the concept of entrepreneurship, value chain and marketing linkages when promoting agribusiness in the farming sector (Kahan, 2012).

According to DAFF (2012) and Global Entrepreneurship Model (2020), South Africa has a low entrepreneurial activity compared to other developing countries. This is due to the fact that most of the farmers in SA operate at a small scale (Ortmann & King, 2007). This is supported by Makhura (2001) and Moloi (2010) where they indicate that most of these farmers are subsistence farmers, and they are located in semi-arid areas which are overpopulated. According to DAFF (2015) these farmers are faced with challenges such as low productivity and poor access inputs, which may hinder them from being more productive in the markets and enhance their revenues. These challenges can be overcome by the help from extension workers and other institutional interventions like cooperatives (Kahan, 2012). Thus, the promotion of cooperatives within these type of farmers as that cushions them challenges faced by smallholder farmers'. Additionally, this concept was promoted by the South African government as organizations that help to enhance the development of small-scale farmers and the communities around South Africa. Such that, The SA government lawfully signed a new Cooperatives Act (No.14 of 2005), to promote the use of cooperatives (RSA, 2005).

Although agricultural cooperatives were promoted to improve the financial performance and productivity of farmers, this has not been the case in most developing countries and some studies suggests that cooperatives have no impact on farmer's revenue (Hun *et al*., 2018). According to Hun *et al.,* (2018), cooperatives provide little or insufficient training for their members, and cooperative members were less than really interested in attending the training provided. On the contrary, another significant study that was done in China revealed that being a corporate member has a positive and statistically significant impact on gross income and farm profit (Abdalai & Ma, 2017). Furthermore, this is likely to benefit only members of the cooperatives in comparison to non-members.

The ever-changing environment of farms currently forces farmers to develop their farm business economically for their survival and success (de Wolf & Schoorlemmer, 2007). Therefore, there might be a need for the development of entrepreneurial framework, which may assist cooperatives to develop corrective measures which will ensure that smallholder farmers within those cooperatives are equipped with entrepreneurial skills and that they have equal and satisfactory opportunity to access their respective production and marketing needs. This will increase the performance of the province on the ideals of the National Development Plan (NDP 2025). It will also satisfy the mission of the Department of Agriculture, Forestry and Fisheries

which is to achieve the "advanced food security and transformation of the sector through innovative, inclusive and sustainable policies" (DAFF, 2017).

In order for the cooperative sector to achieve this objective, it will need to increase the quality of cooperative, entrepreneurship education. The study that was carried out in Latvia by Zvirgzdina *et al*., (2009), pointed out that the productivity of farmers was low because there were considerable areas of unutilized agricultural land in Latvia. Land is also one of the significant production factors which may have a greater impact on the productivity of smallholder farmers. There have been several studies about cooperative entrepreneurship in South Africa such as Griffin and Oosthuizen (2016), Kavari (2016), Modiba (2009), etc., but none of them has ever developed an entrepreneurship framework. This study intends to fill this gap by developing an entrepreneurship framework which is aimed at improving productivity and financial performance of smallholder agricultural cooperatives, especially of the North West province. Thus, this framework is in line with the goal number 2 and 4 of the Sustainable Development Goals 2030 (SDG). Goal 2 aims that "By 2030, double the agricultural productivity and incomes of small-scale producers, in particular women, indigenous people, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment", whereas goal 4 aims to "substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship" (UN General Assembly, 2015). Therefore, the results from this study may be used as information by the policy makers.

1.3. Sub-research questions

i. What are the nature and characteristics of smallholder agricultural cooperatives in North West Province?
ii. What is the level of productivity and financial performance of agricultural cooperatives?
iii. What is the relationship between entrepreneurship skills of cooperative managers and cooperative performance?
iv. What entrepreneurship framework can improve the productivity and financial performance of smallholder agricultural cooperatives (crops)?

1.4. Objectives of the study

1.4.1 Main objective

The main objective of the study is to develop an entrepreneurship framework which can potentially improve productivity and financial performance of smallholder agricultural cooperatives at North West Province.

1.4.2 Specific objectives

i. To determine the nature and characteristics of smallholder agricultural cooperatives in the North West Province.
ii. To assess the current level of productivity and financial performance of smallholder agricultural cooperatives.
iii. To describe the relationship between entrepreneurship skills of cooperative managers and cooperative performance.
iv. To develop an entrepreneurship framework aimed at improving productivity and financial performance of smallholder agricultural cooperatives (crops).

1.5. Hypothesis

H_0**1**: There is no relationship between entrepreneurship skills of cooperative managers and cooperative performance.

H_0**2**: The proposed entrepreneurship framework does not directly nor positively influence the productivity and financial performance of smallholder agricultural cooperatives.

1.6. Purpose of the study

The study purpose is to develop entrepreneurship framework which can potentially improve productivity and financial performance of agricultural cooperatives at Northwest Province. This was done by determining the nature and characteristics of the primary agricultural crop cooperatives in Ngaka Modiri Molema district and further measure their levels of productivity and financial performance to develop an entrepreneurial framework aimed at increasing the productivity and financial performances of those cooperatives. Moreover, examining the exiting relationship between entrepreneurship skills of cooperative managers and cooperative performance.

1.7. Significance of the study

Ortmann *et al.,* (2007) argues that the only organizations that has the potential to improve the development of smallholder farmers and other communities in South Africa are the agricultural cooperatives. Xaba (2014), asserts that the business environment in all economic areas in South Africa fosters opportunities for entrepreneurial success. However, the development of the agricultural sector and the success of the agricultural cooperatives within the country is limited by the inadequacy of entrepreneurial skills (Xaba, 2014). According to the Global Entrepreneurship Model (GEM SA, 2020), South Africa's entrepreneurial performance is low and disappointing as compared to other countries globally. South Africa was ranked 49th out of 54 economies on GEM's National Entrepreneurship Context Index in 2019 and 60th out of 141 economies on the Global Competitive Index (GEM SA, 2020). This index expresses the average state and the quality of the entrepreneurial ecosystem of a country.

Entrepreneurship is seen as a key for survival needed by small-scale farmers that operates in a complex and an ever-changing global economy. It is also considered as the driving factor of economic and cultural development society (DTI, 2012). This study seeks to uncover entrepreneurial skills required by smallholder crop farmers' in the North West province by developing the suitable entrepreneurship framework best fitting for these farmers.

These entrepreneurship skills are being recognized as the best avenue of executing business activities in farms (Rudmann *et al.,* 2008). They result from an interaction between individual farmers and the environment. According to Yaghoubi (2010), for cooperatives to achieve this, it is outermost necessary to increase the quality of cooperative, entrepreneurship education. The author further deems it necessary for improvement to develop an entrepreneurial culture, support entrepreneurs and creation of employment. So, these cooperatives have the potential to make contributions towards the economic development of the North West province.

Agricultural cooperatives can improve the productivity of farmers by providing them with access to management skills and production resources as they together pool their resources, and through this accessibility to resources cooperatives also can also improve its financial performance (Msimango & Oladele, 2013). The findings of this study will also be useful recommendations for policy makers within the department of agriculture of the North West province in an attempt to promote entrepreneurship among smallholder agricultural cooperatives. Furthermore, the policy makers can use this study when formulating strategies on how to intervene profoundly when helping smallholder agricultural cooperatives with

regards to entrepreneurship development. It will also contribute to the body of knowledge to fill the gap which exists with regards to cooperative entrepreneurship, with limitations to productivity and financial performance. In addition, the study proposes an entrepreneurial framework which is aimed at improving productivity and financial performance of the smallholder agricultural cooperatives. This framework will assist primary corporative managers understand the agribusiness management, therefore helping them understand which entrepreneurship skills are required by smallholder farmers in order to be entrepreneurial and become innovative.

1.8. Delimitation/Scope of the study

The study aims to develop an entrepreneurship framework aimed at increasing the financial performance and productivity of smallholder agricultural cooperatives in the North West province. This study will involve only primary cooperatives and will be delimited from any other form of agricultural cooperatives found within the study area, and it will only focus on cooperatives which are only involved in crop production. The study will also focus on agricultural cooperatives and corporate managers located in the district of Ngaka Modiri Molema. Therefore, the findings of the study cannot be used in some parts of the province or country.

1.9. Definition of key terms

a) Entrepreneurship:

The complexity of this term has given a rise in various definitions and yet there is no consensus on which definition to use. Various authors from fields like sociology, economics and psychology have tried to bring up different theories to best define this term. According to Carlsson *et al*., (2013: 914) entrepreneurship is defined as "an economic function that is carried out by individuals, entrepreneurs, acting independently or within organizations, to perceive and create new opportunities and to introduce their ideas into the market, under uncertainty, by making decisions about location, product design, resource use, institutions, and reward systems".

b) Entrepreneurship framework:

Having to understand different challenges faced by many smallholder farmers in agriculture and roles played by agricultural cooperatives in the development of farmers, there seem not to be much development with regards to entrepreneurial performance of cooperatives. Therefore,

cooperatives need a framework of which its mandate is to increase the productivity and financial performance of cooperatives. A framework is defined as the underlying system of ideas, information and principles used to form the structure that an organization can operate within (Cambridge, 2020). It can be used to resolve issues faced by organizations. Therefore, entrepreneurship framework may be regarded as a structure that is used to carry out economic functions of organizations or farms.

c) Productivity:

Productivity in agriculture is determined by a number of factors. It is referred to as the ratio of its output to its input (Fried *et al*., 2008). For the purpose of this study, productivity is defined as the ratio of value of the total farm output to the value of total farm inputs used in the production in the two consecutive farming sessions (Fried *et al*., 2008). Some studies used technical efficiency to measure the productivity of agricultural cooperatives, and for smallholder farmers to achieve productivity gains, they need to access to production inputs and other extension facilities, and thus this will help them increase their productive efficiency (DAFF, 2015). Heady (1952) asserts that to measure technical efficiency you use the magnitude of the physical ratio of product output to factor output, furthermore, the degree of technical efficiency greater when the level output is greater. Thus, productivity can be achieved by using the available resources/inputs to produce maximum output. Various inputs that can increase productivity include land, labour, seeds, fertilizers, irrigation and other basic factors (Heady, 1952)

d) Financial performance:

In several research, a composite indicator was utilized as a stand-in for measuring farmers' financial performance (Heenkenda & Chandrak, 2016). An aggregated index consists of various individual financial performance scales and indicators. The self-reported profit over the past three years, farmer household savings, insurance use, debt-to-income ratio, and capital investment over the past three years are all relevant indicators. While other studies use output price, gross income, farm profit, and return on investment (ROI) to measure farmers' financial performance. To measure financial performance ROI is used as an indicator, instead of focussing on improving farm income only, rather it also takes into consideration the profitability of agricultural investment (Böhme, 2015; Kleemann, Abdulai, & Buss, 2014).

e) Agricultural cooperatives:

The term cooperative is best defined by the International Cooperative Alliance as "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise" (ICA, 2005). Agricultural cooperatives are promoted to enhance smallholders' farm performance (Ahmed & Mesfin, 2007). According to the literature by Abebaw and Haile (2013), Hellin et al. (2009), Huang and Ding (2016), Mojo et al. (2017), and Zheng, Wang, and Awokuse (2012), the general goal of cooperatives in developing countries is to help smallholder farmers participate in the market, increase farm incomes, improve crop productivity, and reduce production costs.

1.10. Research outline

This study comprises of five chapters. The **first chapter** provides an introduction to the study, research questions which questions the study objectives, the problem statement and study significance are also discussed. A detailed presentation of literature review on entrepreneurship and smallholder agricultural cooperatives in **chapter two** of the study. **Chapter three** discusses the theoretical and conceptual framework on entrepreneurship, models of entrepreneurship and also the methodology used in the study. The results of the study are discussed in **chapter four**. Finally, **chapter five** presents a summary of the research findings, conclusion and the study recommendations followed by a reference list and appendices at the end of the dissertation.

CHAPTER TWO

AN OVERVIEW OF ENTREPRENEURSHIP AND SMALLHOLDER AGRICULTURAL COOPERATIVES IN SOUTH AFRICA

2.1. Introduction

The purpose of this study is to develop an entrepreneurship framework aimed at increasing the productivity and financial performance of smallholder agricultural cooperatives in the North West Province. This section reviews literature about entrepreneurship and the smallholder agricultural cooperatives in the Agricultural sector. The review presented is divided into eight sections, namely: (i) theoretical framework on entrepreneurship development ; (ii) the background of South African smallholder in the context of entrepreneurship; (iii) history of agricultural cooperatives; (iv) the status quo of agricultural entrepreneurship in the South African context, (v) entrepreneurship skills that are required in the smallholder agribusiness sector; (vi) entrepreneurship on productivity and financial performance: Empirical evidence; (vii) conceptual frameworks and models of entrepreneurship; and lastly (viii) the chapter summary.

2.2. Theoretical framework on entrepreneurship development

As highlighted in the statement of the problem, entrepreneurship plays a most significant role in the improvement of livelihood, job creation, and the development of an economy. Furthermore, the emphasis was done on the creation of a conducive entrepreneurship environment. A model-based study conducted by Prescott (1986) which examined the relationship between environment, strategy and performance confirmed the seriousness of the environment in entrepreneurship development. This is in line with study done by Porter (1981), which maintains that environments are the primary determinants of performance.

Two separate characteristics of corporate entrepreneurship were found by the empirical data from Zahra's 1993 study, which studied the relationship between the external environment, corporate entrepreneurship, and financial performance are listed below.

I. corporate innovation and venturing.

II. corporate renewal activities.

With regards to corporate innovation and venturing, the author highlights a new product introduction, new business creation, percentage of revenue from new product and technological

entrepreneurship. Then, the corporate renewal activities dimension includes the reformulation of the mission, restructuring, and system wide change (Zahra, 1993). Therefore, to examine if there's a significant association between corporate entrepreneurship and the financial performance of a company/firm the author used the clustered environment settings. The study's findings showed that each of the clusters had its own rare combination of corporate innovation and entrepreneurial activities, and that these activities varied in terms of how they affected a farm's growth and profitability.

2.3. The cooperative concept

The International Cooperative Alliance (ICA) has defined a cooperative as "an association that is independent and people come together voluntarily hoping to conjoint economic, social, and cultural needs and ambitions by such an enterprise that is jointly owned and democratically controlled" (ICA, 2005). The cooperatives were seen as an economic alternative, which are viable, vibrant and strong to address the issues that were faced by the poor and vulnerable people in the world (Rena, 2017). The issue that they were faced with was either they had limited and or no resources at all which would allow them to remain sustainable in the presence of the seen and unforeseen harsh socio-economic factors. The main aim of these cooperatives was too pool scares resources together and use them as collectives, to attain welfare changes (Rena, 2017). According to Christian (2014), the basis of social life amongst human being has forever been the mutual help and the inter-dependence. This has been the case all over the world that human beings need each other, thus they cannot live on their own. Even in the agricultural sector, it is normal to find individual farmers working together as a collective to reach their common interest.

2.3.1. Historical perspective and definition of cooperatives

The earliest cooperative that has been documented is from the year 1750. This cooperative was founded among local cheese producers in the Franche-Comté region of France (Rena, 2017). There appears to be little consensus on the precise origins of cooperative societies, apart from this cooperative. Even though, others have been arguing that they began in Europe (Rena, 2017). Contrarily, Birchall (1997) claims that modern cooperatives were first established in Britain in the late eighteenth century. Friendly societies were founded by working class groups in Britain with the primary goal of trying to insure each other against life's hazards. By 1834, they had more than a million members (Rena, 2017). They were perceived as a self-help movement, a reaction to the industrial revolution's insecurity of wage labour. Building societies

established a building fund for members which will contribute to the housing construction expenses. When a statute was passed in 1834 allowing them to engage in any activity that was "not repugnant to law," early manufacturing and retailing societies were also able to register as a particular type of industrial and provident society (Birchall, 1997). Even though joint stock corporations had only been permitted without special law since 1844, they had the same limited liability protection in 1862 as they had received in 1855. Cooperatives for agriculture emerged considerably later. In the British colonies, cooperatives arose as a result of these changes, but they developed independently elsewhere. For instance, cooperative banks and mutual insurers prospered in Germany, housing cooperatives increased in popularity in Norway and Sweden, and agricultural cooperatives prospered in Denmark. (Rena, 2017). To date there are different cooperative principles that are being published, which are inclusive but not limited to the Rochdale Principles, ICA Principles and the US Principles (Rena, 2017).

2.3.1.1. Rochdale Principles

Because they couldn't afford food and home products owing to low earnings and terrible working conditions, they pooled their purchasing power to get better pricing on flour, oatmeal, sugar, and butter. The Rochdale Society, though not the first cooperative, is credited with popularizing the contemporary cooperative model by propagating its cooperative values, which are summarized in United States Department of Agriculture (1997) as:

1. “Open membership;
2. One member one vote;
3. Cash trading;
4. Membership education;
5. Political and religious neutrality;
6. No unusual risk assumption;
7. Limitation on the number of shares owned;
8. Limited interest on investment;
9. Goods sold at regular retail prices; and
10. Net margins distributed according to patronage”.

2.3.1.2. ICA Principles

The International Co-Operative Alliance (ICA) is the biggest non-governmental organization in the world, founded in 1895 to represent cooperatives across the world. ICA (1995) adopted the following seven cooperative principles in the spirit of the "Rochdale Pioneers":

1. “Voluntary and open membership

   Any person is allowed to join and use resources of the cooperative as long as they accept responsibilities of being a member.

2. Democratic member control

   Members of the cooperative are the ones that democratically control the cooperative, and board members are chosen by members as they all participate in decision making process using the principle “one member one vote”, regardless of the individual contributions made by each member.

3. Member economic participation

   The cooperative capital is accumulated through the contributions made by each member, and they all pay a joining fee. The cooperative may also decide on a monthly joining subscription, which may be made compulsory for all members. These contributions are used for cooperative development.

4. Autonomy and independence

   The cooperative is controlled by its members only. Even in the case that they receive external support or employ the project manager, or maybe enter into agreements with other organizations, they should always make sure that they don’t lose control over their cooperative.

5. Education, training and information

   The cooperatives should always involve their members in basic development in order to advance business and governance skills. This helps in the sustainability, governance and management of their cooperative.

6. Cooperation among cooperatives

   The cooperation amongst the existing cooperatives is encouraged. This can be perhaps achieved by doing business together with the aim of increasing the competitiveness, sharing of ideas, experiences, and knowledge, as well as improving their market opportunities, etc.

7. Concern for community

The cooperatives should make a positive contribution to the development of their respective communities. For an example, this can be achieved by creating employment opportunities to the members of the community, contributing to the social services, supplying decent products and services at competitive prices, donating to the needy, etc. The cooperative can only do what is affordable to them".

2.3.1.3. US Principles

Hardesty and Salgia (2004) highlight three key cooperation ideas that have been codified in federal and state tax codes in the United States.

1. "User-ownership;
2. User-benefit; and
3. User-control".

There are many different definitions and views on the cooperatives. The University of Wisconsin Centre for Cooperatives (2002), for example, describes cooperatives as "a business that is voluntarily controlled and owned by its member patrons". The management of the operations in the cooperative society is done by these member patrons to their benefit on a non-profit making manner. On the other hand, Laidlaw (1974) defines a cooperative as a business enterprise that is aimed at complete identity of the component factors of ownership, control and use of service, which distinguishes it from other businesses . The USDA (1997) also provided a broad definition, which is less political and more functional: "a business owned and democratically controlled by the people who use its services and whose benefits are derived and distributed equitably on the basis of use". This definition clarifies that cooperative member's gain from their participation in proportion to the amount of money they spend with the organization. In each of the above definitions, emphasis is made on the democratic control. Furthermore, Rena (2017: 8) defines "a cooperative as an organisation in which those who transact with (i.e. "patronise") the organisation also own and formally control the organisation, and derive significant benefits from those transactions over and above any financial returns they derive from their investment in the organisation". This definition reflects the characteristic of patronage-based rewards that appears to set cooperatives apart from other types of organizations.

However, this study will adopt only one definition of a cooperative, which is also relevant to this study and the South African context, which is the ICA (1995) definition.

> Agricultural co-operatives are defined by the International Co-operative Alliance (ICA) (1995) as "an autonomous association of people united voluntarily to meet their common economic, social aim as well as aspirations through jointly owned democratically owned initiative".

This definition is explained by Christian (2014) as follows:

i. "Firstly, this definition means that these co-operatives are formed by groups of people who have a common goal and need.
ii. Secondly, this definition means that these initiatives are formed freely by members after they all have contributed with their assets.
iii. Thirdly, these initiatives are democratically formed in order to achieve a specific objective and
iv. Lastly, the organization is an independent initiative promoted, owned and controlled by the members to satisfy their needs".

2.3.2. Values for cooperatives

Cooperatives are supposed to embrace five values in all of their actions, according to CIA (2005), and cooperatives are able to touch the lives of the poor and vulnerable through these principles. The values are as follows:

i. **Equality**
   In the business, every member has an equal opportunity.
ii. **Self-reliance**
   Members should not rely on others to complete tasks; instead, they should rely on themselves by cooperating to achieve their objectives.
iii. **Self-help**
   Co-operatives are in charge of their own achievements and failures; they don't have to rely on others or blame others for their failings. They should be accountable for whatever they do in their business.
iv. **Self-responsibility**
   This value is generally articulated, as noted above on a concern for communal principle. It is contingent on the cooperative's interpretations. In general, this means that the cooperative should look after the community in which they live.

2.3.3. Objectives and activities of agricultural cooperatives

According to the Department of Trade and Industry (2005), cooperatives were introduced because of a number of objectives that the government and farmers themselves seek to achieve. The introduction of these cooperatives were acknowledged by the South Africa government as real, independent and economically viable organizations which has the potential to:

- "create and develop income-generating activities and sustainable decent employment;
- develop human resource capacities and knowledge of the values, advantages and
- benefits of the co-operative movement through education and training;
- develop business potential, including entrepreneurial and managerial capacities;
- strengthen competitiveness as well as gain access to markets and institutional finance;
- increase savings and investment;
- improve social and economic well-being, taking into account the need to eliminate all forms of discrimination;
- contribute to sustainable human development; and,
- establish and expand a viable and dynamic distinctive sector of the economy which responds to the social and economic needs of the community"

Agricultural production groups, according to research, are primarily targeted at functioning as small-scale firms and play a key role in creating employment and income for members to attain higher quality of life via self-help (Bembridge, 1997; Aliber, 2005). Agricultural cooperatives fulfil their purpose by achieving goals that are difficult to attain when smallholders work alone (DTI, 2005). According to FAO (1997), the ability to acquire financing is one advantage of shared obligation for farmers. Individual farm households sometimes lack collateral, so members band together to ensure repayment. For the purpose of ensuring that agricultural products such as poultry, vegetables, and dairy products are delivered reliably and on time, marketing organizations bring together input suppliers, producers, and merchants. Farmers who join co-operatives with similar goals and an enthusiasm for farming, according to FAO (1997), are more likely to succeed.

The crucial activities which are the fundamental elements for a vibrant cooperate are the acquisition, utilisation and management of basic resources (Mohamed, 2004). According to Kim and Mohaney (2005), primarily the function of the cooperative was to market agricultural output, however, the cooperatives' present activities tend to benefit from the whole value chain.

In developed countries ,agricultural cooperatives frequently secure finance and engage in agricultural production, storage, processing, packaging, distribution, and sales (Marshal, 2005).Murray and Konstantinos (2003) asserts that finance activities in co-operatives preserve capital, production activities generate outputs, and overall activities are directed toward attaining the goals.

In South Africa, co-operatives offer a variety of services including field crops, horticulture, livestock, trading of agricultural commodities, handling and storage facilities, marketing of farming equipment, production and distribution of animal feeds, running of retail stores, financial services, sale and distribution of crop care products, and packaging of agricultural produce (Dlamini, 2010). Management, leadership, and control actions, according to Prakash (2004), are vital and have a substantial impact on co-operative dynamics. Therefore, the Co-operatives Act mandates that cooperatives be properly managed and governed by democratically elected and qualified boards of directors (DTI, 2005). Management and leadership actions ensure that activities are initiated, coordinated, supervised, and evaluated. Any organization's effective management should monitor performance against established criteria and devise smart methods for allocating and delegating personnel. In the cooperative, management should guarantee that the advantages and drawbacks of alternate courses of action are compared. According to Knight et al. (2003), successful co-operative governance requires a management structure that is transparent, trustworthy, adaptable, responsible, and enforceable, as well as having integrity and being practical.

2.3.4. Level in the cooperative hierarchy

According to the cooperative Act No. 14 of 2005, the cooperatives are classified into the following categories (Christian, 2014): -

2.3.4.1. Primary cooperatives

Whyte (1988) defined a co-operative as a group of at least five natural people whose goal is to offer employment or services to its members while also assisting community development. Food gardens, rural sewing groups, and rural tuck stores are all examples of primary cooperatives.

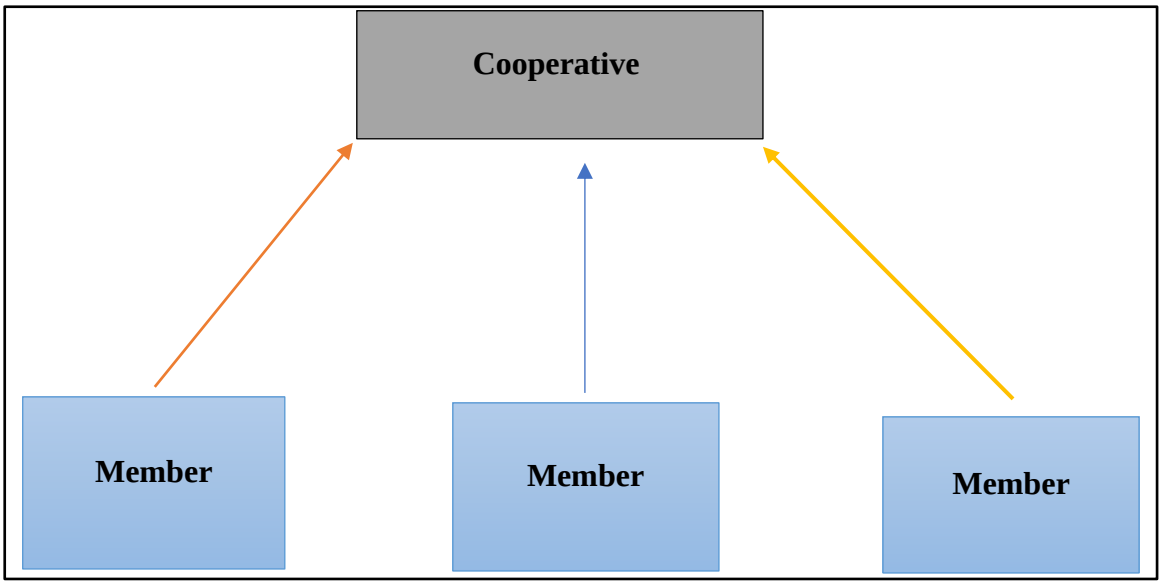


Figure 2.1: Primary cooperative structure

Source: Christian, (2014)

2.3.4.2. Secondary cooperative

According to the World Bank (1993), secondary co-operatives are made up of two or more primary co-operatives with the aim of offering effective and complete services to their members. This kind of cooperative will even sign a contract for the supply of services for a specific period of time. It also offers services to major corporations like Shoprite, Spar, and Woolworths.

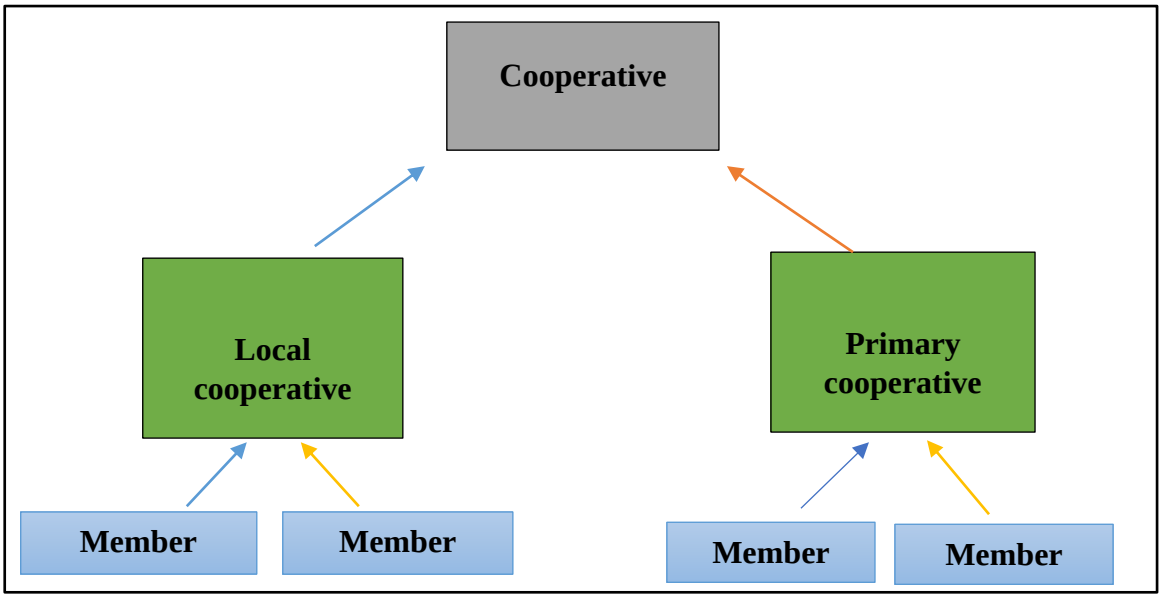


Figure 2.2: Secondary cooperative structure

Source: Christian, (2014)

2.3.4.3. Tertiary cooperative

The World Bank (1993) described a tertiary cooperative as a co-operative with secondary co-operatives as members. Their main goal is to support and enlist the assistance of the government, business community, and other stakeholders to advance a particular industry among their members and the local community (cited by Christian, 2014)

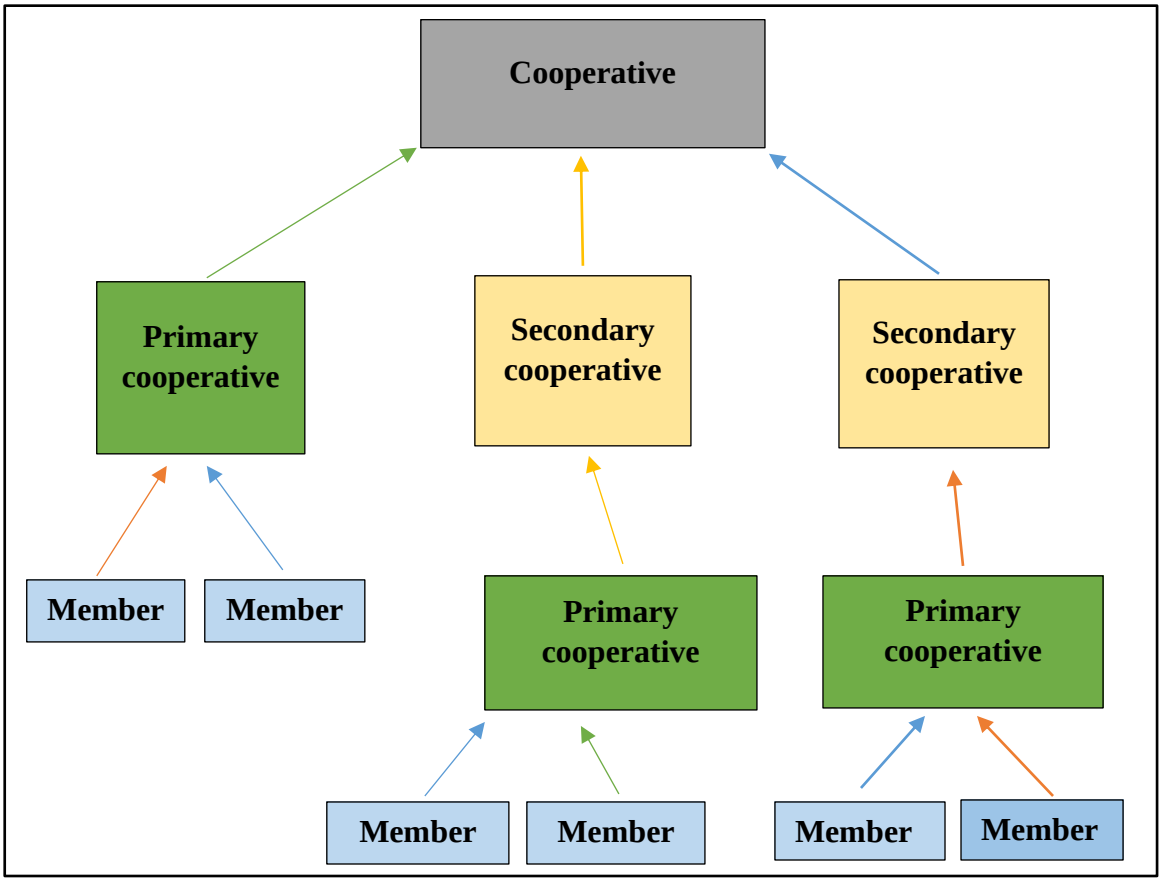


Figure 2.3: Tertiary cooperative structure

Source: Christian, (2014)

2.4. Agricultural cooperatives in the South African context

2.4.1. History of agricultural cooperatives in South Africa

The South African cooperative system was first developed during the apartheid era (Dyalvane, 2015). Before the year 1970, these cooperative sectors were dominated by white agricultural cooperatives with the aim of improving their farming communities (DTI, 2012). These agricultural cooperatives were responsible for citrus and deciduous fruit exports, handling and processing of wool clip, and marketing of dried fruit (Mazibuko, 2009). They also provided financial support of production inputs such as fertilizers, machinery and implements, fuel and

certain proportion of the chemicals (Mazibuko, 2009). The then presiding South African apartheid government began to promote black-owned agricultural cooperatives during the period between 1970 and 1980, although they were weak and remained underdeveloped, and not much support was provided to them like it was for the white agricultural cooperatives (DTI, 2012). This was contradicting the policies of international cooperatives, since these cooperatives were equally supported by their governments, not according to the races or ethnicity of the members.

Countries like Kenya, Canada, Brazil, Poland, Ireland, Caribbean Confederation, Mexico and Costa Rica had the most supportive policies that governed and supported their agricultural cooperatives (Tsholoba, 2015). According to Barbara and Gerhard (2013), the growth of cooperatives impressed the South African government to the extent that they started to formulate acts and policies with the aim of supporting their cooperatives. This was after the majority of black people raised their concerns and requested that some of the rules and laws that were oppressive should be demolished. Three different types of cooperatives, including those owned by people of colour, were permitted to register under the 1981 Cooperative Act (Tsholoba, 2015). Trading cooperatives, agricultural cooperatives, and special farmer's cooperatives were among the cooperatives that may be established (Mazibuko, 2009). With regards to benefits received from the use of agricultural cooperatives, Togeson *et al*., (1998) pointed out that cooperatives were known to benefit only their members when they are facing inadequacy situations, for example, in North America cooperatives used to link farmers to markets and help them with product distribution, and also influence the prices and other trading terms, while at the same time protecting their members from being exploited.

The use of cooperatives is promoted by the South African government to help improve the development of the smallholder farmers in the country (Dyalvane, 2015). According to the Department of Trade and Industry (2004), cooperatives contribute to the country through job creation, equitable distribution of income and resource mobilization. Similarly, Khumalo (2014) stated that cooperatives can improve the livelihoods of many and they also have the capacity to grow the economy of South Africa. The South African government issued a new legal framework called the "Agricultural White paper of 1995, at the end of the apartheid era (Mazibuko, 2009). This framework aimed to liberalise and deregulate marketing in agriculture, land reform and certain agricultural policy aspects. In August 2005, the South African government committed itself and promised to provide a supportive and legal environment (Agrerkon, 2007), and lawfully signed a new Co-operatives Act (No.14 of 2005) which is based

on international co-operative principles. The major role of this Act is to promote social and economic development, "in particular by creating employment, generating income, facilitating broad-based black economic empowerment and eradicating poverty" (RSA, 2005).

The extant literature (Van Niekerk, 1988; DTI, 2004; Piesse *et al*., 2003; RSA, 2005) about the history of co-operative development in South Africa confirms that a consumers' co-operative was the first cooperative to be established in South Africa in 1982, under the Companies Act. According to Van Niekerk (1988) this act was used because at that time the cooperatives act was not yet formulated. Before the first Cooperative Act could be established in 1908, Companies Act was used to register few of the cooperatives that existed by that time. The second Act that was established was the Cooperative Societies Act of 1922 (Act No.28 of 1922), focusing mainly on agricultural activities. After the recommendations made into Cooperatives and Agricultural Credit of 1934, the South African Parliament issued the Cooperative Societies Act of 1939 (Act No. 29 of 1939) which retained its focus on agricultural activities. The Cooperative Act of 1981 (Act No. 91 of 1981) took over from this act after making amendments (Dyalvane, 2015).

Piesse *et al.,* (2003) highlighted that three main business areas which the cooperatives were involved in were: the purchase, storage and subsequent sale of agricultural commodities; transport services; and the purchase and sale of agricultural inputs and equipment. Thus, the first formal cooperative to be established was the Pietermaritzburg Consumer Cooperative, registered under the Companies Act in 1892 (Mazibuko, 2009). Moreover, these cooperatives were used as agents to provide credit to commercial farmers. The Government also used them to provide disasters assistance to farmers in a form of debt consolidation (Dyalvane, 2015). In the year 2004, out of 4 310 registered cooperatives in South Africa, only 459 cooperatives were registered under the agricultural sector (Registrar of Co-operatives, as cited by Walt, 2005). As of 31 March 2009 number cooperatives that were registered in the agricultural sector was 6 086, with a survival rate of 11%, which shows a significant increase (DTI, 2012). Furthermore, Walt (2005) maintains that regardless of the rapid growth of new cooperatives, it is often difficult to know which ones are operational and shows a potential development.

According to a study conducted by Walt (2005) about the resuscitation of the corporate sector in South Africa, the study found that 65 percent of the sampled cooperatives from the Limpopo province in South Africa were not operational due to poor management, conflict among members, lack of funds, lack of training and some of them after they completed the registrations

they never operated. Almost half the respondents believe that the conflict among members which led to cooperative failure was caused by deficient service to clients and poor management. Phillips (2003) maintains that factors that contribute to cooperative failure include but are not limited to poor management, lack of funds, lack of training and conflict among members. Failure of cooperatives may affect the way people think about the cooperatives, especially those who were members of those failed cooperatives.

The Democratic South African government which has been ruling since 1994 did not consider the Cooperative Act of 1981 as a suitable driver for the development of cooperatives in the present era because of some specific reasons such as; " inadequate definition of a cooperative – registered cooperatives are not explicitly required to conform with cooperative principles; presumption that the State plays a highly interventionist or paternalistic role in relation to cooperatives; focus primarily on agricultural cooperatives; provisions protecting members' interests, particularly in regard to the board of directors, are poorly articulated; and onerous requirements to register a cooperative" (RSA, 2005). Therefore, a new Act based on International principles was formulated in 2005. The Cooperative Act of 2005 (No. 14 of 2005) was officially gazetted by the South African Government on the 18th of August 2005 (RSA, 2005). This act allows different categories of cooperatives to be registered under it (primary, secondary and tertiary cooperatives). The Cooperative Act of 2005 recognizes:

- "the co-operative values of self-help, self-reliance, self-responsibility, democracy, equality and social responsibility;
- that a viable, autonomous, self-reliant and self-sustaining co-operative movement can play a major role in the economic and social development of the Republic of South Africa, in particular by creating employment, generating income, facilitating broad-based black economic empowerment and eradicating poverty;
- that the South African economy will benefit from increasing the number and variety of viable and sustainable economic enterprises;
- that government is committed to providing a supportive legal environment to enable cooperatives to develop and flourish".

The Act also aims to:

- "ensure that international co-operative principles are recognized and implemented in the Republic of South Africa;
- enable co-operatives to register and acquire a legal status separate from their members; and
- facilitate the provision of targeted support for emerging co-operatives, particularly those owned by women and black people" (RSA, 2005).

Doyer (2005) feels that since the Registrar of Cooperatives moved to the DTI, the agricultural sector has lost considerable intellectual and administrative capacity with regards to agricultural cooperatives. Yet, he still believes that it is now simple to establish and operate a cooperative under this new act.

Agricultural cooperatives, as noted in the preceding discussions, account for a significant portion of the cooperatives sector, and they are primarily located in rural areas. However, agriculture's contribution to South Africa's gross domestic product is small and diminishing, but it remains an important industry in terms of employment, the country's balance of payments, and other factors, provider of food and raw materials (Dube, 2016).

2.4.2. Background of South African agricultural sector and smallholder agricultural cooperatives in context of entrepreneurship

The basis for large scale commercial farming in South Africa was first laid between 1910 and 1980 by its government policy intervention, through legislations (Genis, 2012). Firstly, white and black farmers were segregated, followed by the facilitation of what's said to be 'orderly marketing'. According to Vink and Kirsten (2000), this intervention was followed by the establishment of interventions and direct subsidies which were meant to decrease the dependence of white farmers on black labour and also protect them from competitions which are from overseas. During the 1980s and early 1990s, white commercial farmers continued to receive financial assistance and subsidies totalling R3 912 billion. This was mostly utilized to purchase land, tools, and animals, as well as to consolidate debt, repair infrastructure, conduct emergency draught measures, and convert marginal land, among other things (Kirsten, Edwards & Vink, 2007). Genis (2012) asserts that the Acts that laid most of the foundation of the segregation of agriculture were, the Land Act of 1912, the Marketing Act of 1937, the Native Administration Act of 1927, the Co-operative Act Society Act of 1922 and 1939 and

the Land Act of 1913 and 1936, which were also a widespread system of support measures to white farmers.

After South Africa's first democratic elections in 1994 and the deregulation of agricultural markets in 1996, which transformed the agricultural sector into one that was transparent and receptive to global market trends, this privileged status disappeared (Genis, 2012). The withdrawal of government support produced a "uniquely unfavorable climate for new entrants," while the elimination of programs combined with the restructuring of the commercial farming sector produced "winners and losers." Land reform is the main focus of government policy since distorted land ownership patterns have led to centuries of dispossession. This will make amends for the past and alter ownership patterns. According to Section 25 of the Constitution, land policy mandates initiatives for land redistribution, restitution, and tenure reform (Genis, 2012).

According to Xaba (2014) the state acquired agricultural land aiming to restore properties in a reasonable manner to communities or individuals through land redistribution, who after the Native Act of 1913 were wrongly dispossessed of their land. On the other hand, the goal of tenure reform was to give those who occupied other people's land without secure land rights, such as agricultural labourers, former workers, sharecroppers, land residents, and land renters, a stable tenancy (Xaba, 2014).

The Department of Land Reform and Rural Development in South Africa has made it a priority to recapitalize as well as give development support to land reform recipients in rural areas so that they may increase their capacity for sustainable economic agriculture. The majority of rural farmers in most developing nations, including South Africa, have small landholdings, little resources, and 11 surplus labour. The population of farmers in developing nations was predicted to reach 1.32 billion in 2006. (FAOSTAT, 2006).

Despite making up less than 3% of South Africa's total gross domestic product (GDP), Xaba (2014) said that the agriculture sector nevertheless has a significant impact on the country's overall economy. The process of turning raw agricultural products into processed goods for sale is known as agro-processing, and it has the potential to offer entrepreneurs both business opportunities and substantial financial benefits. It has been discovered to decrease waste, improve food security, and improve low-income populations' quality of life (Meena, et al., 2009). For instance, in Sub-Saharan Africa, it is estimated that small-scale food processing employs 60% of the labour force.

According to (Venter, Urban & Rwigema, 2010), entrepreneurs in this industry encounter several hurdles, including the uncertainty surrounding access to funding, assistance, knowledge, and the existence of reliable markets. One of the most pressing issues confronting South Africa today is the growth and enhancement of its knowledge and skill base, particularly among historically disadvantaged and marginalized segments of the population.

Several studies have shown that most cooperatives found in the world are involved in the agricultural sector at some point (Hasen, 2009). In South Africa, the first group of cooperatives emerged in the beginning of the 19th century (Ortmann & King, 2007). Ortmann and Kings (2007) points out that the Cape province, Orange Free State, the Transvaal and Natal as the four main colonies where the white-dominating farmers created groups and organized themselves into societies until they formed what is now known as cooperatives. In the 1980s, these cooperatives hit their peak at 250, with the total membership of one hundred and forty-two thousand and a total turn-over of 22,5 billion rand's (Amin & Bernstein, 1995). These cooperatives were formed on the basis that they will make a significant contribution towards the equitable distribution of income, resource mobilization and also job creation (DTI, 2004). Similarly, Khumalo (2014) argues that it can be acknowledged that cooperatives can enhance human capital through the provision of training and development of members using programs which seeks to improve the efficiency of members.

In South Africa, there are quite some cooperatives that have shown exceptional progress (Tsholoba & BERG, 2015). Cooperatives such as the Heiveld Rooibos Cooperative which is based in Nieuwoudtville in the Hantam Karoo region of the Northern Cape. This cooperative was formally registered in 2001, with a total membership of 14 smallholder farmers, aiming to low price issues and poor market access as a challenge to smallholder farmers producing rooibos plants (Ortmann & King, 2006). Ortmann and King (2006) maintain that those farmers were inspired by the exceptional progress of this cooperative and noticed that they needed essential management and organizational skills for them to enhance their skills and farming knowledge. This shows the success of the cooperatives may rely upon the commitment of members and their prior knowledge and skills, and farmers needed to work together in order to address problems facing them as smallholder farmers.

2.5. Entrepreneurship skills that are required in the smallholder agribusiness sector

Duzkzkowska-Małysz (1993) asserts that farm entrepreneurship includes the overall activities that farmers need in order to operate in a free market economy. Recently, farmers in developed countries like Europe, for their survival in the ever-changing economy, are developing new skills and growing more functional capabilities, thus becoming more entrepreneurial (McElwee, 2006). According to Hanf and Müller (1997) a farm entrepreneur who is open-minded should be able to recognize more problems in a dynamic environment with fast technical progress than they are able to rationally solve. Hence, McElwee (2006) suggests that agricultural entrepreneurs should have the capacity to recognize problems before-hand and work around them up to a point where they could finally make a decision on how solve the problem, create and maintain personal cognitive requirements for problem-solving and decision-making, and allocate appropriate time to management and operational tasks.

According to Rudmann *et al*., (2008) skills are regarded as the proper way of executing duties in agribusiness. These skills are acquired as a result of the interplay between the environment and the individual farmer. Vesala (2008) asserts that entrepreneurship is considered to be a balanced concept which refers to both to the activity and as well as the individual. There is a greater need for skills which helps farmers to cope in the ever-changing environment, as it is difficult to survive under such complexity (Rudmann et al., 2008). Therefore, promoting entrepreneurial skills may contribute to the success of the farmers. The ability of farmers to develop their entrepreneurial skills is the main difficulty facing the agriculture sector, according to McElwee (2006). This necessitates financial assistance as well as a stronger focus on education and training. Rudmann et al., (2008) categorizes these skills into five categories: "Professional skill (technical skills, production skills), Management skills (financial management, administrative skills), Opportunity skills, (recognizing and realizing business strategy), Strategy skills (developing and evaluating a business strategy) and Co-operation/networking skills (networking and utilizing contact)". The authors further argue that the only entrepreneurial skills that were considered to be proper based on the scientific literature and also due to their complexity among others were the opportunity skills, strategy skills and the co-operation/networking skills (Rudmann *et al*., 2008).

Table 2.1: Entrepreneurship skills categories

Category	Measurement skills
1. Professional skills	✓ Plant production skills ✓ Technical skills
2. Management skills	✓ Financial management and administration skills ✓ Human Resource Management skills ✓ Customer management skills ✓ General planning skills
3. Opportunity skills	✓ Recognizing business opportunities ✓ Market and customer orientation ✓ Awareness of threats ✓ Innovation skills ✓ Risk management skills
4. Strategic skills	✓ Skills to receive and make use of feedback ✓ Reflection skills ✓ Monitoring ad evaluation skills ✓ Conceptual skills ✓ Strategic planning skills ✓ Strategic decision making skills ✓ Goal setting skills
5. Co-operation/ networking skills	✓ Skills related to co-operating with other farmers and companies ✓ Networking skills ✓ Team working skills ✓ Leadership skills

Source: Rudmann *et al*., 2008

According to Rudmann et al., (2008) entrepreneurial skills "are related to identification of business opportunities, finding means and resources to realize business opportunities by networking and co-operation, developing a business strategy and managing and improving the business". Furthermore, the results from the study showed that the respondents suggest that farmers needed mostly the professional skills in order to succeed in the farming business

(Rudmann et al., 2008). Even though many respondents think there is a need for farmers to become businessmen because of the complexity of the farming business. Vesala (1996) in a study of entrepreneurship pointed out that for one to understand the role played by entrepreneurs the values of economic individualism alone are enough. Furthermore, the most significant three dimensions in economic theories of entrepreneurship is risk taking, growth orientation and innovativeness (McElwee, 2005).

a) Risk-taking dimension

This dimension assumes an entrepreneur as a risk taker who takes thoroughly calculated economic risks, maximizes profit taking into consideration the degree of uncertainty and the consequences that may come about should there be a chance of failure.

b) Growth orientation dimension

The aim here is to maximize profit through diversification and expansion of business activities and growing the farm business. It assumes the dissatisfaction of the entrepreneur with earning their own living only, thus they are expected to aim for growth.

c) Innovativeness dimension

This involves searching, development and trying other products, markets, methods, etc. A proper entrepreneur is expected to be involved in a dynamic, active and progressive competitive economy, chasing the opportunities (Stanworth & Curran 1973; Carland et al. 1984; Stevenson & Jarillo 1991; Vesala 1996). Furthermore, McElwee (2005) highlighted management skills as the complete set of skills needed by the farmer to maintain and grow their farm businesses. The scope of the management and strategic planning is based on a score of fourteen factors: information about management, growth orientation, purpose driven, time strategy, objectives, certificates, aims for certificates, concern about the future, formulation of policy, business planning, social orientation, sales increases, financial conservative and measuring of performances. Therefore, spending little time on strategic and tactical management will result in a low score on management and strategic planning (McElwee, 2005).

2.6. Entrepreneurship on productivity and financial performance.

Entrepreneurship is a multidimensional concept, thus it is very difficult to measure it (Wang *et al*., 2015). It is also a multifaceted concept, because it has many definitions and a lot of proposed measurements (Iversen et al., 2008). Therefore, creating entrepreneurship framework will assist to come up with measurement methods that will help measure and improve

productivity and the financial performance of the agricultural cooperatives. Identifying the impact that entrepreneurship has on smallholder agricultural cooperatives will enable those cooperatives to explore the critical role of entrepreneurship on smallholder farmers' productivity and financial performance. A study by Heenkenda & Chandrakumara (2016) found out that there is an association between skill factors which includes collective action and cooperation, visionary, readiness to change and profit oriented nature, and the financial performance and the marketing performance. Additionally, this study's findings demonstrated that there was a substantial correlation between cooperative behaviour, openness to change, innovativeness, and farm output.

There has been an on-going argument of whether providing farmers with entrepreneurial skills would increase their profitability and income. Thus, argument is supported by theory of Schultz (1961) which is the human capital theory. This theory suggests that since education and training integrated in people has a positive impact on their productivity, these people could be used as capital assets that can possibly increase productivity similarly to physical capital assets. In brief, what this theory means is that farmers who possess entrepreneurial skills and other relevant farming skills should increase their productivity as opposed to those who do not. This theory does not necessarily highlight the specific skills farmers require to be regarded as entrepreneurs. Therefore, empirical research that examined the relationship between farmers' success (particularly financial performance) and their entrepreneurial skills are uncommon.

Weir (1999) conducted an empirical study on the effects of general education on farmer productivity in Ethiopia. With the education system in Ethiopia being low, he concluded that farmers benefited through this education with regards to the efficiency gains. The results further showed that farmers needed a minimum of four years of education in order for them to benefit from this education system. Having primary education sets to be an advantage to farmers, because chances that they could be implanted with additional skills were high if they were to be provided with.

Siriwardene and Jayewardene (2014) studied the social-demographic factors which contribute to the productivity in paddy farming in Sri Lanka. The results showed that the major contributing factor contributing to paddy productivity was the innovation and adoption of new practices. The basic dimensions of a success entrepreneur include the innovations and adoption of new practices, thus these findings show an association with the entrepreneurship of farmers.

The study conducted in Ghana by Anglo *et al*. (2014) also investigated the impact of entrepreneur and business traits on the profitability of cage fish farming. The findings of this study demonstrated a considerable association between profitability and managerial abilities, technical expertise, and work attitudes. According to Hanf and Müller (1997), referenced by McElwee (2005), only problem-solving farming entrepreneurs will be able to identify new problems. As a result, an agro-entrepreneur must be able to develop and maintain the cognitive side adequately so that they can allocate time to management and decision-making responsibilities, to mention a few.

Feder *et al.*(2004) pointed out that farmers with better knowledge use less pesticides in farming, moreover those who had the training in agriculture had a better chance of being successful in that regard. Their results also revealed that it here was no diffusion of knowledge, and that it was unlikely that those farmers who had the training could have passed knowledge to those who were not trained because most of the farmers are reluctant to pass on the information to their competitors, therefore this could have been a results of competition among farmers.

2.7. Conceptual framework and models of entrepreneurship

2.7.1. Conceptual framework of agricultural entrepreneurship

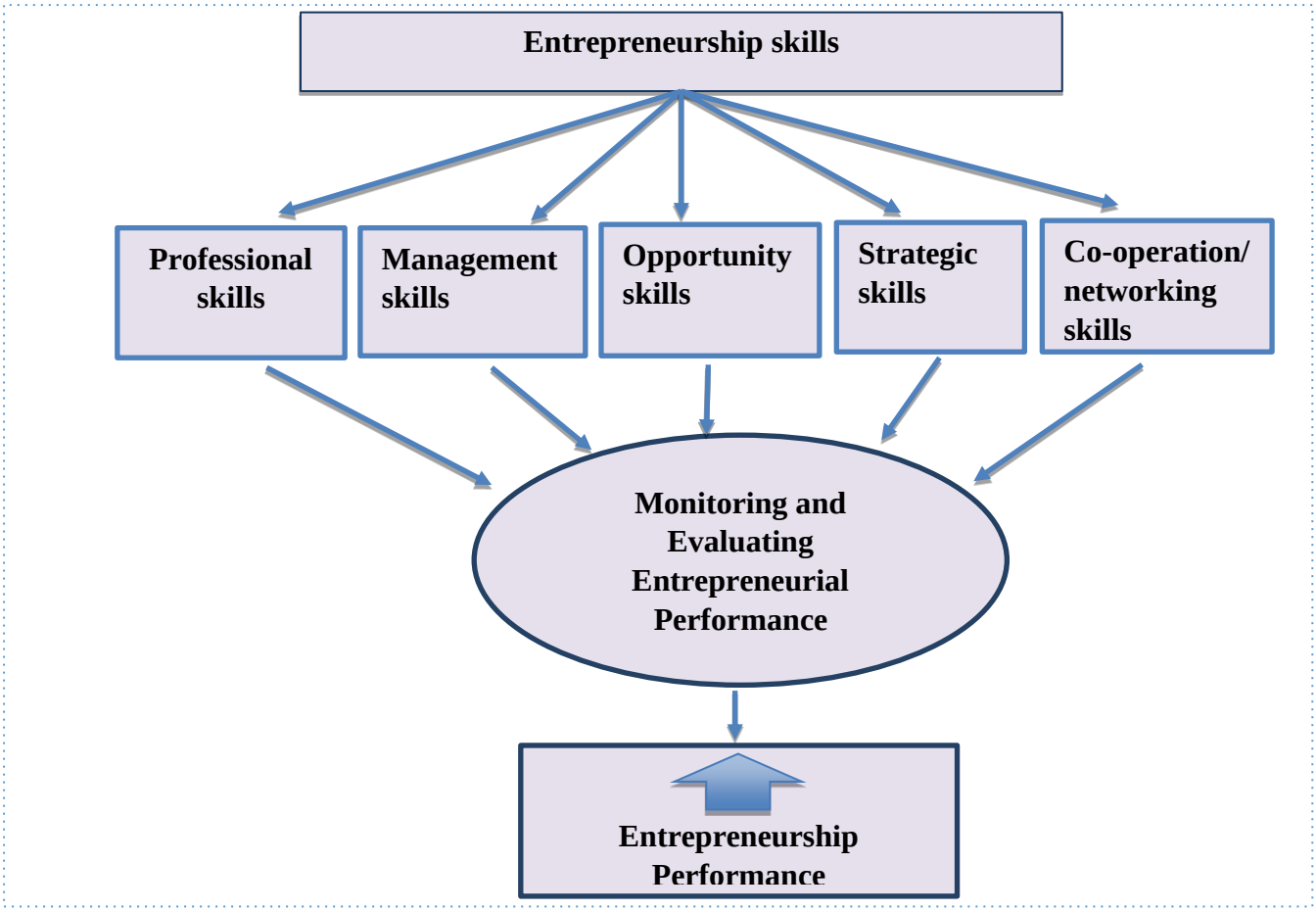


Figure 2.4: Conceptual framework of agricultural entrepreneurship

Source: Author, 2022

Figure 1 above represents a conceptual framework of agricultural entrepreneurship adapted from Kavari (2016), Modiba (2009) and Rudmann *et al.,* (2008). Components of the conceptual framework are elaborated below.

2.7.2. Entrepreneurship skills

As stated in the literature that entrepreneurship skills have the greater impact on entrepreneurship performance, thus this study regards entrepreneurship skills with a bearing on entrepreneurial performance such as: professional skills; management skills; opportunity skills; strategic skills; and co-operation/networking skills.

With regards to professional skills, Rudmann et al., (2008) suggests that farmers needed mostly the professional skills for their success in farming. These skills include plant production skills and technical skills. McElwee (2005) highlighted management skills as the complete set of skills needed by the farmer to maintain and grow their farm businesses. A score of fourteen elements is used to determine the management and strategic planning's scope: information

about management, growth orientation, purpose driven, time strategy, objectives, certificates, aims for certificates, concern about the future, formulation of policy, business planning, social orientation, sales increases, financial conservative and measuring of performances. Therefore, spending little time on strategic and tactical management will result in a low score on management and strategic planning (McElwee, 2005). This study regards management skills such as financial management and administration skills, human resource management skills, customer management skills and general planning skills.

Rudmann *et al.* (2008) asserts that the only entrepreneurial skills that are considered to be proper based on the scientific literature and also due to their complexity among others is the opportunity skills, strategy skills and the co-operation/networking skills. Opportunity skills includes "recognizing business opportunities, market and customer orientation, awareness of threats, innovation skills and risk management skills". Strategic skills encompass of "skills to receive and make use of feedback, reflection skills, monitoring ad evaluation skills, conceptual skills, strategic planning skills, strategic decision-making skills and goal setting skills". Whereas co-operation/networking skills includes skills related to "co-operating with other farmers and companies, networking skills, team working skills and the leadership skills".

2.7.3. Entrepreneurship performance

Performance is an indicator or a measurement used to evaluate or assess organizations, groups, individuals and firms (Kavari, 2016). According to Lucky (2011) performance can be categorized into two, "entrepreneurial performance and firm performance". Where entrepreneurial performance is the individual entrepreneur's performance, and firm performance basically refers to the performance of an organization and/or company, or sometimes both where they will be measuring the business performance (Lucky, 2011). This study advocates for the classification of business performance into two major groups: the cooperative performance and the farmers' performance. For the purpose of this study both concepts of performance will utilise two measurement indicators – productivity (efficiency) and financial performance. Venkatraman and Ramanujam (1986), maintains that business performance should be measured using both indicators of operational performance (non-financial) and indicators of financial performance.

2.7.4. Entrepreneurship outcomes

According to Kavari (2016), the by-products of entrepreneurial performance include increased income, improved living conditions for the farmers who benefit, and increased agricultural output. In this study, the financial performance and agricultural productivity will serve as indicators of entrepreneurship outcomes, which are also seen as by-products of entrepreneurial performance.

2.7.5. Monitoring and evaluation

This is motivated by Modiba (2009) and Kavari (2016) whom included the element of monitoring and evaluation, which can only be used for an explanatory research purpose only. This element has been previously identified by some researchers as a significant intervention (Lahiff, 2007; Ministry of Land and Resettlement, 2010; Wemer & Odendaal, 2010). In the context of this study, monitoring and evaluation is set to evaluate the cooperative performance level to allow for remedial interventions.

2.8. Models of entrepreneurship

2.8.1. Rezaei-Moghaddam & Izadi (2019)- Developing Entrepreneurship Index

The development of entrepreneurship is an ever-changing process, of which entrepreneurs should capitalize on the opportunities (Rezaei-Moghaddam & Izadi, 2019). A model of the entrepreneurship development process in small agricultural quick-impact firms was presented by Rezaei-Moghaddam and Izadi in 2019. According to this concept, environmental, personal, and enterprise-related factors all have an impact on the entrepreneurial process. According to the model, the process of entrepreneurship development is something that can never be completed by a single entrepreneur, by facilities and other support systems by themselves, or by the state that the business entity is currently now (Rezaei-Moghaddam & Izadi, 2019). According to Rezaei-Moghaddam and Izadi (2019) the only way entrepreneurship process would occur is when a dependent individual who possess innovation and creative skills manages to take advantage of the opportunities provided by the government to form a business, using his management skills which are relevant to entrepreneurship, and make use of supportive, incentive and educational policies.

2.8.2. Kavari Model (2016): Agricultural Entrepreneurship Development Model (AEDM)

Kavari (2016) developed an Agricultural-Entrepreneurial Development Model (AEDM) which aimed at enhancing entrepreneurial performance in the agricultural sector. This model highlighted that there is a positive and significant relation between Entrepreneurial Orientation

("risk-taking, pro-activeness, and technology and innovation") and Entrepreneurial Performance (EP), and non -significant relationship between Cooperative Environment ("culture, financial support, education and training, and market conditions") and EP. Furthermore, the study confirmed a non-significant relationship between Entrepreneurial Competencies (entrepreneurial skills, business skills, performance motivation, performance skills, and technical skills) and EP, and a positive and significant relationship between Agricultural sustainability (climate change, extension services and ecosystem, biodiversity and soil erosion) and EP. The literature that is available (Modiba, 2009; Surman et al., 2014; Zhou et al., 2013) confirms the lack of models for agricultural entrepreneurial growth and their inappropriateness.

2.9. Chapter Summary

Several studies show that ever since the cooperatives emerged in the 19th century, they have been playing a very vital role in farmers' productivity and profitability. With regards to entrepreneurship, most cooperatives in South Africa don't show much capacity or progress. Even though there are some cooperatives that have shown some exceptional progress in the agricultural sector. The agribusiness sector in South Africa is also underdeveloped, thus this stresses those commercial farmers that contributes to the country's economy through employment generation and development of the rural economy (Modiba, 2009). This study seeks to uncover the entrepreneurial skills that are required to enhance the entrepreneurial capacity of primary cooperatives in North West province.

CHAPTER THREE

RESEARCH METHODOLOGY AND ANALYTICAL FRAMEWORK

3.1. Introduction

This chapter provides a brief overview of the study area and its population and sampling size of the cooperatives. It also provides various aspect of methodology like the sampling techniques, data collection instruments and data analysis as per specific objective.

3.2. Overview of the study area

Ngaka Modiri Molema District of the North West province served as the study area (the central region). The Ngaka Modiri Molema District in the North West is 28 114 km2 in size and makes up 27% of the province's overall area. It has 885 737 residents, or 23% of the province's entire population. The five local municipalities that make up the district are Mahikeng, Ratlou, Ramotshere Moiloa, Ditsobotla, and Tswaing.The province is dominated by villages with less number of suburbs (Msimango & Oladele, 2013), and the capital city of the province is Mafikeng (Stats SA, 2018). Agriculture is the major provider of many households in the province and the main economic activity in the province is the production of livestock and crops. The province has 215 cooperatives under the agricultural sector and the highest number of cooperatives in the province are involved in livestock and crop farming, followed by mixed farming, poultry and vegetables (27%, 23%,14%, 14% and 14% respectively) (DAFF, 2015). Figure 3.1 illustrates five districts of Ngaka Modiri Molema district of the North West province which is the study area.

Figure 3.1: Map of Ngaka Modiri Molema District of the North West province

Source: SAWX, 2020

3.3. Research paradigm

The term paradigm as defined by Kuhn (1962), the American philosopher, means a philosophical way of thinking. Moreover, Otollila & Knipe (2006) asserts that the term can be used to support the researcher's 'worldview'. This worldview is regarded as the way of thinking, or the perspectives, or rather a set of shared beliefs that is supposed to provide a clear meaning or interpretation of research data. Researchers have proposed many paradigms, Candy (1989) grouped them into three main taxonomies, namely Positivist, Interpretivist and Critical paradigms. Comte (1856) suggests that the positivist paradigm defines "a worldview to research, which is grounded in what is known in research methods as the scientific method of investigation". It is used to explore observations and answer the questions. According to Fadhel (2002) it is considered as the scientific method and chosen as the preferred worldview for research. On the other hand, interpretivists' paradigm attempts to understand the subjective

worlds of human experience (Lincoln & Guba, 1989). In simpler terms this approach seeks to understand the viewpoint of the subject that is being studied and interpret the meaning of the context. The last paradigm, critical paradigm seeks to address issues such as political, social and economic issues (Guba & Lincoln, 1988). This study adopted both approaches, the positivist and constructivism paradigm. It will also adapt the quantitative and qualitative approaches.

3.4. Research approach

The study employed both qualitative and quantitative approaches/mixed methods. Mixed method or pragmatic approach is used when the researcher uses both qualitative and quantitative data sequentially. This allowed testing of hypothesis (using qualitative data) and exploration of ideas in depth (using qualitative data). The study includes both open-ended and closed-ended data. According to Flick (2018) data obtained from quantitative research leads to results in the actual sense of the word, on contrary qualitative research is based on illustrations.

3.5. Research design

Research design is defined as the plan for choosing subjects, research sites, and data collection processes to answer the research questions (Mafuwane, 2011). For a researcher to attain aims and objectives of the study, the applicable and appropriate research design must be chosen. The study developed an entrepreneurship framework which aimed at increasing productivity and financial performance of smallholder agricultural cooperatives in the North West province. To achieve this a quantitative and qualitative (descriptive) research approach were adapted. Quantitative research is said to be a type of empirical research into a social phenomenon or human problem, testing a theory consisting of variables which are measured with numbers and analysed with statistics in order to determine if the theory explains or predicts phenomena of interest (Labaree, 2009). Mazibuko (2013) prescribes a descriptive study to be used in such studies because it provides an accurate number of characteristics (i.e. behaviour, opinions, beliefs, abilities, and knowledge of an individual). Due to limited timeframes and budgets; the study was based on a cross-sectional design. The survey that was compiled was based on the questionnaires distributed amongst smallholder agricultural cooperatives managers. A single method research approach was adopted for the purpose of this study.

3.6. Population, sample and sampling techniques

3.6.1. Population

A population is defined as any group which forms the subject of research interest (Goddard & Melville, 2004). Similarly, Alvi (2016) defines population of the study as a group of elements whether individuals, objects or events that confirm specific measures to which the researchers intend to generalize the research results. The population of elements that makes up the target population is referred to as the population under investigation for particular characteristics (Stoker, 1988) The cooperative managers of the smallholder agricultural cooperatives (crops) in the Ngaka Modiri Molema District of the North West province, were the study's target population. Due to limited resources and underdeveloped Departments of Agriculture, the complete population sie of the smallholder agricultural cooperatives in the province could not be obtained. The researcher only managed to obtain a list of 365 smallholder agricultural cooperatives (crops, animals, finance, marketing, and others) from the Cooperative Data Analysis System (CODAS) from the Department of Agriculture and Rural Development . The list was outdated as most of those cooperatives were no longer operational and some could not be reached. Therefore, the study was conducted on those cooperatives who could be reached and were operational.

3.6.2. Sampling technique

There are two types of sampling: probabilistic sampling and non-probabilistic sampling. In this study, the most suitable sampling technique is the directed sampling technique, which is part of the non-probabilistic sampling technique. The advantage of using this nonprobability sampling method is that it does not require population data. Therefore, the sample selected does not necessarily have to be representative of the population. The study employed non-propalistic sampling technique. The non-probalistic technique used was a purposive sampling, which is a sampling technique in which researchers use discretion to select members of a target population to include in the sample. Smallholder agricultural cooperatives (crops) that were sampled were selected on a purposive manner, because there was no complete sampling frame and a complete and updated list of agricultural cooperatives of the province in the Cooperatives Data Analysis System (CODAS) system.

3.6.3. Sample size

The sampled municipalities were selected based on their intensity in the agriculturalsector within the district. Three of five municipalities were selected due to limitations which includes,

distance, timeframe and budget constraints. The study employed a multi-stage sampling method to help select the cooperatives purposively. The list of primary agricultural cooepratives was obtained was obtained from the cooperative databased obtained from the North West Province Department of Agriculture and Rural Development. There was no complete sample frame, the respondents were either located through addresses (when available on the list) or through telephonic calls (when telephone numbers were recheable). Only 43 cooperatives were reached, although, not all of them were crop cooperatives and operational, and out of that number 29 of them focused strictly on crop cooperatives and they were willing to participate in the research project.

3.6.4. Data collection instruments

Primary data was collected using a semi-structured questionnaire to obtain both qualitative and quantitative data. Unlike an unstructured questionnaire, which has open-ended questions, a structured questionnaire has closed questions (Cooper & Schindler, 2008). This questionnaire, which had both open-ended and closed-ended questions, was admistered both by face to face interviews and telephonic interviews, due to Covid-19 restricts that were imposed on the country. Some of the cooperative managers could not be reached due to distance and availability, therefore, the questionnaires had to be administered through telephonic calls. The questionnaire also employed Likert-type scales and a five-point response format. Respondents were asked to rate their level of skill on a scale of 1 to 5, with 1 representing no skill at all and 5 denoting very high proficiency. The Likert scale, according to Kavari (2012), is the most effective method for gauging people's attitudes, conceptions, pictures, perceptions, and views.

The study used secondary sources such departmental reports and other forms of relevant publications. It ensured that the publications from other authors which are included in the study were fully acknowledged. The study used enumerators to help with data collection since the study area is large. There was a pre-testing done before to test the questionnaire, and it was administered on 10 individuals. Before each interview, the participants were made aware of the fact that they were not forced to participate in the study and that their names and information they provided will be kept in total discrete and confidential. Instructions and questions were read for them to make sure that they fully understand, in their preferred language. Those who had the difficulty in completing the questionnaire on their own due to their illiteracy, they were profoundly assisted by enumerators.

3.7. Data analysis

Data collected from the study sample was organized in a format suitable for analysis. The responses from the respondents were captured using Microsoft excel, thereafter exported to STATA 15 analytical software.

3.7.1. Descriptive Analysis

3.7.1.1. To describe the nature and characteristics of smallholder agricultural cooperatives in the North West province.

It is very important to understand the nature and characteristics of smallholder agricultural cooperatives found in the North West province. This will explore the cooperative specificity and its importance on the provincial agricultural sector, and also to examine the nature of cooperative membership (Tortia *et al*., 2013; Ollila *et al*., 2012). This objective explored factors such as the characteristics of the cooperative and of the cooperative managers (number of members, number of years since the establishment, education level of the manager, age of the manager, sex, type of crops produced, etc.), factors of production (labour, land and capital) and availability support services (extension services, market segments, etc.).

In order to describe the nature and characteristics of smallholder agricultural cooperatives in the North West province, the primary data was gathered using a structured questionnaire. The cooperatives' databases were used to get the information. To highlight the nature and traits of the cooperatives from the perspectives of agricultural cooperative managers, the study adopted a descriptive analysis approach. The results are presented using the general frequency distribution and the summary of the descriptive statistics such the computation of means, standard deviation, percentages and frequencies and are illustrated using graphs, charts and tables. The use of descriptive analysis allows for a simple representation a raw data in a meaningful way, such as illustrating age distribution of the cooperative managers in a bar graph or tabulating their sex variables.

3.7.2. Inferential Analysis

3.7.2.1. To assess the current level of productivity and financial performance of smallholder agricultural cooperatives.

a) Current level of productivity

The study used technical efficiency to measure productive efficiency (productivity) of smallholder agricultural cooperatives. Technical efficiency the farm's ability to maximize output using a given set of resources inputs (Chirwa, 2007). The approach that was adopted to

measure productive efficiency in these cooperatives was the stochastic frontier approach. The stochastic production frontier model was first proposed by Aigner *et al.*, (1977) and Meeusen and van de Broeck (1977). This model is defined as follows:

$$\ln(Y) = \ln(\alpha) + \ln(\beta_1)X_1 + \ln(\beta_2)X_2 \dots\dots + \ln(\beta_n)X_n \quad \ldots.(1)$$

Where:

ln= Natural logarithmic

Y= Quantity of crops produced in Kg's

$\alpha, \beta_1, \beta_2 \dots\dots, \beta_n$ = Parameters to be estimated

$X_1, X_{2,} \dots\dots., X_n$ = Farm inputs used in Kg's

Vi = Random variables that are presumed to be independent of Ui.

Ui = non-negative random variables.

Free rider problem is referred to "as the situation where non-members of a particular institution or cooperative enjoys the benefits associated with the provision of public goods by the cooperative (e.g., higher commodity prices), but avoids becoming a member- and thus eschews contributing to the costs associated with this provision, which are incurred by members alone" (Iliopoulos, 2009). The solution that was adopted was to "Increased social consciousness" with regards to the reference group, thus increasing other-regardingness and avoiding the free rider problem (Iliopoulos, 2009).

b) Financial performance

To measure the financial performance among smallholder agricultural cooperatives, the study used three categories of financial ratios (liquidity, solvency & profitability). Liquidity determines the ability of a farm to meet obligations as they come, solvency assesses the farm ability to pay all of its debt, whereas profitability is calculated as the difference between value and cost of goods produced. Below is the list of financial ratios used to assess the financial performance of farms/firms (Delen *et al*., 2013)

I) Liquidity ratios

a) Liquidity/Current Ratio = Current Assets ÷ Current Liabilities
b) Quick ratio = (Current Assets – Inventory) ÷ Current Liabilities
c) Net working capital to sales ratio = (Current Assets- Current Liabilities) ÷ Sales

II) Solvency Ratios

a) Leverage Ratio = Total Liabilities ÷ Owner's Equity

b) Debt Ratio = Total Liabilities ÷ Total Assets

III) Profitability Ratios

a) Gross Profit Margin = Gross income ÷ Sales

Furthermore, after calculating financial ratios the study used the Banker, Charnes, Cooper (BCC) (Banker *et al.*, 1984) version of the Data Envelopment Analysis (DEA) model to assess the current level of financial performance of the smallholder agricultural cooperatives. DEA is an efficient frontier technique used to compute a comparative ratio of weighted outputs to weighted inputs for each decision-making unit (DMU) using linear programming (Avkiran, 2011). One unit of efficiency in this model is the ratio of the weighed sum of outputs to the weighed sum of inputs. Therefore, in this model, DMUs are evaluated in their best conditions, i.e.. best prices are assigned to input and output weights. DEA models uses non Achimedean numbers for weights, which would guarantee positive input and output weighs. The linear program scales the relative efficiency estimate between 0 and 1, thus enabling easy comparison, where 1 represents an efficient operation relative to others in the sample, and a DMU with a score less than 1 is defined as inefficient. The ratio form of the BCC model is as follow:

maximize …. (2)

subject to $1 \geq = \frac{\sum_{r=1}^{s} u_r y_{ro} - u_o}{\sum_{i=1}^{m} v_i x_{io}}$ …. (3)

$\epsilon \leq \quad h_o,$ …. (4)

$\epsilon \leq \quad \frac{\sum_{r=1}^{s} u_r y_{rj} - u_o}{\sum_{i=1}^{m} v_i x_{ij}}$ …. (5)

j = ~~1, …, n;~~ *r = 1, …, s; and i = 1, …, m.*

$\frac{u_r}{\sum_{i=1}^{m} v_i x_{io}}$

$\frac{v_r}{\sum_{i=1}^{m} v_i x_{io}}$

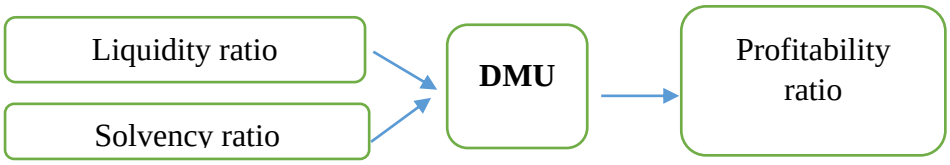


Figure 3.2: DEA variables

Source: Tehrani, *et al.*, (2012)

The variable:

h_o is the performance rating sought for primary cooperative 'o' which is the member of the data set, j = 1, …, n, that is to be evaluated relative to the other cooperatives included in the data set.

u_r signifies the virtual weights for each type of output r which will be determined by solving the model.

v_r is the virtual weights for each type of input i which will be determined by the solution of the model

u_o is the variable that effectively allows variable returns to scale in the cooperative under evaluation and is determined from solving the model.

y_{ro} is the observed amount of output r produced by cooperative o during the of observation.

x_{io} is the known amount of input i used by cooperative o during the period of observation

y_{rj} is the observed amount of output r produced by cooperative j during the period of observation

x_{ij} is the known amount of input i used by cooperative j during the period of observation

ϵ is the non-Archimedean infinitesimal constant that effectively allows the maximization.

Table 3.1: DEA variables

Output	**Inputs**
Profitability ratio	Liquidity ratio

	Solvency ratio

Source: Tehrani, *et al.,* (2012)

3.7.2.2. To determine the relationship between entrepreneurship skills of cooperative managers and the cooperative performance

To determine the entrepreneurial skills required by primary cooperative members in order to enhance the cooperative performance from the managerial point of view, canonical correlation analysis was performed. The canonical correlation is the multivariate analysis of correlation. This analysis will explore the relationship between two sets of variables, which is the entrepreneurship skills of cooperative managers and the corporate performance. The questionnaire was carried out on the cooperative managers, since they are the people responsible for disseminating information and educating the corporate members, and they also accountable for the performance of the cooperatives. The study used a five-point Likert scale to measure the entrepreneurship skills of cooperative members. This was done by asking respondents to score the skills on a scale of 1 to 5, with 1 denoting not at all skilled, and 5 denoting very skilled. Kavari (2012) reports that the Likert scale (Likert, 1932) is the most useful tool to use when measuring people's attitudes, conceptions, images, perceptions and opinions. Likert scale (1932) proposed a summated scale to sum individual item scores for the assessment of survey respondents' attitudes (Kavari, 2012).

The extent of the relationship between the predictor variable set of entrepreneurship skills variables and the dependent variable set of cooperative performance (productivity and financial performance) variables of smallholder agricultural cooperatives was assessed using the canonical correlation analysis. The two dependent variables (productivity and financial performance) was obtained from the above objective (objective 2) of the study.

I) Canonical Correlation Analysis

The canonical correlation studies the relationship between two sets of variables.

$(X_1, \ldots, X_r)$ and $(X_1, \ldots, X_s)$ …. (6)

It requires that each set of variables should be reduced to a single variable, thereafter find their correlation. These variables can be found by forming linear combinations of the variables in

each set, under certain pre-fixed criteria. The obtained variables from the linear combinations are known as 'canonical variables' and the correlation between them is known as 'canonical correlation'.

Suppose:

(X_{1i}, X_{2i}) for i = 1, …, n i.e we have n × (r + s) data matrix.

Let there be r- variables in the 1st group: $X_1 = (X_1, \ldots, X_r)$ and …. (7)

s-variables in the 2nd group: $X_2 = (X_{r+1}, \ldots, X_{r+s})$ …. (8)

Assume without loss of generality: r ≤ s.

Also let,

$E(X_1) = \mu_1$ and $E(X_2) = \mu_2$ …. (9)

Var $(X_1) = \sum_{11}$, Var $(X_2) = \sum_{22}$ and Cov $(X_1, X_2) = \sum_{12}$ …. (10)

Define: m = r + s

X = …. (11)

$(X_1\ X_2)$

E(X) = and …. (12)

$(\mu_1\ \mu_2)$

Cov (X) = …. (13)

$\begin{pmatrix} \sum_{11} & \sum_{12} \\ \sum_{21} & \sum_{22} \end{pmatrix}$

$\sum_{12}$ contains rs elements which gives the correlation between each variable of set 1 with those of set 2

For r and s dimensional coefficient vectors **a** and **b,** define

U = a'X_1 and V = b'X_2 …. (14)

Then Var (U) = a'$\sum_{11} a$, Var (V) = b'$\sum_{11} b$ …. (15)

and Cov (U, V) = a'$\sum_{11} b$ …. (16)

so that Corr (U, V) = …. (17)

$\frac{a'\sum_{11} b}{\sqrt{a'\sum_{11} a}\sqrt{b'\sum_{22} b}}$

The 1st pair (U_1, V_1) are so chosen as to maximize Cov (U, V), while the 2nd pair (U_2, V_2) are chosen to maximize Cov (U, V) subject to their combinations being orthogonal to the 1st choice.

In general, the j^{th} pair (U_j , V_j) are chosen to maximize Cov (U, V) subject to their combinations being orthogonal to the previous (j-1) choices.

This can be done till j = r

Therefore, (U, V) are canonical variables, where U = a'X_1 and V = b'X_2 …. (18)

X_1 represents cooperative performance variables (Financial performance and Productivity), whereas

X_2 represents the entrepreneurship skills (Professional skills, Management skills, Opportunity skills, Strategic skills and Co-operation/Networking skills)

"a" and "b" are coefficient vectors.

Table 3.2: Model specifications for Canonical Correlation Analysis

Variables	Description	Unit of measurement	Exp. sign
Dependent variables			
Productivity Financial Performance			
Independent variables			
Professional skills	1= not at all skilled 2= slightly skilled 3= moderately skilled 4= skilled 5= very skilled	Scale variables: Ordinal scale	+/-
Management skills	1= not at all skilled 2= slightly skilled 3= moderately skilled 4= skilled 5= very skilled	Scale variables: Ordinal scale	+/-
Opportunity skills	1= not at all skilled 2= slightly skilled 3= moderately skilled 4= skilled	Scale variables: Ordinal scale	+/-

	5= very skilled		
Strategic skills	1= not at all skilled 2= slightly skilled 3= moderately skilled 4= skilled 5= very skilled	Scale variables: Ordinal scale	+/-
Co-operation/ Networking skills	1= not at all skilled 2= slightly skilled 3= moderately skilled 4= skilled 5= very skilled	Scale variables: Ordinal scale	+/-

Source: Author contructed, 2022

II) Robustness test

This analysis provides an approach to the structuring of problem situations in which uncertainty is high, and where decisions can or must be staged sequentially (Rosenhead, 2001). Robustness analysis focuses mainly on how the distinction between decisions and plans can be exploited to maintain flexibility. Robustness will help choosing the best alternatives which are acceptable options without having some basic estimation problems. Therefore, this study performed a robustness test.

3.7.2.3. To develop an entrepreneurship framework which is aimed at improving productivity and financial performance of smallholder agricultural cooperatives

This study develops an entrepreneurship framework for smallholder agricultural cooperatives, and to achieve this objective, the study had use the literature and models of entrepreneurship development to assist with the development of this framework. Furthermore, the results that was obtained from objective three was used to aid in the development of the framework. The results include the entrepreneurship skills which are required to enhance the performance of the smallholder agricultural cooperatives in the North West Province.

Canonical correlation analysis is the statistical technique which was adopted for data analysis in this study. This analysis was done in objective three, and therefore all the entrepreneurship skills which proved to have a significant relationship with the primary agricultural cooperative performance was therefore adopted in the framework. The analysis studies the relationship

between two sets of variables; thus it determines the extent of the relationship. It includes the predictor variable set and the dependent variable set. The predictor variable set consists of the entrepreneurship skills, whereas the dependent variable set includes cooperative performance which is made up of profitability and financial performance. Entrepreneurship skills are categorized into five categories namely, Professional skills, Management skills, Opportunity skills, Strategic skills and Co-operation/ Networking skills. This study adopted the skills categories by Rudmann *et al.*, 2008).

Table 3.3: Entrepreneurship skills categories

Category	**Measurement skills**
Professional skills	✓ Plant production skills ✓ Technical skills
1. Management skills	✓ Financial management and administration skills ✓ Human Resource Management skills ✓ Customer management skills ✓ General planning skills
2. Opportunity skills	✓ Recognizing business opportunities ✓ Market and customer orientation ✓ Awareness of threats ✓ Innovation skills ✓ Risk management skills
3. Strategic skills	✓ Skills to receive and make use of feedback. ✓ Reflection skills ✓ Monitoring ad evaluation skills ✓ Conceptual skills ✓ Strategic planning skills ✓ Strategic decision-making skills. ✓ Goal setting skills
4. Co-operation/ networking skills	✓ Skills related to co-operating with other farmers and companies. ✓ Networking skills ✓ Team working skills.

	✓ Leadership skills

The developed entrepreneurship framework for smallholder agricultural cooperatives is illustrated below and is read from top to bottom according to the direction of the arrows:

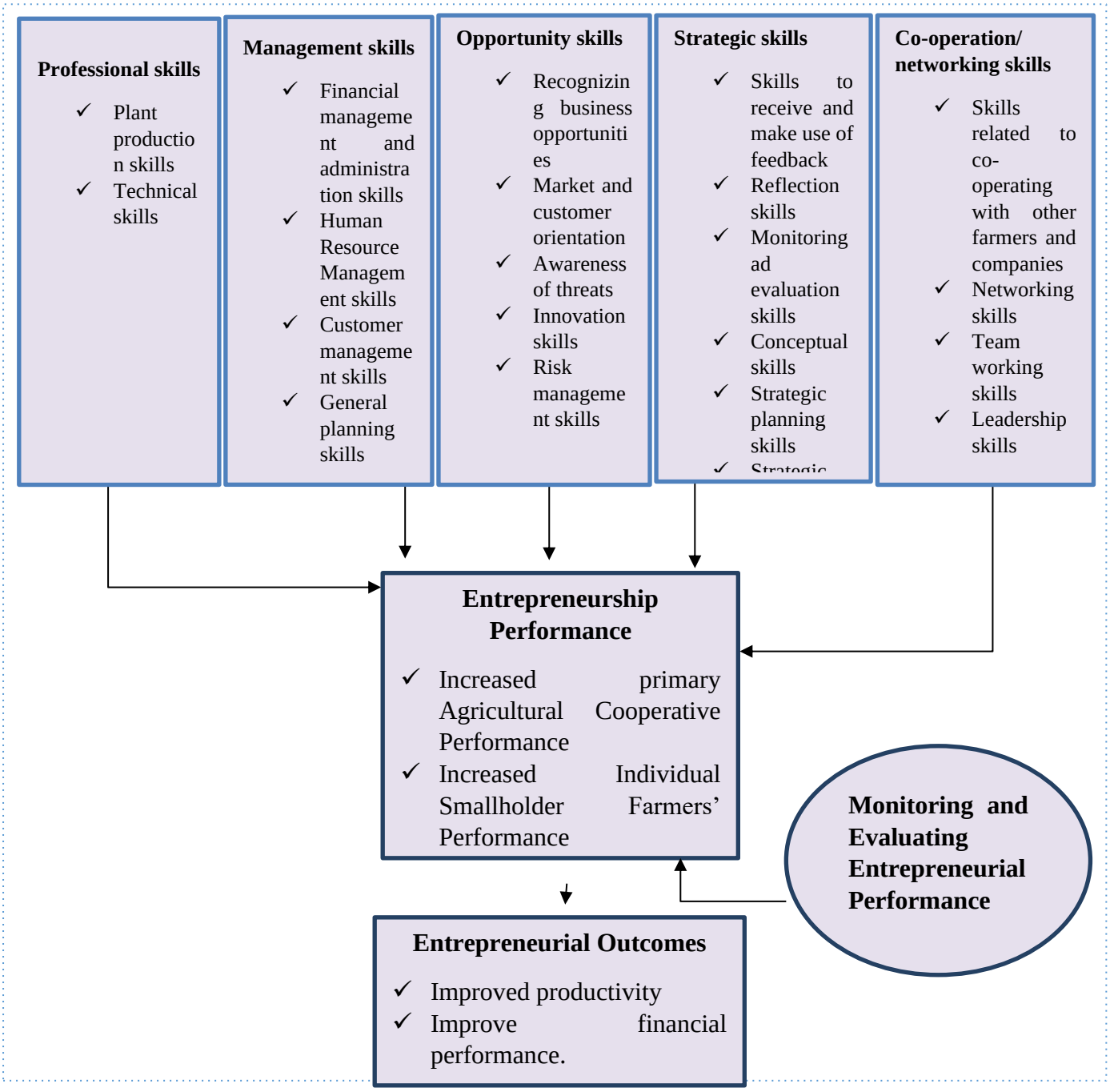


Figure 3.3: Proposed entrepreneurship framework

Source: Author, 2022

3.8. Chapter summary

The methods that were employed to analyse the collected data were discussed and presented in this chapter. The study was conducted in Ditsobotla, Mafikeng and Tswaing municipality in North West province. The method that was used to collect data from the sampled cooperative managers was questionnaires. This questionnaire was administered to the selected sample of cooperative managers to collect information needed for the study, which included both open and closed ended questions. Telephonic calls and face-to-face interviews were administered to collect the data. Microsoft excel 2016 was therefore used to capture the collected data. Moreover, to analyse the data, the study employed descriptive statistics, Data Envelop Analysis, stochastic frontier model and canonical correlation model. The statistic programs that were used was STATA 15 and Data Envelop Analysis Program.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.1. Introduction

This chapter presents the interpretation of the analysed data. Firstly, the study employed a descriptive statistical analysis to obtain the demographic information of the agricultural crop cooperative's managers of Mafikeng, Tswaing and Ditsobotla local municipality of the North West Province is presented using the descriptive statistics, so that the findings are interpreted.

Secondly, to assess the current level of productivity, the stochastic frontier model is used in order to measure the technical efficiency of the sampled cooperatives, and to assess the current level of financial performance of the sampled smallholder agricultural cooperatives financial ratios will be used and interpreted.

Thirdly, canonical analysis results of the sampled data will be discussed, followed lastly by the estimation of the framework according to the results obtained in relation to the stated hypothesis.

4.2. Descriptive statistical analysis

The study employed the descriptive statistical analysis in order to obtain a profile of the demographic information of the sampled smallholder agricultural cooperatives, such as age, sex, marital status, past working experience, highest qualification and entrepreneurship alertness of cooperative managers. Furthermore, the socio-economic characteristics of the primary cooperatives will also be presented in this section.

4.3. Demographic information

Demographic information assists to determine the extent to which they influence the managers' response in the study. The demographical information that is discussed in this section includes age, sex, marital status, past working experience, highest qualification and entrepreneurship alertness. Table 4.1 shows the demographic information of cooperative managers.

Table 4.1: Demographic information of sampled cooperatives' managers

	Frequency	Percentage
Sex		
Male	18	62.07
Female	11	37.93

Marital Status		
Single	8	27.59
Married	6	20.69
Divorced	5	17.24
Widowed	10	34.48
Past working experience		
Unemployed	0	0.00
Self-employed	4	13.79
Worker	4	13.79
Farm worker	12	41.38
Supervisor	6	20.69
Middle management	3	10.34
Top management	0	0.00
Other	0	0.00
Period(years) in current position		
1-2 years	10	34.48
3-6 years	14	48.28
7-10 years	5	17.24
10+ years	0	0.00
Highest qualification		
No qualification	0	0.00
Primary school completed	14	48.28
High school completed	3	20.69
Post Grade 12 certificate	5	17.24
Post Grade 12 diploma	0	0.00
University degree	3	10.34
University Post Grade degree	1	3.45
Other	0	0.00
Entrepreneurship alertness		
Alert	5	17.24
Non alert	24	82.76

Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022.

4.3.1. Age

Cooperatives hire managers or management team for them to run and administer the daily operations of these cooperatives and to implement the cooperative policies (Adrian and Green, 2001). Therefore, cooperative managers' age can be used as an alternative to describe his/her farming experience. In another words, age of the manager is significant because it will describe if whether the cooperative benefits through the older persons' experience or through their decisions on the risk-taking attitudes of younger farmers (Christian, 2014). Figure 4.1 below shows the age distribution of the interviewed cooperative managers. The results from Figure 4.1 show that there is only one manager (3.45%) who is considered to be youth (less or equals to 35 years of age), moreover, the results show that the cooperative managers have age distribution between 30 years and 70 years. Most of the managers are between ages of 45 and 60 years and there is an equal distribution between those who are <45 years and those who are >60 years of age. The findings of the study suggest that managers of agricultural crop cooperatives are mostly older persons. Furthermore, the study also suggests that to be a manager in cooperative you should have adequate experience, and young people of this district are not interested in participating in agricultural activities. Correspondingly, the study by Gotyi (2019), confirms that most of the cooperatives are usually formed by pensioners. Therefore, this explains why most of the cooperative members are older persons (between age 45 and 60).

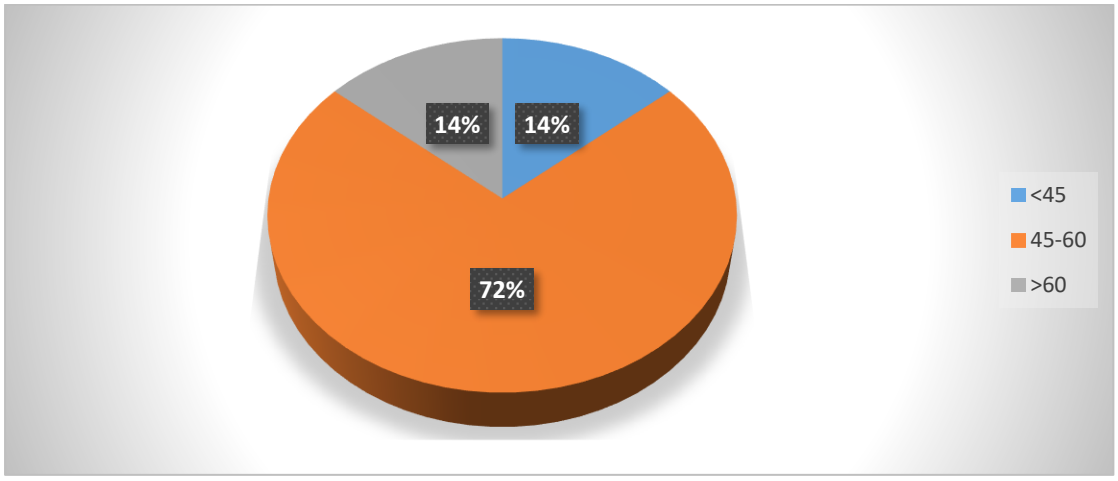


Figure 4.1: Age distribution
Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022.

4.3.2. Gender

According a study conducted by Black (2020), the results from the interviewed participants suggest that women entrepreneurs lack confidence and self-believe. Therefore, this might hinder most women's success in being businesswomens and entrepreneurs. Table 4.1 outlines the distribution of gender for the sampled agricultural cooperative managers. The results are also presented in figure 4.2 below.

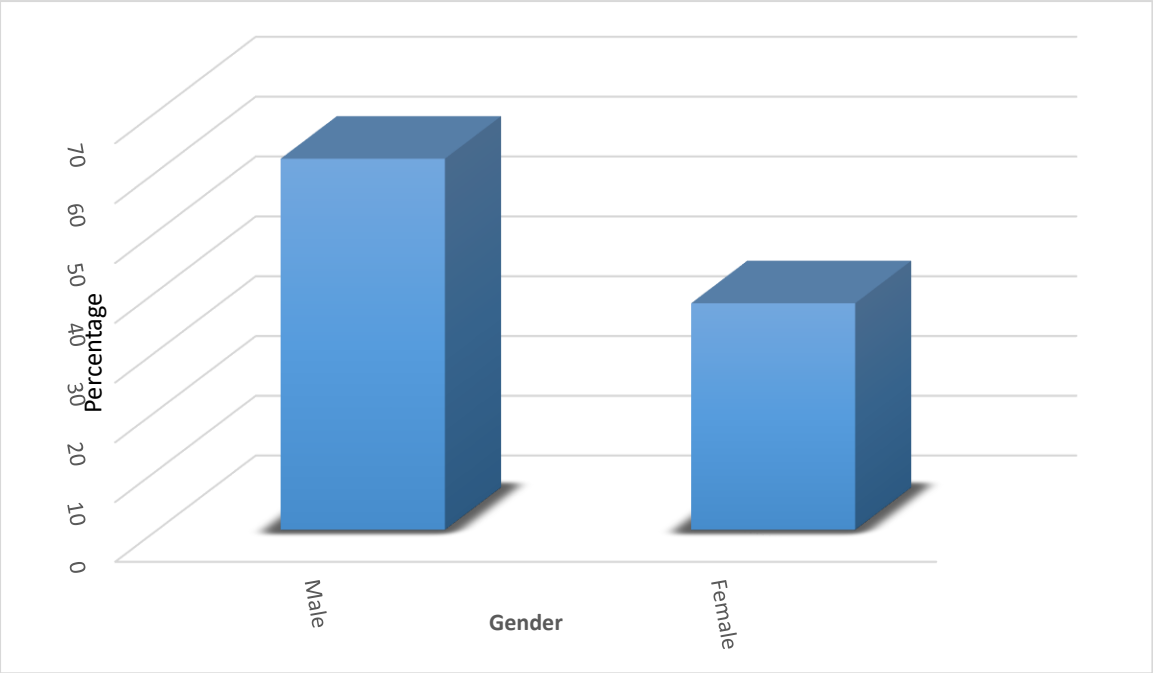


Figure 4.2: Gender distribution.
Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022.

Regarding the distributing of gender as illustrated in figure 4.2, the majority of the respondents were males. As table 4.1 demonstrates, 62.07 % of respondents were male and 37.93 % were female. This can be attributed to the fact that the most gender that is active in agriculture are males (Statssa, 2021); therefore, most of the respondents were likely to be males. This suggests that most females are not interested in participating in the role of being a cooperative manager in the study area.

4.3.3. Marital status

According to Christian (2014), the marital status of the home is frequently used to determine the stability of the household in African families. It is commonly assumed that married family heads are more stable agents than unmarried heads when it comes to agricultural pursuits. If

this is correct, the marital status of household heads will affect agricultural productivity and thus marketing. Table 4.1 and figure 4.3 below presented the results.

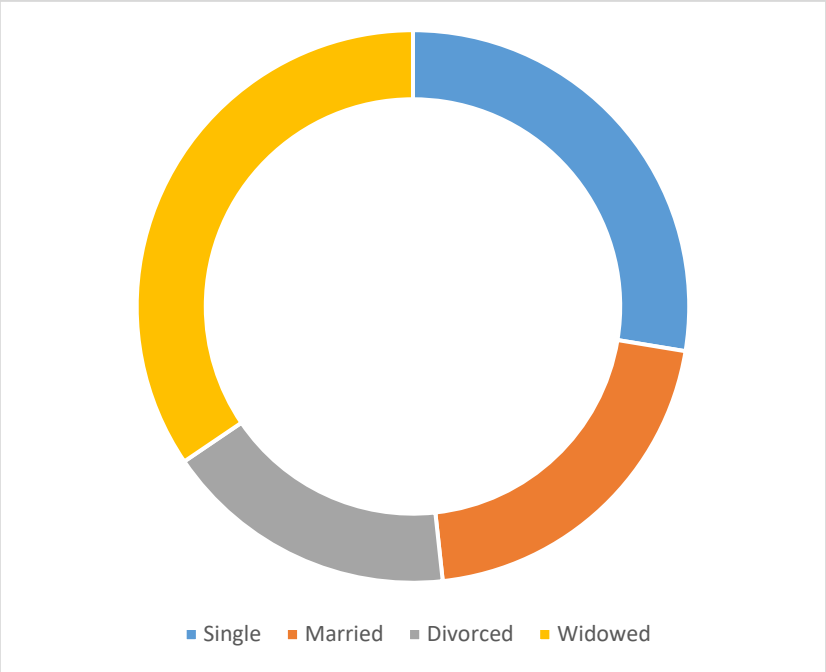


Figure 4.3: Marital status. Source:

Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022

According to the results, there are four main groups namely single, married, divorced and widowed. According to figure 4.3, the majority of the managers are widows (34.48%), which may imply that they are old people who were married at one point in time. This figure was followed by one of 27.59% for people that were single, and 20.69% for married managers and lastly 17.24% for divorced managers. This is in contrast with the results obtained from Modiba (2009), which claim that the majority of the people who participate in agriculture were married and not widows.

4.3.4. Past working experience

The results in table 4.1 outline different working experience of cooperative managers post their current employment. Furthermore, figure 4.4 below shows that majority (41.38%) of managers were working as farm workers before they could be cooperative managers. Then they are followed by those that were supervisors at 20.69%, self-employed and working class both at 13.79%, and lastly, 10.34% of those farm managers were once working in middle management. This implies that most of the managers had prior experience of farming before they could be managers of cooperatives.

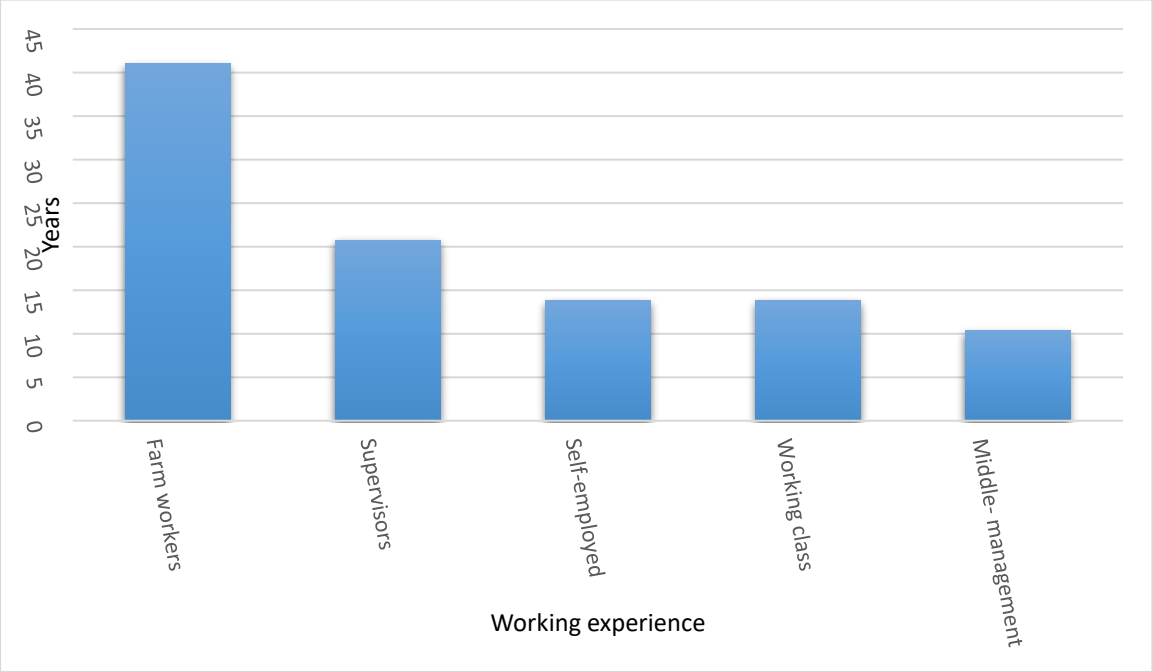


Figure 4.4: Past working experience of cooperative.
Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022

4.3.5. Period in current position

Figure 4.4. shows an illustration of years that managers held their current positions at various cooperatives. The majority (48.28%) of the managers have been in those cooperatives for about 3-6 years, followed by those that has between a year and two at 34.48% and lastly they are followed by those whose experience lies between 7 to 10 years. None of the cooperative managers have more than 10 years at their current positions. The findings of this study suggests that most of the cooperatives have continued to be operational since most of the managers have held their current positions.

4.3.6. Highest qualification

The results from Table 4.1 showing the demographics of the crop cooperative managers shows that majority (48.28%) of the managers have completed primary school grades, and this should be a major concern that most of the people that are managing cooperatives does not necessarily have necessary skills and academic knowledge. The majority is followed by those who have Post grade 12 certificates, those who completed high school and those who have a university degree at 17.24%. This is line with Gotyi (2019), where the author asserts that cooperative

education and training is not taken serious in South Africa, and there's only one University that offers a 3 year formal qualification on cooperative management which is University of KwaZulu-Natal (UKZN). This explains why most of the cooperative managers have highest qualifications which are lower than Post grade 12 certificates.

4.3.7. Entrepreneurship alertness

The results from table 4.1 shows that majority of the cooperative managers are not alert when it comes to entrepreneurship, 82.76% of the managers are not alert when it comes to entrepreneurship, while 17.24 % are alert.

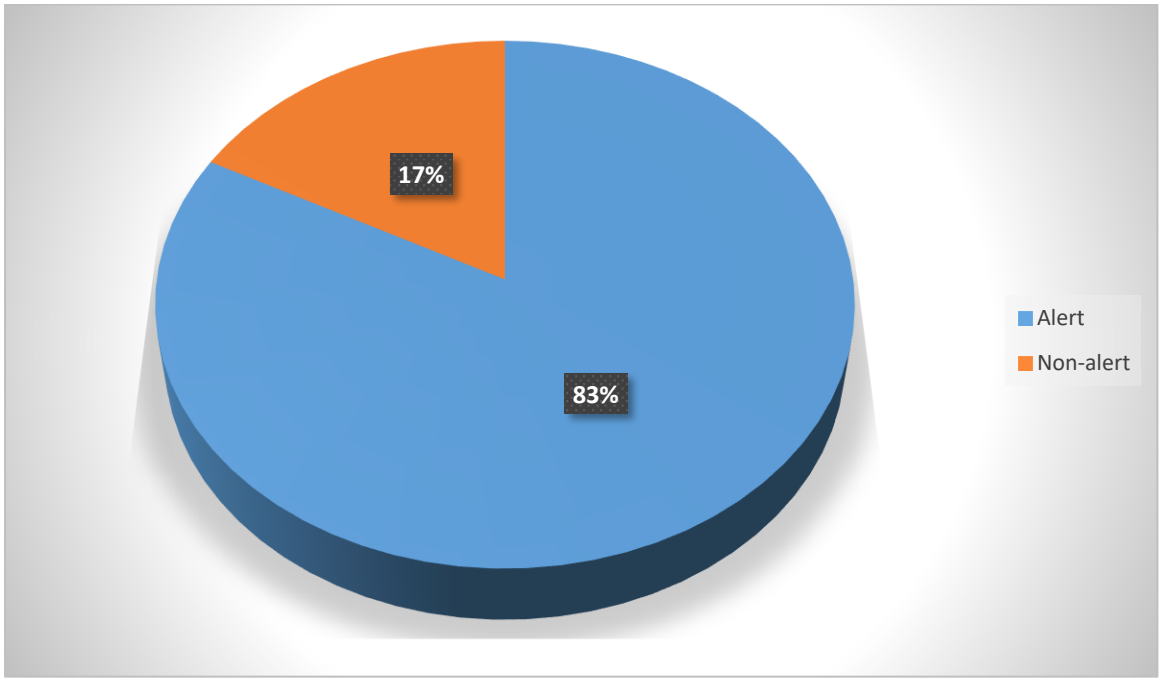


Figure 4.5: Entrepreneurship alertness of the cooperative managers
Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022

4.4. Business characteristics

Demographic information assists to determine at what extent they influence the managers' response in the study. The demographical information that is discussed in this section includes age, marital status, sex, past working experience, highest qualification and entrepreneurship alertness. Table 4.1 shows the demographic information of cooperative managers.

Table 4.2: Business characteristics of cooperatives

	Frequency	Percentage
Permanent employees		
2-4	14	48.28
5-10	14	48.28
11-25	1	3.45
Temporary employees		
0-1	21	72.41
2-4	5	17.24
5-10	3	10.34
Cooperative members/farmers		
5-10	18	62.07
11-20	7	24.14
21-30	4	13.79
Support network		
Grants	28	96.55
Networks	1	3.45
Land ownership		
Yes	10	34.48
No	19	65.52
Land acquisition method		
Rented	10	34.48
Land reform	19	65.52
Major crops grown		
White Maize	17	58.62
Yellow maize	16	55.17
Sunflower	15	51.72

Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022

4.4.1. Employee's status

The cooperatives had a higher number of permanent employees as compared to temporary employees. Table 4.2 above show that majority of the cooperatives employed 2-4 permanent employees and 5-10 employees (48.28% and 48.28% respectively). Furthermore, it shows asserts that the cooperatives hire fewer temporary employees as it is shown in the table above that 72.41% of the cooperatives employed 0-1 temporary employees, followed by 17.24% that

employed 2-4 employees and lastly 10.34% of the cooperatives employed 5-10 employees. This is in contrast to the main aim of cooperatives as outlined by DTI (2004) which maintains that cooperatives were mainly formed on the basis that they will make significant contribution towards job creation and equitable distribution of income. The results above shows that majority of these crop cooperatives found in Dr NMMD employ small numbers of people.

4.4.2. Affiliated cooperative members

Table 4.2 above illustrates that 62.07% of the cooperatives has 5-10 cooperative members that are affiliated to them. This shows that cooperatives in this district has a fewer numbers of farmers which are members of those cooperatives. This is followed by those cooperatives that have 11-20 members which contributes 24.14% and lastly 13.79% of cooperatives have 21-30 cooperative members.

4.4.3. Support network

The majority of the cooperatives receives supports from grants and this is shown in table 4.2 above which illustrates that 96.55% of cooperatives receives support of grands. Only 3.45% of these cooperatives receives support from other support networks.

4.4.4. Land ownership

The other major problem that is facing our farmers and privately owner agricultural businesses is the issue of land ownership.

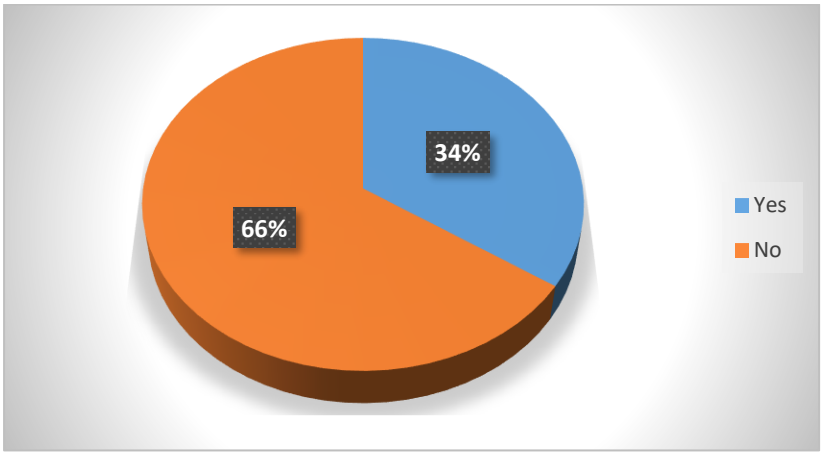


Figure 4.6: Land ownership
Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022

As it is illustrated in figure 4.4, the majority of the cooperatives (65.52%) do not have legal ownership of the land in which they operate in. Only 34.48% of the cooperatives own the land where they operate their cooperatives in. Out of that 65.52% of the cooperatives that do not own land, 34.48% rented the land from private owners of the land, whereas 65.52% acquired it under land reform. Zvirgzdina *et al*., (2009) suggests that land is the most significant factor of production and lack of land causes low productivity of farmers. Therefore, this suggest that most of the crop cooperatives in this study will not be doing well financially and productively.

4.4.5. Major crops grown

Agriculture is the major provider of many households in the study are and the main economic activity is the production of livestock and crops. The province has 215 cooperatives under the agricultural sector and the highest number of cooperatives in the province are involved in livestock and crop farming, followed by mixed farming, poultry and vegetables (27%, 23%,14%, 14% and 14% respectively) (DAFF, 2015). Below, table 4.3 shows major crops grown by the cooperatives in the study area.

Table 4.3: Major crops grown in each cooperative

Major crops grown		
White Maize	17	58.62
Yellow maize	16	55.17
Sunflower	15	51.72
TOTAL	**Out of 29**	**100%**

Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022

The above statistic represents the results of the study population, because most of the farmers in Ngaka Modiri Molema District participate in crop farming, as stated before. According to table 4.3, the results show that 58.62% of the crop cooperatives in Ngaka Modiri Molema District of the North West Province produces white maize, and 55.17% produces yellow maize, followed by 51.72% which produces sunflower. These findings are consistent with the findings of DAFF (2015), who argue that cooperatives in the North West province are mostly involved in crop farming.

4.5. Entrepreneurship skills of cooperative managers

According to Hanf and Müller (1997) suggests that a farm entrepreneur who is open-minded should be able to recognize more problems in a dynamic environment with fast technical progress than they are able to rationally solve. Hence, McElwee (2006) suggests that agricultural entrepreneurs should have the capacity to recognize problems before-hand and work around them up to a point where they could finally make a decision on how solve the problem, create and maintain personal cognitive requirements for problem-solving and decision-making, and allocate appropriate time to management and operational tasks. Illustrated below is the entrepreneurship skills of sampled cooperative manager.

Table 4.4: Entrepreneurship skills of cooperative managers

Entrepreneurship skills										
	Professional		**Management**		**Opportunity**		**Strategic**		**Networking**	
	Frequ	Perce	Frequ	Perce	Frequ	Perce	Frequ	Perce	Frequ	Perce
Not at	0	0	5	17.2	7	24.1	11	37.9	10	34.5
Slightl		10.4	13	44.8	17	58.6	17	58.6	14	48.3
Moder		37.9	5	17.2	3	10.3	1	3.4	3	10.3
Skille		34.5	6	20.7	2	6.9	0	0	2	6.9
Very		17.2	0	0	0	0	0	0	0	0
Total	**29**	**100**	**29**	**100**	**29**	**100**	**29**	**100**	**29**	**100**

Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022

Table 4.4 above illustrates the entrepreneurship skills that are possessed by cooperative managers within primary agricultural crop cooperatives of Ngaka Modiri Molema District of the North West province. The results shows three categories of entrepreneurship skills which are: management skills, opportunity skills, strategic skills and lastly networking skills. These skills are ranked with Likert-type scales whereby sampled managers will score their skills on a scale of 1 to 5, with 1 denoting not at all skilled, and 5 denoting very skilled.

According to the results, more than 50% of the cooperative manager assert that they have professional skills, whereas 44.8% believe that they possess management skills only slightly. Moreover, none of the participants (0%) believe that they are very skilled when it comes to management skills. This would include opportunity skills, strategic skills and networking skills; in contrast whereas 0% of the participants assert that they are not very skilled, 58.6% of the managers maintain that they do have opportunity and strategic skills, though these are

only slight. Furthermore, table 4.4 shows that only 48.8% of the respondents moderately possess networking skills. Moreover, 10 managers out of 29 believe that they do not have networking skills, and 11 of the managers also believe that they do not have strategic skills. According to McElwee (2006) these results show that most the managers do not have the capacity to recognize problems before they arise, because they lack skills such as opportunity skills and strategic skills which can help them to solve problems they are faced with. Therefore, farmers who are under such cooperatives may face difficult challenges because of this insufficiency. Rudmann *et al*., (2008) suggest that farmers mostly need professional skills for their success, which is one of the skills that most of cooperative managers' lacks based on the above results.

4.6. Cooperative performance

4.6.1. Level of Productivity

The approach that was adopted by the study to measure productive efficiency in these cooperatives was the stochastic frontier approach. The results are presented below.

Table 4.5: Stochastic frontier regression model results

Number of observation = 29

Wald chi2 (2) = 11.74

Prob > chi = 0.0028

CTFERT	Coef.	Std. Err	z	P>l z l	[95% Conf.	Interval]
CTHERB	.7897741	.2549977	3.10	0.002*	.2899877	1.289561
CTSEED	-.1400162	.1180896	-1.19	0.236	-.3714677	.0914352
_cons	7.028553	2.097747	3.35	0.001	2.917044	11.14006
/lnsig2v	-.4936692	.2631091	-1.88	0.061	-1.009354	.0220152
/lnsig2u	-9.203449	267.5857	-0.03	0.973	-533.6617	515.2548

LR test of sigma_u=0: chibar (01) = 0 Prob >= chibar2 = 1.000

F-statistic p-value 0.0121

VIF mean 1.01

Adjusted R-squared 0.2334

*****, **, *** significant at 1%, 5% and 10% respectively

CTFERT= Crop Ton Fertilizer, CTHERB= Crop ton Herbicides, CTSEED= Crop ton Seeds (Frontier variables)

Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022

Table 4.5 above shows the results of stochastic frontier regression model as it was outlined in the previous chapter. The analysis aimed at assessing the current level of productivity of primary agricultural crop cooperatives in Ngaka Modiri Molema District. The goodness-of-fit of the estimated model was measured using F-statistic and the results shows an F-statistic p-value of 0.0121 which indicates an acceptable measure of fit. Moreover, multicollinearity was tested and the results showed an average Variance Inflation Factor of 1.01 which is lower than 8, which shows that there is no multicollinearity in the analysis. The Breusch-pegan/Cook-Weisberg test was also performed to check heteroscedasticity. The results showed that heteroscedasticity was 0.6375, which is higher than 0.05. Therefore, this asserts that there was no heteroscedasticity.

Technical Efficiency Estimates

According to Ali & Byerlee (1991), a farmer is technically inefficient is increasing farm output without increasing the use of at least one input is impossible. Moreover, factors like improper timing or method of input application such as fertilizers, which in most cases is caused by lack of information, can cause technical inefficiency. Given the specification of the stochastic frontier model in equation (1), the results in table 4.6 of the predicted technical efficiency vary slightly among cooperatives, with the minimum value of 0.9920 and maximum value 0.9922 and a mean efficiency of 0.9920437. Table 4.6 shows the frequency distribution of technical efficiency estimates of the sampled crop cooperatives.

Table 4.6: Frequency Distribution of Technical Efficiency Estimates of the cooperatives

Fegrp	Frequency	Percent	Cum.
0.90 – 1.00	29	100.00	100.00
Total	**29**	**100.00**	

Source: Results obtained from STATA (version 15) generated from telephone survey, 2021, 2022

According to the results in table 4.6, the distribution of the technical efficiency shows that 100% of the sampled cooperative's technical efficiency skewed in the 0.90-1.00 range. This indicates that most of the cooperatives use their advanced technological resources efficiently in the production process.

4.6.2. Financial performance

The study employed Data Envelope Analysis Program (DEAP) to analyse the financial performance of primary agricultural crop cooperative in Ngaka Modiri Molema District of the

North West Province. This computer program is used to conduct Data Envelopment Analysis (DEA) using financial ratios to calculate efficiencies in production. This study used Malmquist DEA methods to calculate catalogues of Total Factor Productivity (TFP) change, technical efficiency change, and scale efficiency change. Table 4.7 below shows the results of the Malmquist method of the DEA.

Table 4.7: MALMQUIST INDEX SUMMARY

	Year 1					Year 2				
Cooperative	**effch**	**techch**	**Pech**	**sech**	**tfpch**	**effch**	**techch**	**pech**	**sech**	**tfpch**
1	0.755	0.684	0.104	7.250	0.517	0.417	1.808	0.417	1.000	0.755
2	7.706	0.334	14.500	0.531	2.574	0.257	2.336	1.000	0.257	0.601
3	2.900	0.686	2.900	1.000	1.990	0.381	1.213	0.381	1.000	0.462
4	5.750	0.150	5.750	1.000	0.860	0.174	5.913	0.174	1.000	1.028
5	0.972	0.636	0.972	1.000	0.618	1.029	0.769	1.029	1.000	0.791
6	1.000	2.425	1.000	1.000	2.425	1.000	0.723	1.000	1.000	0.723
7	1.000	0.529	1.000	1.000	0.529	2.154	0.952	4.000	0.538	2.051
8	1.014	0.632	1.014	1.000	0.641	0.998	0.677	0.998	1.000	0.676
9	1.000	0.611	1.000	1.000	0.611	1.000	0.667	1.000	1.000	0.667
10	2.900	1.003	2.900	1.000	2.907	0.435	1.950	0.435	1.000	0.848
11	1.000	0.500	1.000	1.000	0.500	1.000	0.667	1.000	1.000	0.667
12	1.481	1.082	1.000	1.481	1.602	0.477	0.917	0.477	1.000	0.437
13	0.893	0.554	0.893	1.000	0.495	1.000	0.667	1.000	1.000	0.667
14	0.905	2.549	0.560	1.616	2.307	1.786	0.467	1.786	1.000	0.833
15	1.216	0.544	1.216	1.000	0.661	0.968	0.994	0.968	1.000	0.962
16	0.963	0.566	0.963	1.000	0.545	1.058	0.680	1.058	1.000	0.719
17	1.000	0.500	1.000	1.000	0.500	1.000	0.667	1.000	1.000	0.667
18	1.068	1.484	1.068	1.000	1.585	0.944	0.552	0.944	1.000	0.521
19	1.058	0.635	1.058	1.000	0.672	0.934	0.950	0.934	1.000	0.887
20	1.157	1.315	1.157	1.000	1.521	0.932	1.092	0.932	1.000	1.018
21	1.314	0.635	1.362	0.964	0.834	0.761	1.018	0.734	1.037	0.775
22	1.053	0.608	1.053	1.000	0.640	1.198	1.403	1.198	1.000	1.680
23	1.000	0.286	1.000	1.000	0.286	1.000	2.601	1.000	1.000	2.601
24	1.060	2.355	1.060	1.000	2.497	1.000	0.723	1.000	1.000	0.723
25	1.000	2.425	1.000	1.000	2.425	1.000	0.723	1.000	1.000	0.723
26	1.000	0.611	1.000	1.000	0.611	1.077	0.943	1.077	1.000	1.016

KEY CODES:

effch– efficiency change

techch– technical efficiency change

pech–pure efficiency change

sech–scale efficiency change

tfpch–total factor productivity change

27	1.000	0.611	1.000	1.000	0.611	1.022	0.661	1.022	1.000	0.676	
28	1.000	0.611	1.000	1.000	0.611	1.000	0.667	1.000	1.000	0.667	
29	1.000	0.570	1.000	1.000	0.570	1.000	1.491	1.000	1.000	1.491	
Mean	1.256	0.725	1.165	1.078	0.911	0.832	0.994	0.890	0.935	0.827	

Source: Results obtained from DEAP version 2.1. Author constructed, 2022.

MALMQUIST INDEX SUMMARY

The above Table 4.7 indicates that for the year 2018/19, the average total factor productivity change is 8.9% which signified a decline in total productivity from the year 2017/18 due to efficiency change. The results further asserts that cooperative number 10 had the highest total factor productivity change amongst the 29 cooperatives in the study area during year 2 at 90.7%. This increase was due to an increase in the efficiency change to the extent of 90%, and pure efficiency change to an extent of 90% also, while the scale efficiency change remained constant. During the year 2018/19, 65.52% of the cooperatives experienced a decline in total factor productivity change, and the a cooperative that had the lowest total factor productivity change was cooperative number 13 which experienced a total decline of 50.5%. For the year 2019/20, the average total factor productivity change was 17.3% which was less when compared to the year 2018/19. Furthermore, this average total productivity change of 17.3% of the year 2019/20 shows that there has been a decline in the productivity of cooperatives in that year, and this decline was mainly due to technical efficiency change within cooperatives. This means that most of the cooperatives were not growing, technical efficiency of some of the cooperatives were high, which meant that they used most of their advanced technologies. Moreover, 21 out of 29 cooperatives had a decline in in the total factor productivity change during 2019/20, which is 72% of the cooperatives. In the case of cooperative number 10 which was doing great in the year 2018/19, in the year 2019/20 it faced a decline in total factor productivity change of 15.2%. This suggests that even cooperatives that were doing well in 2018/19 are now struggling financially.

MALMQUIST INDEX SUMMARY OF ANNUAL MEANS.

Table 4.8: MALMQUIST INDEX SUMMARY OF ANNUAL MEANS.

Year	effch	techch	pech	sech	tfpch	***KEY CODES:***
2	1.256	0.725	1.165	1.078	0.911	**effch**– efficiency change
3	0.832	0.994	0.890	0.935	0.827	**techch**–technical efficiency change
Mean	1.023	0.849	1.018	1.004	0.868	**pech**–pure efficiency change **sech**–scale efficiency change **tfpch**–total factor productivity change

Source: Results obtained from DEAP version 2.1. Author constructed, 2022.

Table 4.8 above shows the results of MALMQUIST INDEX SUMMARY OF ANNUAL MEANS for sampled primary agricultural crop cooperatives. For the entire study period, the average total factor productivity change experienced a decline of 13.2%. This decline was due to a decline in the technical change of cooperatives to an extent of 15.1%, although there was an increase of scale efficiency to the extent of 0.4%, and pure efficiency by the value of 1.8%. From year 2018/19 to 2019/20, the total factor productivity change declined by 0.084 units.

MALMQUIST INDEX SUMMARY OF FIRM MEANS

Table 4.9: MALMQUIST INDEX SUMMARY OF FIRM MEANS

Cooperative	effch	techch	pech	sech	tfpch	
1	0.561	1.112	0.209	2.693	0.624	
2	1.408	0.883	3.808	0.370	1.243	
3	1.051	0.913	1.051	1.000	0.959	
4	1.000	0.940	1.000	1.000	0.940	***KEY CODES:***
5	1.000	0.699	1.000	1.000	0.699	**effch**– efficiency change
6	1.000	1.324	1.000	1.000	1.324	**techch**–technical efficiency change
7	1.468	0.710	2.000	0.734	1.042	**pech**–pure efficiency change
8	1.006	0.654	1.006	1.000	0.658	**sech**–scale efficiency change
9	1.000	0.638	1.000	1.000	0.638	
10	1.123	1.398	1.123	1.000	1.570	
11	1.000	0.577	1.000	1.000	0.577	
12	0.840	0.996	0.690	1.217	0.837	
13	0.945	0.608	0.945	1.000	0.574	
14	1.271	1.091	1.000	1.271	1.386	

15	1.085	0.735	1.085	1.000	0.798	**tfpch**–total factor productivity change
16	1.009	0.620	1.009	1.000	0.626	
17	1.000	0.577	1.000	1.000	0.577	
18	1.004	0.905	1.004	1.000	0.909	
19	0.994	0.777	0.994	1.000	0.772	
20	1.038	1.198	1.038	1.000	1.244	
21	1.000	0.804	1.000	1.000	0.804	
22	1.123	0.924	1.123	1.000	1.037	
23	1.000	0.862	1.000	1.000	0.862	
24	1.030	1.305	1.030	1.000	1.344	
25	1.000	1.324	1.000	1.000	1.324	
26	1.038	0.759	1.038	1.000	0.788	
27	1.011	0.636	1.011	1.000	0.643	
28	1.000	0.638	1.000	1.000	0.638	
29	1.000	0.922	1.000	1.000	0.922	
Mean	1.023	0.849	1.018	1.004	0.868	

Source: Results obtained from DEAP version 2.1. Author constructed, 2022.

The results in table 4.9 illustrates that in the study period, cooperative number 10 was more efficient than other cooperatives, because it had the highest total factor productivity change of 57%. This was due to an increase in pure efficiency change to an extent of 1.8% and an increase in scale efficiency by 0.4%. This cooperative was followed by cooperative number with a total factor productivity change of 38.6%, and this increase was due to scale efficiency change by 27.1%, and technical change by an extent of 9.1% , although pure efficiency remained stagnant.

4.7. Canonical Analysis

This study used canonical correlation analysis to measure the relationship between two sets of variables- cooperative performance (Productivity and Financial performance) and Entrepreneurship skills (Professional skills, Management skills, Opportunity skills, Strategic skills and Networking skills). Canonical analysis is used to show how much variance of the dependant variables is explained by the dimensions. Furthermore, the study employed Wilk's lamda and corresponding *F*-test to evaluate the null hypothesis of the study, which stated that the canonical correlations for all function are zero. For this model, only one of the two of

canonical correlation coefficient is statistically significant, $p<0.05$. The other function is not statistically significant, therefore, it will not be interpreted.

The strength of the relationship between the pair of variates is reflected by the CCA coefficient (R_c). For the first function, R_c = 0.5883. For the second function, R_c = 0.4631. The canonical correlation, when squared, shows how much variance in one canonical variate with ideal weights is explained by the other canonical variate with optimal weights.

A measure of redundancy is the variance of one set of variables as anticipated from the other set of variables when they are combined linearly. Similar to the squared multiple R in multiple regression is the R_d. Remember that the squared R_c must also exactly equal 1 in order for the redundancy coefficient to be equal to 1 and the synthetic variables for the function to accurately represent all of the variance of each variable in the set. The canonical correlation's meaning may be tested using the redundancy index. For the first function R_d = 0.1741 for the *u*-variables, and R_d = 0.0791 for the *v*-variables. For the second function, R_d = 0.1066 for the *u*-variables, and R_d = 0.0584 for the *v*-variables.

Canonical loadings and standardized canonical coefficients were used to assess the relative weights of the model's variables. Figure 4.7 below shows the significant (first) function's normalized canonical coefficients. For the first variable set, *productivity* is most important, a one standard deviation increase in *productivity* leads to a 0.7581 increase in the score on the first canonical variate in the second variable set when the other variable in the model are held constant. For the second variable set, *networking skills* is most important, a one standard deviation increase in *networking skills* leads to a 0.7971 increase in the score on the second canonical variate in the first variable set when the other variable in the model are held constant. Financial performance was found to favourably contribute to the canonical connection, as shown by the data in figure 4.5. Only one variable in the first dependent variate has a loading that is equal to or greater than 0.59, indicating a high degree of correlation between the two variables and indicating that the financial performance measure is the only reliable indicator of cooperative level performance of crop cooperatives. However, the ranking of the average proportion of canonical loading shows that the only reliable indication of farm level performance is financial performance.

Except for one negative loading, the independent variates in function 1 all show positive loadings between 0.2671 and 0.7971. It is not surprising that the three variables with the highest loading are "Management skills" (0.5152) and "Networking skills" (0.7971) are the variables

that contribute most to cooperative performance since the extraction of the variates in canonical correlation is to maximize the predictive objectives. Opportunity skills, however, also account for a sizeable portion of the observed range in cooperative performance (0.2671).

Moving on to Function 2, the coefficients in Table 4.5 show a very different pattern, with "Management skills" being the factor that most significantly influences the canonical connection (0.7737). Both "Strategic skills" and "Networking skills" have negative coefficients in this function.

Figure 4.10: Standardized coefficients

Standardized coefficient for the first variable set

	1	2
Productivity	0.7581	0.6522
Financial performance	-0.6475	0.7621

Standardized coefficient for the second variable set

	1	2
Management skills	0.5152	0.7737
Opportunity skills	0.2671	0.0589
Strategic skills	-0.4153	-0.2580
Networking skills	0.7971	-0.6271

Source: Results obtained from STATA (version 15). Author constructed, 2022

Canonical loadings are illustrated in Figure 4.10 for the *u*-variables, *productivity* is most closely related to the first canonical function, and *financial performance* is most closely related to the second canonical function. For the *v*-variables, *networking skills* is most closely related to the first canonical function, and *management skills* is most closely related to the second canonical function.

Figure 4.11: Canonical loadings

Canonical loadings for variable list 1

	1	2
Productivity	0.7621	0.6475
Financial performance	-0.6522	0.7581

Canonical loadings for variable list 2

	1	2
Management skills	0.5228	0.7406
Opportunity skills	0.1011	0.3811
Strategic skills	-0.2448	-0.0415
Networking skills	0.7552	-0.6280

Source: Results obtained from STATA (version 15). Author constructed, 2022.

Heenkenda and Chandrakumara's interpretation was adopted in this study (2016). The canonical correlation demonstrates the extent to which the dimensions account for the variance of the dependent variables. The overall multivariate significance tests are displayed in Table 4.10. In Panel A and Panel B of Table 4.10, the latent successive root tests, eigenvalues, and canonical correlation coefficients obtained from the study are displayed. The canonical correlations demonstrate the extent to which the dimensions account for the variation of the dependent variables. Only the first of the two canonical dimensions shown by this model is statistically significant. The first test of dimensions, which examined the significance of each dimension individually and together, concluded that it was significant. It was significant in the second test of dimensions also, which looked at whether dimensions 1 and 2 taken together were significant. The final test of dimensions, which examined the significance of the combination of dimensions 2 and 2, did not find any significance.

Canonical correlation measures the percentage of variance explained by the predictor canonical variate in the dependent canonical variate. The result shows a very significant function ($p < .005$) and provides the proportion of total variability that is not explained. The null hypothesis that the provided canonical correlation and any smaller ones are equal to zero in the population is tested using the Wilks lambda test statistic. For the set of canonical correlations being investigated, each value can be calculated as the sum of 'cooperative performance'.

According to the results of this analysis, the canonical correlations are 0.5883 and 0.4631, therefore the value for testing both correlations are zero (1- 0. 5883)*(1-0. 4631) * = 0.51369.

Table 4.10: Multivariate tests and canonical analysis

Multivariate Tests of significance (S=2, M=O, N=29					**Panel A**
Test Name	Value	Approximate F	Hypothesis DF	Error DF	Significance of F
Pillais's	0.56053	2.3364	8	48	0.0331
Hotellings's	0.802214	2.2061	8	44	0.0453
Wilks's	0.51369	2.2726	8	46	0.0386
Roys's	0.529176	3.1751	4	24	0.0315
Eigenvalues and Canonical Correlations					**Panel B**
Root No.	*Eigenvalue*	*%*	*Cumulative %*	*Canonical correlation*	*Squared Correlation*
1	0.6980	49.3600	49.3600	0.5883	0.3461
2	0.7161	50.6400	100.000000	0.4631	0.2145
Dimension Reduction Analysis					**Panel C**
Roots	*Wilks λ*	*F*	*Hypothesis DF*	*Error DF*	*Significance of F*
1 TO 2	0.51369	2.2726	8	46	0.0386
2 TO 2	0.785523	2.1843	3	24	0.1161

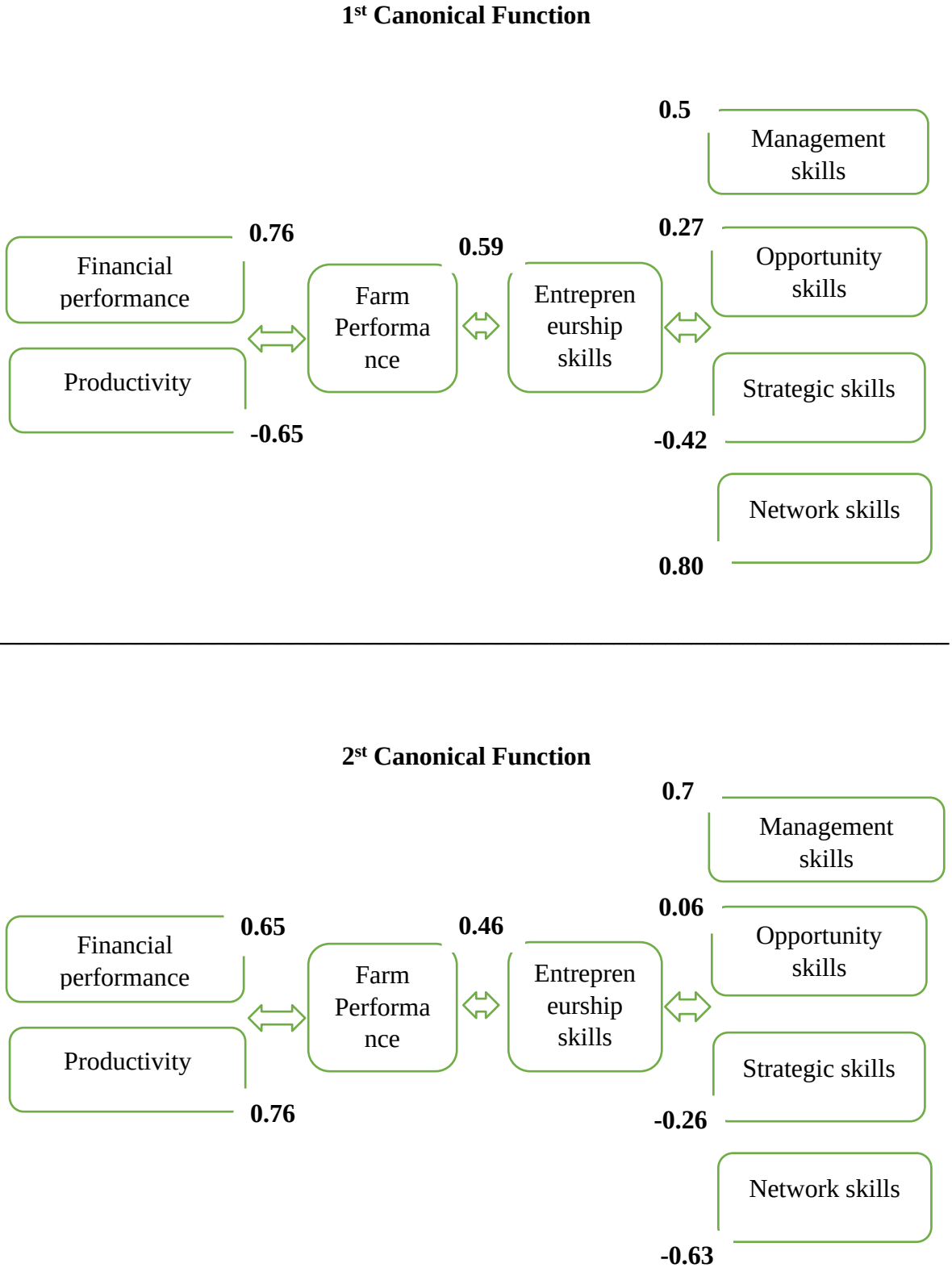
Source: Results obtained from STATA (version 15). Author constructed, 2022

The canonical correlations are shown in Figure 4.11 for a simple understanding of the findings. It demonstrates that for root 1 and root 2, respectively, the correlations between the two sets of variables are 0.5883 and 0.4631. Given that there is a significant link between "cooperative performance" and "entrepreneurship skills," these show statistically significant correlations between the two variables. When all dimensions (roots) are considered, two sets of variables exhibit a strong link; however, when the dimensions are reduced from 2 to 1, the association steadily deteriorates from 0.5883 to 0.4631.

Important economic insights can be gained by interpreting the correlations (factor loadings) between the dependent variables and the canonical variables, which reflect latent components. In terms of Root 1 of 2, the factor loadings of "Management skills, Opportunity skills, Strategic skills, Networking skills" are 0.52, 0.27, -0.42 and 0.80 respectively. The left side of the figure's factor loadings, on the other hand, shows how much of the variance in the dependent variables may be attributed to the latent, independent factors. It demonstrates that "Financial performance" and "Productivity" have factor loadings of 0.7581 and -0.6475, respectively. The factor loadings for "management skills," "opportunity skills," "strategic skills," and "networking skills" are 0.78, 0.06, -0.26 and -0.63 respectively for Root 2 of 2. However, factor

loadings for "Financial performance" and "Productivity" are 0.6522 and 0.7621, respectively, as seen in the left-hand side of the figure.

Figure 4.11: Canonical correlation



Source: Results obtained from STATA (version 15). Author constructed, 2022.

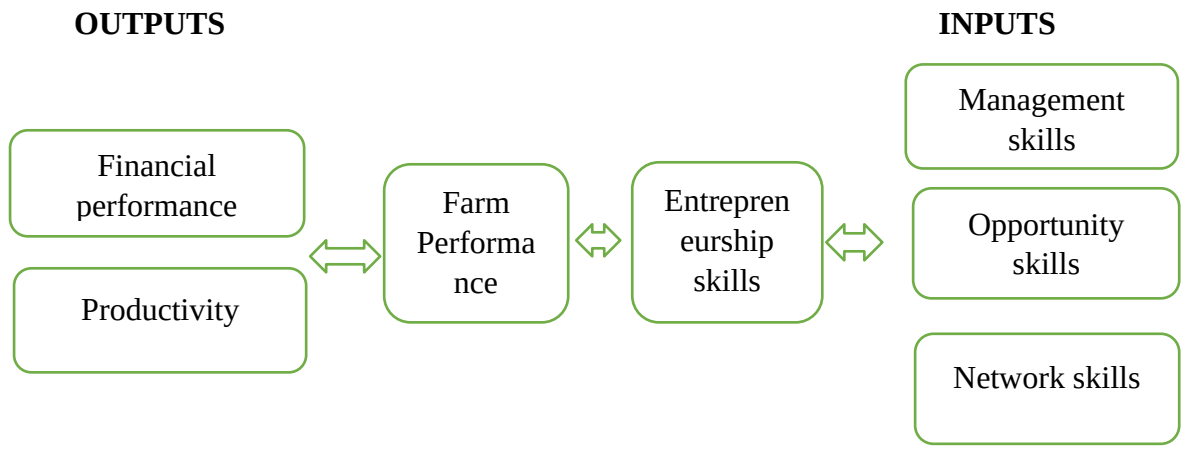
To assess the shared multivariate relationship between the two sets of variables, the canonical correlation analysis was performed utilizing two farm level performance characteristics as predictors of the four entrepreneurship skills variables. For each succeeding function, the analysis produced two functions with squared canonical correlations (Rc2) of 0.3461 and 0.2145. Using the Wilks's = 0.51369 criteria, F (8, 46) = 2.2726, p.005, the whole model for all functions was statistically significant. Wilks's denotes the variance that the model is unable to account for, and 1 denotes the whole model effect size in a r2 metric.

The hierarchical arrangement of functions was tested for statistical significance using the dimension reduction analysis that the analysis produced. At F (3, 24) = 2.1843, p>0.005, function 2 to 2 was not statistically significant.

4.8. Developed Entrepreneurship framework.

The purpose of the study was to examine whether there is a relationship that exists between the entrepreneurship skills of agricultural primary crop cooperative managers and the level of cooperative performance. The study recognised that management skills, opportunity skills and networking skills have a significant association with the cooperative performance factors (Financial performance and productivity) as shown in figure 4.12 below. It also identified that financial performance was the main contributor of performance of the crop cooperatives.

Figure 4.12: Developed Entrepreneurship framework



Source: Results obtained from STATA (version 15). Author constructed, 2022.

The relationship between the variables demonstrates that management and opportunity skills are important policy variables that can improve the cooperatives' financial performance and

productivity. The analysis in figure 4.11 above demonstrates that the relationship between management skills, opportunity skills, and cooperative financial performance is the one that is strongest among the relationships that have been identified. As a result, cooperative managers are encouraged to be capacitate with the identified skills as they were found to contribute positively to productivity and financial performance. Figure 4.12 above illustrates the entrepreneurship framework that is proposed by the study.

The study suggests that cooperative managers must be capacitated with management skills which includes, fianacial management and administration skills; human resource management skills; customer management skills and general management, for them to be entrepreneurial, thus increase the performances of their cooperatives. The other sets of skills that the study strongly recommends for managers is the opportunity skills, which involves the ability to recognise business opportunities, being market and customer orientated, and be able to recognise threats, having innovative skills and lastly, having risk management skills. Lastly, the framework suggests to increase productivity and financial performance of smallholder agricultural cooperatives (crop) in Ngaka Modiri Molema District, the cooperative managers tmust be capacitated with co-operation/networking skills. These skill includes skills related to co-operating with other farmers and companies, having netwoeking skills and team working skills, and lastly, they must be capacited with leadership skills.

4.9. Chapter summary

This chapter presented and discussed the results of the descriptive and inferential analysis of the smallholder agricultural cooperatives (crop). Descriptive analysis on this chapter made use of frequencies, percentages, tables and graphs to describe the nature and characteristics of smallholder agricultural cooperatives. Furthermore, the study employed financial ratios to assess the level of financial performance of agricultural cooperative, and interprete them using tables. The results from the Malmquist index summary of annual means, suggest that in the study period, the average total factor productivity change experienced a decline. Moreover, the study recoomended an entrepreneurship framework which encourages that agricultural cooperative managers should be capacitated with management, opportunity and networking skills to improve the productivity and financial performance of agricultural cooperatives in the study area.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter provides the summary of the study, conclusion based on the findings of the study. This chapter also provides the recommendations made by the study which are anticipated to be of future benefit to primary agricultural crop cooperatives and also their affiliated members, which aims at improving their cooperative/ farm performances by getting equipped with entrepreneurship skills which are recommended by the study. Lastly, the study implications for future research.

5.2. Summary

The dissertation's five chapters—which covered the study's background, a review of the literature, the methodology, and the presentation of the findings will all be covered in this part. This will be done to identify the link between the above mentioned and the study in general. The subsections below discuss the summaries mentioned above.

5.2.1. Background and problem statement

In south Africa, cooperatives are promoted with the aim of uplifting the .productivity aof smallholder farmers. Therefore, the main aim of this study is to improve the productivity and fianacial performance of primary cooperatives in Ngaka Modiri Molema district of the North West Province, thus supporting the main goal of the cooperatives in South Africa. When talking about agriculture and farming, terms that are mostly used are entrepreneurship, value chains and market linkages (Kahan, 2012). Farmers needs to become more entrepreneurial to increase their chances of survival and therefore, increase their produce and profits.

The entrepreneurial activity of South Africa was reported to be low,c when compared to other developing countries, and this is the reason why most farmers operate on a small scale in South Africa. These farmers are faced by challenges such as low productivity and poor access to productivity which reduces their productivity and reveneues. It is through the use of cooepratives that these farmers can be assisted to deal with such challenges. This study seeks to fill the gap that exists between the existing studies about cooperative entrepreneurship in South Africa where none of them ever recommenced the development of an entrepreneurship framework, especially in the North West province.

5.2.2. Literature review

Literature review revealed that cooperatives were seen as an economic alternate, which are viable, vibrant and strong to address the issues that were faced by the poor and vulnerable people in the world (Rena, 2017). Although, there are many definitions of cooperatives, this literature made highlights of the South African and American perspectives when it came to the concept of cooperatives.

US cooperative perspective:

This study adopted the definition given by the International Cooperative Alliance, and it defines cooperatives as an association whereby people come jointly together and is completely independent. The first cooperative to exist was establishes in 1750 and was founded among local cheese producers in the Franche- Comté region of France (Rena, 2017). They were perceived as a self-help movement, a reaction to the industrial revolution's insecurity of wage labour.

The literature reviewed highlighted different cooperative principles that are being published, which are inclusive but not limited to the Rochdale Principles, ICA Principles and the US. According to ICA principles cooperatives are open for public membership, as they allow anyone to efficiently use the resource of the cooperative where they subscribes. They asserts that these cooperatives are completely controlled by the member, and each member is subjected to the contributions decided by them, including joining fees. They are autonomous and provides training and education to its members, and there work together to increase the competition within cooperatives. The cooperatives embrace five values, according to ICA (2005). The values includes equality for all, self-reliance, self-help and self-responsibility.

SA cooperative perspective:

The literature highlighted that the first system of South African cooperatives to ever been de was during the apartheid era. These cooperatives sectors were greatly dominated by white agricultural cooperatives According to Barbara and Gerhard (2013), the growth of cooperatives impressed the South African government to the extent that they started to formulate acts and policies with the aim of supporting their cooperatives.

The study provided with historical perspective of the the cooperatives. Accordin to the literature reviewed , the activities that farmers need in order to operate in a free market economy is what describes farm entrepreneurship. It had also been reported that, farmers in

developed countries like Europe, for their survival in the ever-changing economy they are developing new skills and growing more functional capabilities, thus becoming more entrepreneurial. The literature suggests that agricultural entrepreneurs should have the capacity to recognize problems before-hand and work around them up to a point where they could finally make a decision on how solve the problem, create and maintain personal cognitive requirements for problem-solving and decision-making, and allocate appropriate time to management and operational tasks. Furthermore, the literature reviewed maintains that entrepreneurship plays a most significant role in the improvement of livelihood, job creation, and the development of an economy. It also puts more emphasis on the creation of a conducive entrepreneurship environment.

Rudmann et al. (2008) assert that the proper way to carry out responsibilities in the agribusiness is through the use of skills. These abilities are developed as a result of how the environment and the particular farmer interact. According to Vesala (2008), entrepreneurship is a well-rounded notion that encompasses both the activity and the individual. Farmers are more in need of abilities that aid in coping with the constantly changing environment because it is challenging to survive in such complexity. Therefore, encouraging entrepreneurial skills might help farmers succeed. According to McElwee, the primary challenge facing the agricultural sector is farmers' capacity to grow their entrepreneurial skills. In summary this section made discussion of what different scholars mentioned when it came to cooperatives and entrepreneurship concepts.

5.2.3. Methodology

The study employed descriptive and inferial analysis to analye the collected data from the sampled primary agricultural cooperative managers

a) Descriptive analysis

The study described and profiled the nature and characteristics of smallholder agricultural cooperatives in Ngaka Modiri Molema district. To emphasize the nature and characteristics of the cooperatives from the views of the cooperatives' management in order to analyse the data acquired from the sampled managers. The results were presented using the general frequency distribution and summary of the descriptive analysis such as frequencies and percentages is illustrated using graphs, charts and tables. The expected results of the study were that most of

the agricultural cooperatives are overwhelmed by old and uneducated people, who are mostly men. The other expectation, was that most of the cooperative does not own the lands that they operate in.

b) Inferential analysis

The study assessed the current level of productivity and financial performance of primary agricultural cooperative in the study area. The stochastic frontier technique was employed in the study to measure the level of efficiency of cooperatives. The goodness-of-fit of the estimated model was also measured using F-statistics. Moreover, multicollinearity of results was tested to check if there was collinearity in the analysis using the Variance Inflation Factor (VIF). Three three financial ratios were employed in the study to assess the financial performance of cooperatives (Liquidity, solvency and profitability). In addition, to analyse the financial performance of the cooperatives, the study used the Data Envelope Analysis. This study used Malmquist DEA methods to calculate catalogues of Total Factor Productivity (TFP) change, technical efficiency change, and scale efficiency change.

To explore the relationship that exists between entrepreneurship skills and cooperative performance, the study employed canonical analysis. Canonical analysis is used to show how much variance of the dependant variables is explained by the dimensions. Furthermore, the study employed Wilk's lamda and corresponding F-test to evaluate the null hypothesis of the study. Moreover, the finding of the study aided to formulate the entrepreneurship framework which will help to improve the performance of agricultural cooperatives and affiliated members (smallholder farmers).

5.2.4. Results

a) Descriptive interpretation of results

As it was asserted earlier, the study was conducted on managers of crop cooperatives in NNMM District. Therefore, to describe the nature and characteristics of smallholder agricultural cooperatives in the North West province, the results indicates that most these managers are mostly men (62%), than women (38%) and most of them were once married and now are widows (34%). In addition, they indicate that the highest qualification most of the cooperative managers is primary school (48%), which is the lowest level in education. Manager of the cooperatives in the study area, majority of them worked as general workers before they could be appointed as managers. This implies that most of the managers had prior experience of farming before they could be managers of cooperatives. From the sampled cooperatives,

majority of them produced white maize (58%), followed by yellow maize and sunflower at 55% and 52% rescpectively.

The study further highlighted skills which the sampled managers of the smallholder agricultural cooperatives are capacited with. The results shows that more than 50% of the managers have professional skills. The results also asserts that 58% of the managers possess opportunity and strategic skills.

b) Inferential interpretation of results

The study assessed the current level of productivity and financial performance of agricultural cooperatives in the study area. The results from this analysis shows an average total productivity change of 17.3% of the year 2019/20, which asserts that there has been a decline in the productivity of cooperatives in that year, and this decline was mainly due to technical efficiency change within cooperatives. This means that most of the cooperatives were not growing, technical efficiency of some of the cooperatives were high, which meant that they used most of their advanced technologies. Moreover, 21 out of 29 cooperatives had a decline in in the total factor productivity change during 2019/20, which is 72% of the cooperatives.

The results also explore the relationships between two sets of variables, the entrepreneurship skills and financial performance variables. It employed canonical analysis to show the variance of the dependent variables that is explained by the dimensions. Furthermore, the study employed Wilk's lamda and corresponding *F*-test to evaluate the null hypothesis of the study, which stated that the canonical correlations for all function are zero. The results of this model showed that only one of the two canonical coefficient was statistically significant at $p<0.05$. The study recognised that management skills, opportunity skills and networking skills have a significant association with the cooperative performance factors (Financial performance and productivity). It also identified that financial performance was the main contributor of performance of the crop cooperatives. Moreover, the final objective of the study pursued to develop an entrepreneurship framework which is aimed at improving the financial performance and productivity of primary crop cooperatives. The proposed entrepreneurship framework highlighted that to increase the performance of crop cooperatives in Ngaka Modiri Molema district of the North West province, cooperative manager should possess management skills, opportunity skills and lastly, Networking skills. The framework show a significant relationship among those three sets of skills and the cooperative performance variables.

5.3. Conclusion

The theoretical part of the study reviewed the literature based on agricultural cooperatives and entrepreneurship, which resulted in the formulation of a theoretical framework for the study, and ultimately the proposed entrepreneurship framework for smallholder agricultural cooperatives. The empirical part of the study involved the exploration of the relationship between entrepreneurship skills of the cooperative managers and cooperative performance, which also led to the formulation of the entrepreneurship framework to improve the performances of primary crop cooperatives. However, according to the results, the association between variables shows that management skills and opportunity skills are significant policy variables that can raise the financial performance and the productivity in agricultural crop cooperatives.

5.4. Recommendation

Based on the results of this study, recommendations can be drawn to improve the performance of primary agricultural crop cooperatives in Ngaka Modiri Molema District.

5.4.1 Study recommendations

The results obtained suggest that to improve the performance of those agricultural cooperatives, cooperative managers should be equipped with entrepreneurship skills, they should be entrepreneurially alert. The results suggests that cooperative managers need support programmes where they will be equipped with such skills. Despite the numerous debates about cooperative failures in developing countries, the study's findings confirm that entrepreneurship remains the solution to the majority of the problems faced by smallholder farmers and primary cooperatives. According to the study, cooperative membership improves the welfare of participating farmers. The findings imply that in order to improve the performance of many smallholder farmers and cooperative managers, both parties must be entrepreneurial. Furthermore, the results of this study suggests that management skills, opportunity skills and networking skills have a significant association with the cooperative performance factors (Financial performance and productivity). The association between variables shows that management skills and opportunity skills are significant policy variables that can raise the financial performance and the productivity in agricultural crop cooperatives.

5.4.2 Policy recommendations

Based on the findings of this study, it is recommended that similar studies be conducted to educate farmers and cooperative managers on the importance of being entrepreneurial in the

agricultural sector. This will not only educate them, but it will help them turn their farms into businesses. The developed framework of this study can be used by policy makers to develop models that will enhance the skills of farmers and cooperative managers, thus improve their productivity and financial performance of their operations.

5.5. Implications for future research

- ✓ The development of an entrepreneurship framework to improve the performance of smallholder agricultural cooperatives was only done in Ngaka Molema District. Therefore, it is suggested that such studies which may be more or less similar to this may be conducted in North West province as a whole.
- ✓ The main focus of this study was on primary agricultural crop cooperatives. Therefore, it is suggested that further studies be done on all cooperatives in the North West province, in order to improve their performances.

5.6. Limitations of the study

5.6.1. Limited geographical scope of the study

The primary focus of the study was only on managers of agricultural crop cooperatives within the district on Ngaka Modiri Molema of the North West Province. This serves as a limitation because the findings of this study cannot be taken as a general representation of the cooperative managers of all the cooperatives within the province or South Africa as a whole.

5.6.2. Limited sample size of cooperative managers

The study only looked at 29 cooperative managers and made recommendations based on the data they provided. Due to the recent outbreak of Covid-19 in South Africa, tracking and administering questionnaires on other managers proved difficult. Because of their sensitivity to the outbreak, most of the managers had to be reached telephonically. It is assumed that administering questionnaires to a larger group would have resulted in different study results.

5.6.3. Limited time to conduct data collection.

The other limitation of the study was lack of time. This is a limitation in a sense that not all districts could be reached within the maximum duration of the study. Ngaka Modiri Molema district is broad and scattered, therefore it was not possible to cover some parts of the district. Although, it is clear that if all the parts of the district were covered a different insight to the study would have prevailed.

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APPENDIX A: QUESTIONNAIRE

Developing Entrepreneurship Framework for Improved Productivity and Financial Performance of Primary Agricultural Cooperatives in North West Province

TEBOGO PERCY MANGOEJANE
Ethics number: NWU-01674-20-A9
Supervised by DR M. CHRISTIAN

PLEASE NOTE

All information will be treated as STRICTLY CONFIDENTIAL and will only be used for academic purposes.

INSTRUCTIONS

1. Use a pen of any colour to complete the questionnaire

2. Please mark with an X in the block(s) provided after each question which will your answer the most accurately.

3. Please make sure that all the questions are answered in order to provide comprehensive information that would enable the researcher to make an accurate analysis and interpretation of the data.

IDENTIFICATION

Municipality: .....

Questionnaire code no.: .....

1

Part A: Demographic information

1. What is your age?

   Years……

2. What sex are you?

Male	Female

3. What is your marital status?

Single	Married	Divorced	Widowed

4. Indicate your past experience immediately before your current position?

Unemployed	Self-employed (owned a business)	Worker (administration, clerk, secretary, cashier)	Farm worker
Supervisor (first-line management)	Middle management	Top (executive) management	Other (please specify)

5. How long have you held your current position?

1-2 years	3-6 years	7-10 years	10+ years

6. Indicate your highest academic qualification

No qualification	Primary schooling completed	High school completed	Post Grade 12 certificate
Post Grade12 diploma	University degree	University Post Grade degree	Other (Please specify)

7. How can you rate your entrepreneurial alertness?

Alert	Non Alert

Part B: Business characteristics

8. How many permanent employees are employed by your business?

0-1	2-4	5-10	11-25	26-50	Other(Please specify)

9. How many temporary employees are employed by your business?

0-1	2-4	5-10	11-25	Other(Please specify)

10. How many members (smallholder crop farmers) does the cooperative have?

5 – 10	11 – 20	21 – 30	31 – 40	41 – 50	Other (Please specify)

11. What are your support networks?

Grants	Networks	Professional services	Family/Friends	Other (Please specify)

12. Do you own land as a cooperative?

Yes	No

13. If yes, what is the acquisition method of that land?

Private ownership
Rented
Land reform
Other (please specify)

14. For privately owned land holding, what is the current market value of the land?

R ……..

15. Distance to the market in (km)

……

16. Indicate the age of the business

Years …….

17. What are the major crops produced in the cooperative in 2019/20 crop year?

Crops grown		**Y/N**
Maize	White maize	
	Yellow maize	
Maize		
Sunflower		
Potato		
Onion		
Wheat		
Cabbage		
Spinach		
Beans		
Butternut		
Pumpkin		
Carrot		
Tomato		
Other (please specify)		

Part C: Entrepreneurship skills

18. On a scale of 1 to 5, where 1 = not at all skilled, 2 = slightly skilled, 3 = moderately skilled, 4 = skilled, 5 = very skilled, please indicate in what way you agree with the following statements which pertain to **entrepreneurship skills** possessed by you as a primary cooperate manager:

Category	Measurement skills	1	2	3	4	5	
1. Professional skills	✓ Plant production skills ✓ Technical skills						
2. Management skills	✓ Financial management and administration skills ✓ Human Resource Management skills ✓ Customer management skills ✓ General planning skills						**Measure code** 1. not at all skilled 2. slightly skilled 3.moderately skilled 4. skilled 5. very skilled
3. Opportunity skills	✓ Recognizing business opportunities ✓ Market and customer orientation ✓ Awareness of threats ✓ Innovation skills ✓ Risk management skills						
4. Strategic skills	✓ Skills to receive and make use of feedback ✓ Reflection skills ✓ Monitoring ad evaluation skills ✓ Conceptual skills ✓ Strategic planning skills ✓ Strategic decision making skills ✓ Goal setting skills						
5. Co-operation/ networking skills	✓ Skills related to co-operating with other farmers and companies ✓ Networking skills ✓ Team working skills ✓ Leadership skills						

Part D: Cooperative performance

19. What inputs do you supply your members with, and how much did you spend on each?

	2017/18		*2018/19*		*2019/20*	
Type of input	**Quantity (kg/ha)**	**Cost/ unit**	**Quantity (kg/ha)**	**Cost/ unit**	**Quantity (kg/ha)**	**Cost/ unit**
Fertilizer						
Herbicides						
Pesticides						
Tractor						
Labour						
Seeds						
Other (Specify)						

20. How many tons of crops did you harvest in three consecutive crop years from 2017/18 to 2019/20?

Crops grown		**Quantity (tons)**		
		2017/18	*2018/19*	*2019/20*
Maize	White maize			
	Yellow maize			
Sunflower				
Potatoes				
Wheat				
Cabbage				
Spinach				
Beans				
Carrot				
Tomato				

Other (please specify)			

21. What is the gross income of the cooperative for three consecutive crop years (2017/18, 2018/19 & 2019/20)?

Crop year	**Amount (R)**					
	≤R50 000	***R51 000 – R150 000***	***R151 000 – R500 000***	***R500 001- R1 000 000***	***R1 000 001 – R 2 500 000***	***≥ R2 500 001***
2017/18						
2018/19						
2019/20						

22. Indicate the annual turnover (annual sales) that your cooperative generated over the three consecutive crop years (2017/18, 2018/19 & 2019/20)?

Crop year	**Amount (R)**					
	≤R50 000	***R51 000 – R150 000***	***R151 000 – R500 000***	***R500 001- R1 000 000***	***R1 000 001 – R 2 500 000***	***≥ R2 500 001***
2017/18						
2018/19						
2019/20						

23. Other than land, what other fixed assets are available for members?

Fixed asset	**No. available**	**Market value (R)**
Tractor		
Equipment and machinery		
Vehicles		
Buildings		
Other(Please specify)		

24. Indicate the value of the cooperatives' total assets?

Crop year	Amount (R)					
	≤R150 000	*R151 000 – R250 000*	*R251 000 – R500 000*	*R501 000- R1 000 000*	*R1 100 00 – R 2 500 000*	*≥ R2 510 000*
2017/18						
2018/19						
2019/20						

25. Indicate the value of the cooperatives' current Assets?

Crop year	Amount (R)					
	≤R150 000	*R151 000 – R250 000*	*R251 000 – R500 000*	*R501 000- R1 000 000*	*R1 100 00 – R 2 500 000*	*R2 510 000 – R5 000 000*
2017/18						
2018/19						
2019/20						

26. Indicate the value of the cooperatives' current liability?

Crop year	Amount (R)			
	≤R150 000	*R151 000 – R250 000*	*R251 000 – R500 000*	*R501 000- R1 000 000*
2017/18				
2018/19				
2019/20				

27. Indicate the value of the cooperatives' total liability?

Crop year	Amount (R)					
	≤R150 000	*R151 000 – R250 000*	*R251 000 – R500 000*	*R501 000- R1 000 000*	*R1 100 00 – R 2 500 000*	*R2 510 000 – R5 000 000*
2017/18						
2018/19						
2019/20						

APPENDIX B: INFORMED CONSENT

Developing Entrepreneurship Framework for Improved Productivity and Financial Performance of Primary Agricultural Cooperatives in North West Province

Student Name: Tebogo Percy Mangoejane

Cell: 0673129922

Email: mangoejane40@gmail.com

Degree: MSc in Agricultural Economics

Institution: University of North West (Mafikeng campus)

Supervisor: Dr M. Christian

CONSENT TO TAKE PART IN RESEARCH

I hereby confirm that:

- ➢ I voluntarily agree to participate in this study. ☐
- ➢ I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind. ☐
- ➢ I have had the purpose and nature of the study explained to me and I have had the opportunity to ask questions about the study. ☐
- ➢ I understand that participation involves being asked questions verbally with a semi-structured questionnaire and that the data will be used as part of research. ☐
- ➢ I understand that I will not benefit directly from participating in this research. ☐
- ➢ I understand that the information provided will be treated confidentially. ☐
- ➢ I understand that in any report on the results of this research my identity will remain anonymous. ☐
- ➢ I understand that under freedom of information legalisation I am entitled to access the information I have provided at any time while it is in storage. ☐
- ➢ I understand that I am free to contact the researcher to seek further clarification and information. ☐

Signature of the participant: _____ Date: _____

Signature of the researcher: _____ Date: _____

APPENDIX C: LETTER TO THE DEPARTMENT OF AGRICULTURE

ASSISTANCE FOR RESEARCH BASED ON PRIMARY AGRICULTURAL CROP COOPERATIVES

Dear Sir/Madam

My name is Tebogo Percy Mangoejane, a Master student in the Department of Agricultural Economics and Extension, North West University, Mafikeng campus, South Africa. I am currently doing my research on Smallholder Agricultural Cooperatives of Ngaka Modiri Molema District (NMMD). The title: Developing an entrepreneurship framework which aims at improving productivity and financial performance of primary agricultural cooperatives (crops) in the North West province, supervised by Dr M. Christian.

I am humbly requesting assistance from the Department with regards to the population size or population data of Primary Agricultural Cooperative (only crop cooperatives) found in Ngaka Modiri Molema District. The information will not be used for any other purpose other than the study purpose and will be kept totally confidential.

I am looking forward to hear from you, for more information required may you please contact me on 067 312 9922 or E-mail: mangoejane40@gmail.com

Thank you

APPENDIX D: ETHICAL CLEARANCE

Private Bag X1290, Potchefstroom
South Africa 2520
Tel: 018 299-1111/2222
Fax: 018 299-4910
Web: http://www.nwu.ac.za
Senate Committee for Research Ethics
Tel: 018 299-4849
Email: nkosinathi.machine@nwu.ac.za

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the **Faculty of Natural and Agricultural Sciences Ethics Committee (FNAS-REC)**, the Faculty of Natural and Agricultural Sciences Ethics Committee hereby **approves** your study as indicated below. This implies that the North-West University Senate Committee for Research Ethics (NWU-SCRE) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Developing Entrepreneurship Framework for Improved Productivity and Financial Performance of Primary Agricultural Cooperatives in North West Province
Study Leader/Supervisor: Dr M Christian
Student: TP Mangoejane

Ethics number: N W U | - | 0 1 | 6 | 7 4 - | 2 | 0 - | A | 9
Institution Study Number Year Status

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application type: Single **Risk Category:** **Minimal**

Commencement date: 01/02/2020
Expiry date: 31/12/2022

Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.

Special in process conditions of the research for approval (if applicable):

- The following documentation are archived by FNASREC and should be complete and kept up to date:
  - Research proposal
  - Signed approval from the scientific committee indicating the proposed risk category
- All researchers involved in the study should submit signed NWU code of conduct statements annually.
- All researchers of low risk studies should submit proof of relevant ethics training every two years.
- All researchers that take part in activities that pose a safety and security threat to the researchers or the environment should submit a risk assessment form annually.
- All research involving human interaction should follow best ethical practise and keep documents as proof. This includes informed consent, questionnaires, incorporation of risk-benefit, and responsible data management.
- Any research at governmental or private institutions, permission must still be obtained from relevant authorities and provided to the FNASREC. Ethics approval is required BEFORE approval can be obtained from these authorities.

File reference: 9.1.5.4.2 Page 1 of 2

General conditions:
While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:

- *The study leader/supervisor (principle investigator)/researcher must report in the prescribed format to the FNASREC:*
  - *annually (or as otherwise requested) on the monitoring of the study, whereby a letter of continuation will be provided, and upon completion of the study; and*
  - *without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.*
- *The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the study leader/researcher must apply for approval of these amendments at the FNASREC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.*
- *Annually a number of studies may be randomly selected for an external audit.*
- *The date of approval indicates the first date that the study may be started.*
- *In the interest of ethical responsibility, the NWU-SCRE and FNASREC reserves the right to:*
  - *request access to any information or data at any time during the course or after completion of the study;*
  - *to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;*
  - *withdraw or postpone approval if:*
    - *any unethical principles or practices of the study are revealed or suspected;*
    - *it becomes apparent that any relevant information was withheld from the FNASREC or that information has been false or misrepresented;*
    - *submission of the annual (or otherwise stipulated) monitoring report, the required amendments, or reporting of adverse events or incidents was not done in a timely manner and accurately; and / or*
    - *new institutional rules, national legislation or international conventions deem it.*
- *FNAS-REC can be contacted for further information or any report templates via Roelof.Burger@nwu.ac.za 018 299 4269*

The FNASREC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the FNASREC or the NWU-SCRE for any further enquiries or requests for assistance.

Yours sincerely,

Prof Roelof Burger
Chairperson Faculty of Natural and Agricultural Sciences Ethics Committee (FNASREC)

APPENDIX E: LANGUAGE EDITING

CERTIFICATE OF EDITING:

Dissertation submitted in fulfilment of the requirements for the degree *Master of Science in Agricultural Economics* at the North West University

Date: 24 November 2022

CANDIDATE:**Tebogo Percy Mnagoejane**

Student number: 25401009

TOPIC: **Developing Entrepreneurship Framework for Improved Productivity and Financial Performance of Primary Agricultural Cooperatives in North West Province**

http://orcid.org/0000-0001-8690-6580

Supervisor: Dr M. Christian

I have edited Tebogo Mnagoejane dissertation and would certify that all aspects of the linguistic expression (grammar, style, paragraphing, spelling, and vocabulary) are now of a standard that is to be expected from a document at this level and of this nature.

I am satisfied with all the language aspects of the dissertation as it now stands.

Professor Damian Garside

MA (Manchester) Ph D (Cape Town)

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