Competitiveness Analysis of the South African Avocado Value Chain

By

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DECLARATION 2 – PUBLICATIONS

Manuscript 1 – Chapter 3

Zwane S & Ferrer S.R.D. Value Chain mapping of the South African Avocado Industry. *Agricultural Systems.* (Targeted)

Manuscript 2 – Chapter 5 & Chapter 8

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ABSTRACT

The economic sustainability of the South African avocado industry is highly dependent on its trading performance, with approximately 50-55% of its total production consistently being exported since the 1990s. About 95% of the avocados in South Africa are exported to the EU, the UK, and Russia markets. The South African avocado industry faces potential intense competition from Peru, Mexico Spain, Israel, and Kenya, in these markets. Due to the significant contributions in terms of economic returns the supplying of avocados to the export markets has on this industry and the GDP of the country, and also considering the higher levels of competition this industry has been experiencing from its global rivals, there is a greater need to transport this commodity with fewer rejections, and less inefficiencies and damages to the fruit quality.

In 2018, the South African avocado export industry was ranked number nine worldwide, contributing to 1,7% of the total avocado exports in the global markets. By 2020, the industry experienced a major decline which resulted in it falling to number 12. It has been noted that South African exports are increasing, but its share of the world market is decreasing. This is because exports from other countries, primarily South and Central America, including Peru, Colombia, and Mexico, have grown at a greater rate. For example, between 2012 and 2017, South African avocado export volumes grew only by 3% per annum while major competitors such as Mexico and Peru grew by 8% and 15%, respectively. Many factors could be contributing to this phenomenon, and one of the most significant factors could be the competitiveness of the South African avocado value chain.

A review of the literature identified a significant gap in the local research when it comes to the understanding of the structure, actors, processes and the flow of avocados in the South African avocado value chain, the competitiveness of the South African avocado value chain, and the factors which are influencing the competitiveness of the South African avocado value chain. Moreover, it also identified that competitive analyses of value chains can provide information and strategies for agribusiness managers to improve value chain competitiveness. This study will try to close this gap by providing a detailed competitiveness analysis of the South African avocado value chain in order to have a better understanding of the state of competitiveness of this value chain.

The general objective of this study was to conduct a detailed competitiveness analysis of the South African avocado value chain in order to recommend strategic actions that the value chain participants could use to improve the competitiveness of this value chain, especially in relation to export markets. More specifically, the objectives are to identify the key players involved in the value chain, identify factors which are negatively affecting the competitiveness of this chain, and analyse this information to provide an improved understanding of the business trends, challenges, and transport and logistic processes of this industry.

To achieve the main objective of this study, a ***7-steps-6-analyses*** analytical framework was designed and used to provide a much-detailed competitiveness analysis of the South African avocado value chain. Analyses one and two served as an inquiry part of this study were knowledge regarding the structure of the South African avocado value chain, the number and the type of actors in this value chain, flow of avocados, processes within this value chain, relationships between actors in this value chain and how these relationships are developed and maintained, and the factors which are responsible for the inefficiencies within this value chain were identified by these analyses. Analysis two also had a quantitative part, were some of the relationships that actors have within and outside this value chain were quantified using the concept of Social Network Analysis in order to determine how these relationships influence the functioning as well as the competitiveness of some of the actors in the South African avocado value chain. Analyses three, four, five and six were analyses that analysed different components/parts of the South African avocado value chain in order to understand the competitiveness state of the overall value chain and recommend strategies to improve it. The final step (seventh step) involved a critical analysis of all the findings from the six analyses in order to provide the state of competitiveness for the South African avocado value chain. Moreover, during this step that is where the strategic actions to alleviate the constraints/factors negatively affecting the competitiveness of this value chain were developed.

The overall findings of this study suggested that the South African avocado value chain is struggling to keep up with competition from its global competitors, mainly Peru, Mexico and Kenya. Moreover, this study was able to conclude that the cause of this was the overall continuous decline in the competitive advantage which is being experienced by this value chain. The overall finding also suggested that this decline in competitiveness is as a result of a number of factors. These factors include supply of nursery trees, relatively lower yields than other competing origins around the world, higher transportation costs, port inefficiencies, low

supply of skilled labour, one major export destination, lack of value chain collaborations, higher input costs, increased plantation of avocados by global rivals, and government policies.

This study gave rise to 13 strategic actions that could be used by the most important players in the South African avocado value chain, such as agribusiness managers, producers, exporters, seaports and SAAGA in order to improve the competitiveness of this value chain. Some of those strategies include collaborations between different types of value chain actors, understanding of the value chain relationships and systems, attracting and training of new skilled workforce, development of late varieties, economic research, and access to new markets.

Keywords: Avocado, Competitiveness, Export markets, Global rivals, Strategic action, Value chain

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LIST OF ACRONYMS/ABBREVIATIONS

ANA	Avocado Nurserymen's Association
BFAP	Bureau for Food and Agricultural Policy
BRC	British Retail Consortium
CCA	Commodity Chain Analysis
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forests and Fisheries
EU	European Unions
FAO	Food and Agriculture Organization
FPEF	Fresh Produce Exporter's Forum
GAP	Good Agricultural Practices
GCI	Global Competitiveness Index
GVC	Global value chain
ITC	International Trade Commission
LPI	Logistics Performance Index
M4P	Making Market Work Better for the Poor
MRL	Maximum Residue Limits
NAMC	National Agricultural Marketing Council
NFPM	National Fresh Produce Markets
PE	Port Elizabeth/Gqeberha
PPECB	Perishable Products Export Control Board
PwC	PricewaterhouseCoopers
RCA	Revealed Comparative Advantage
RCA1	Net Trade Performance Index
RMA	Relative Import Advantage Index
RTA	Relative Trade Advantage Index
RXA	Relative Export Advantage Index
SAAGA	South Africa Avocado Growers' Association
SIZA	Sustainability Initiative of South Africa
SNA	Social network analysis
SSA	Sub-Sector Analysis
SWOT	Strengths, Weaknesses, Opportunities and Threats

UK	United Kingdom
USA	United States of America
USITC	United Stated International Trade Commission
VCA	Value chain analysis
WEF	World Economic Forum
WFR	Waterford Farm Relation

CHAPTER 1: INTRODUCTION

1.1 Background

Food production and distribution in South Africa is undergoing major structural changes caused by changing and different consumer preferences, new technologies, changing firm sizes, and more exposure to global markets (Ortmann, 2000b). According to Ortmann (2000a), consumers nowadays have become more demanding with regard to product and service quality, variety and food safety. This has resulted in agricultural and agribusiness managers to experience increased pressure to improve product and service quality, enhance productivity, and reduce production and transaction costs (Ortmann, 2000a). The agricultural sector plays an essential role in growing a nation's economy by contributing significantly from agricultural exports (earning foreign exchange), employment creation, and expanding the production base of a country (Sachitra, 2016).

Avocados grow well in subtropical regions making Limpopo and Mpumalanga provinces major production regions in South Africa. Limpopo province is the largest avocado producer, accounting for about 60% of the South Africa's total avocado production, followed by Mpumalanga province with about 30% of avocado production, and the KwaZulu-Natal province accounts for about 9%. The remaining 1% is accounted for by the Eastern Cape and Western Cape province (Sikuka, 2019). Production from the Eastern and Western Cape is mainly targeted at supplying the domestic market during the off-season period of October to March (Sikuka, 2019). During the off-season period some of the fruits are imported from Spain and Israel to meet the local demand (Currie, 2021).

The South African avocado harvesting season spreads from February to November, with most fruits being harvested from March to September (Freshplaza, 2021). The South African avocado sector contributes to at least 11 500 permanent jobs on farms and packhouses (Freshplaza, 2021). This industry is also responsible for job creation in the rural areas, especially in the top-producing areas with an estimated 23 000 casual labourers during the peak periods and 36 000 individual household members depend on this industry on an annual basis (DAFF, 2017).

Avocado (*Persea Americana*) is one of the top exported fruits in South Africa by value. The South African avocado industry is export-oriented, with its biggest markets being the European Union (EU), the United Kingdom (UK) and Russia (Department of Agriculture, Forests and

Fisheries (DAFF), 2017). There has been an increased in demand for the South African avocados, both locally and internationally (Farmers Weekly, 2016). Global avocado demand is growing very fast, and in the last five years, it has increased by 18% (Freshplaza, 2019b). The United States and the EU were the main driving forces behind the growth in world avocado trade per-2019, and this was expected to continue in the short-to-medium term (Imbert, 2019).

According to New Zealand Avocado (2019), the world avocado markets has experienced exponential growth over the past ten years, with Mexico being the leading world avocado producer and exporter. According to Freshplaza (2019a), in 2019, Mexico, the Netherlands, and Peru were the world's top avocado exporting countries by value, followed by Spain, Chile, the United States, Kenya, South Africa, New Zealand, and Colombia. In that same season, 2 140 000 tons of avocados were exported to global markets with Mexico exporting 1 198 000 tons, Peru (359 989 tons), South Africa (90 000 tons), Israel (78 000 tons) and Spain (64 000 tons) (New Zealand Avocado, 2019).

The Mexican avocado industry has three major advantages which contributes to it being the top exporter of avocados to global markets and those advantages are, a) its ability to produce avocados in all seasons, b) its focus on the higher quality Hass variety, and c) its proximity to the United States of America, which gives the country a unique competitive advantage (Food and Agriculture Organization (FAO), 2018). Another reasons that the Mexican avocado industry is leading globally in terms of production and exporting is because of the pedoclimatic conditions which allows for almost all year production, constant developments of the industry by the players, governmental support, and the availability of land size suitable for avocado production (Fruitrop Magazine, 2019).

There are three primary botanical races of avocado: the Mexican, Guatemalan, and West India (Bard, 2020). According to Faber (2016), each race exhibits a characteristic suite of traits that include differences in leaf biochemistry, peel texture and colour, and source of tolerance (diseases and salinity). These races give rise to many different cultivars of this fruit, with the most found around the world being Fuerte and Hass (Freshplaza, 2019a). Hass is considered a Guatemalan X Mexican hybrid with dominant Mexican race characteristics (Faber, 2016). Fuerte is a natural Mexican X Guatemalan hybrid with more dominant Guatemalan race characteristics (South African Avocado Growers' Association (SAAGA), 1984).

South African nurseries produce 80% of dark-skinned and Hass-type avocado (cultivars such as Carmen, Gem, Lamb-Hass and Maluma). Green-skinned avocados like Fuerte, Pinkerton,

Reed, and Ryan account for the remaining 20% of the nursery tree production (SAAGA, 2020). More dark-skinned avocados are produced because they have characteristics that enables them to better withstand the export cold chain activities. In 2019, Hass accounted for 62% and greenskins 38% of South Africa's avocado exports (World's Top Exports, 2020).

According to Babu & Shishodia (2017a), policymakers in Africa are faced with three major challenges when it comes to agriculture: achieving food security, increasing competitiveness, and boosting the productivity of the agricultural sector. Economists and policymakers worldwide are concerned about the competitiveness of the global agribusiness sector and the need for competitive advantage intervention in the agribusiness sector of developing countries (Shachitra, 2016). Success relative to competitors in the trade of agricultural products in the international markets can enable farmers to increase their income and improve their livelihoods (Babu & Shishodia, 2017b).

According to the Department of Agriculture, Forestry and Fisheries (DAFF) (2017), the South African avocado value chain's main actors are producers, processors, National Fresh Produce Markets (NFPMs), exporters, retailers, hawkers, and wholesalers as shown in figure 1.1. Avocados are sold to 1) NFPM, 2) informal markets (street hawkers and vendors), and directly to 3) retailers and 4) processors for manufacturing of guacamole and oil extraction (DAFF, 2018). In 2018, 54% of avocados produced in South Africa were sold on export markets, 14% was sold through the National Fresh Produce Markets (NFPMs), 12% was sold to the informal markets which are made up of bakkie markets and hawkers, 10% was processed and the remaining 9% was delivered directly to retailers (DAFF, 2019). Many street hawkers and vendors sell avocados that have been bought on the NFPMs. Second and third-grade avocados are also sold from packhouses and farms to the bakkie markets (traders with small bakkies and small trucks that supply fruits into the informal sector in the cities and rural areas) (Donkin, 2020).

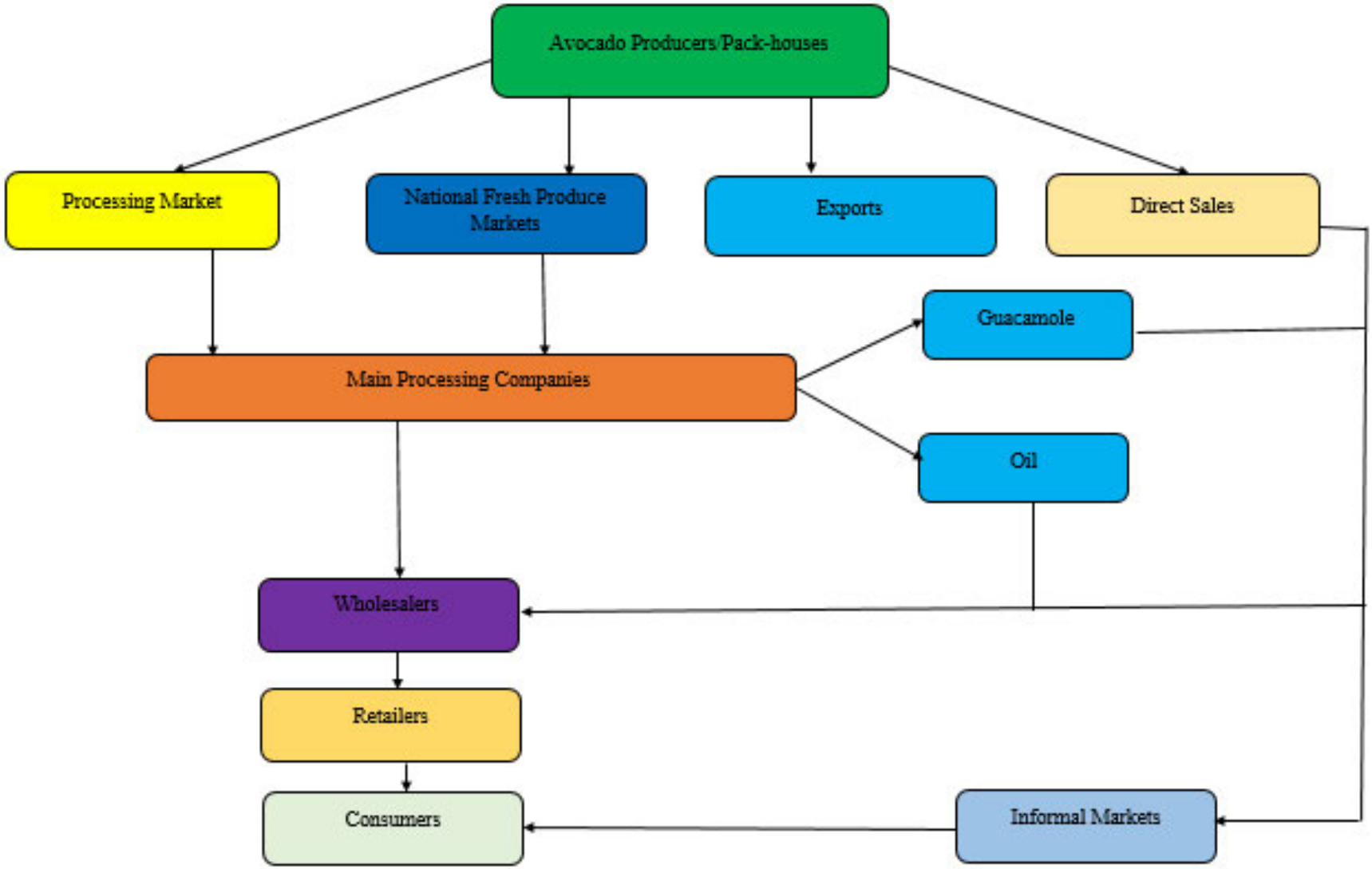

Figure 1.1: The avocado value chain in South Africa

Source: DAFF (2017)

1.2 Research Problem

The economic sustainability of the South African avocado industry is highly dependent on its trading performance, with approximately 50 – 55% percent of its total production consistently being exported since the 1990s. In 2018, the South African avocado export industry was ranked number nine worldwide, with a contribution of 1,7% of the world avocado exports (DAF,2019). By 2020 the industry had declined to number 12 (World's Top Exports, 2020). Although South African avocado exports are increasing, its share of the world market is decreasing. Exports from other countries, primarily South and Central America, including Peru, Colombia, and Mexico, are growing at a greater rate (Donkin, 2020). For example, between the years 2012 to 2017, South African avocado export volumes grew only by 3% per annum while major competitors such as Mexico and Peru grew by 8% and 15%, respectively as shown in figure 1.2 (ITC Trade maps, 2018; Chisoro-Dube *et al.*, 2019).

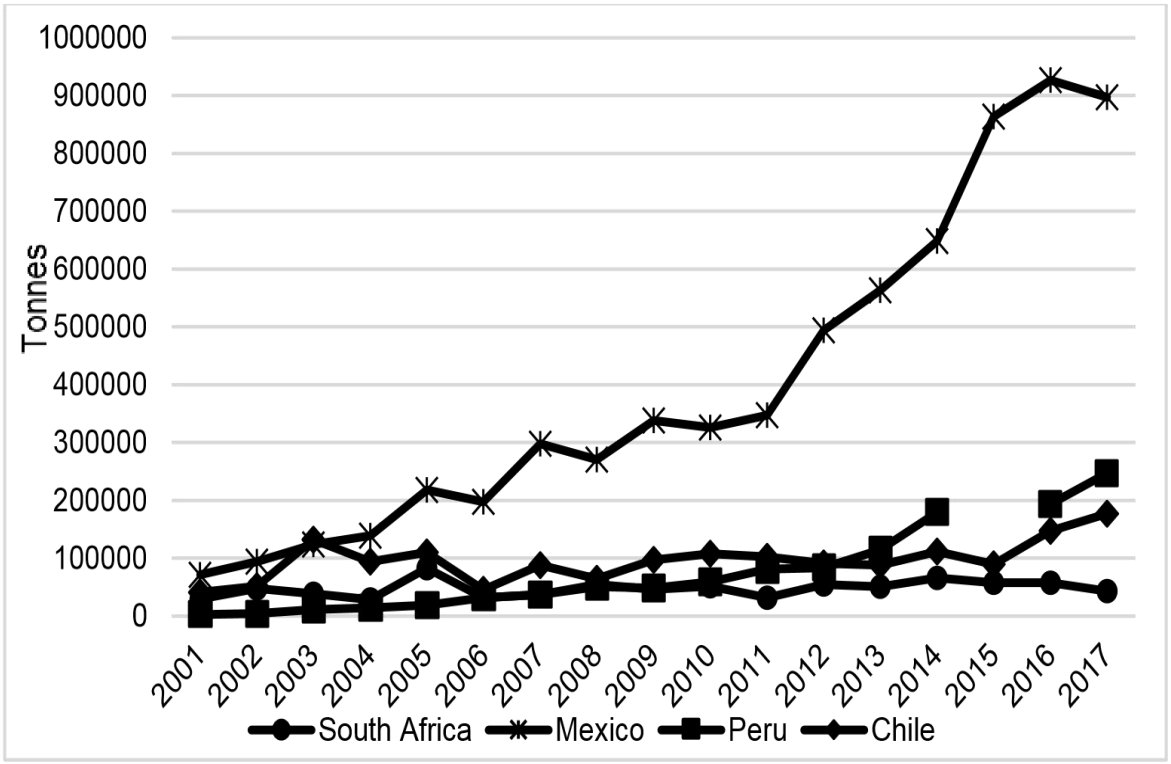

Figure 1.2: South African avocado export quantities compared with major rivals for the period of 2001 to 2017

Source: Chisoro-Dube *et al.* (2019)

Peru and South Africa both harvest and export avocados to northern hemisphere markets at the same time of year. Consequently, Peru is considered to be South Africa's most important competitor (Louw, 2020). In 2020, the supply of avocados from Peru and South Africa clashed on the market between weeks 17 to 22/23 Freshplaza (2020a). For example, during this period,

the quantity of avocados supplied to EU and UK markets by Peru was tenfold more than the quantity supplied by South Africa. Moreover, during this period, the industry and most of the industry players were not prepared for such a scenario which resulted in many financial losses for a number of avocado producers and exporters (Currie, 2021). According to Donkin (2020) cited by Freshplaza (2020b), further increased volumes of avocados supplied by the Peruvian avocado industry are expected to take place in the upcoming years in the European markets. This is because over the years the Peruvian avocado industry has managed to develop and become the second biggest producer and exporter of Hass avocados, second only to Mexico (Fruitrop Magazine, 2016), which has enabled them to achieved significant growth in its exports to EU and the UK (CIRAD, 2019), as shown in figure 1.3.

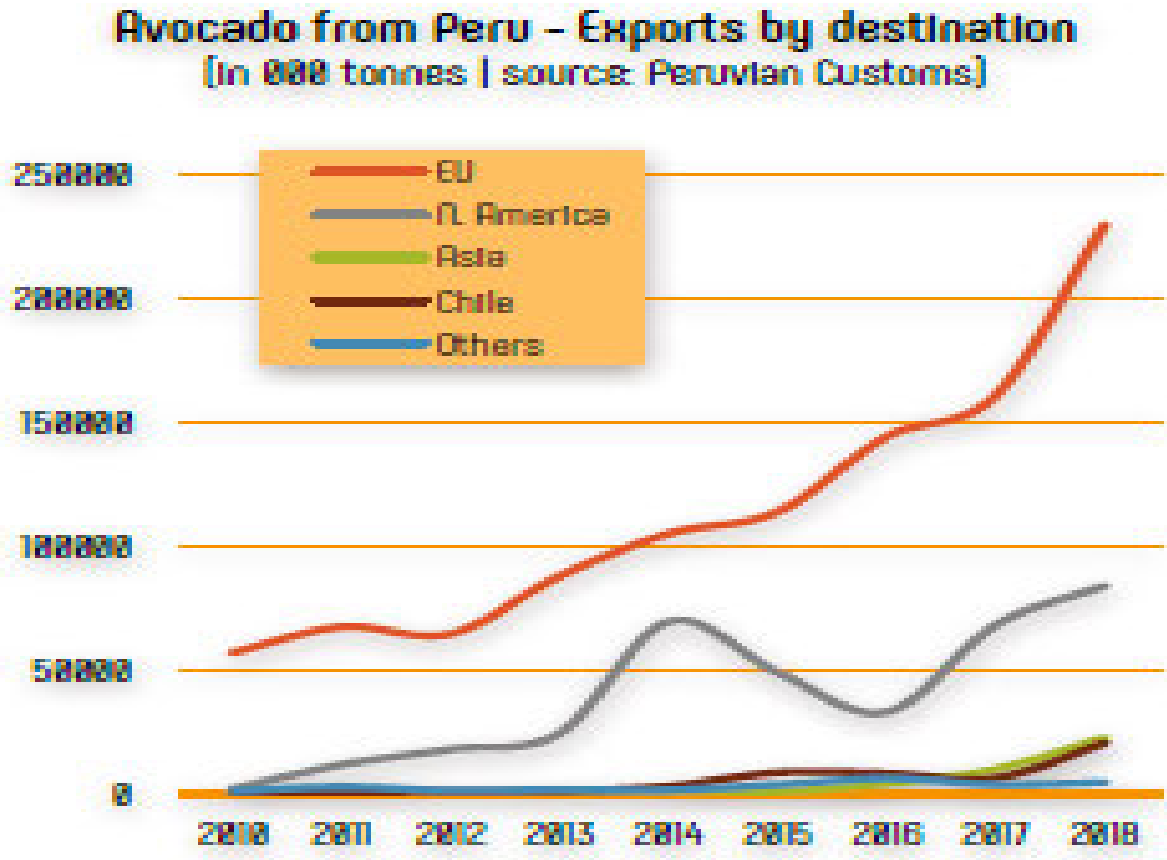

Figure 1.3: Peruvian avocado exports from 2010-2018

Source: CIRAD (2019)

The South African Department of Agriculture, Forests and Fisheries has identified Mexico, Peru, Israel, Kenya and Spain as potential top competitor for the South African avocados in the EU and the UK markets which are South Africa's major export destinations for the avocados.

According to DAFF (2019), South African avocado exports are declining while world avocado imports are growing in many EU countries and the UK. Furthermore, according to Donkin (2020), these markets have experienced a significant growth over the last five years. DAFF (2019, Page 24) stated that "these markets are dynamic and South Africa's performance in these markets should be viewed as an underachievement".

Many factors could be contributing to this phenomenon, and one of the significant factors could be the competitiveness of the South African avocado value chain, especially in the export markets. However, little information has been published in academic journals on the South African avocado value chain, and more specifically about the details of its structure, the value chain activities, factors influencing its competitiveness, the state of transportation and logistics and their influence on the competitiveness of this value chain, and current and future competitiveness of this value chain.

According to Mentzer (2004), many organizations and industries have been forced to change their competitive priorities due to rising consumer expectations, continually increasing competition on the world markets, time and quality-based competition and mass customisation. A number of events have indicated that major South African avocado industry's global rivals such as Peru and Mexico have changed their competitive priorities which have resulted in them to experience an increased competitive advantage over the South African avocado industry. No specific research has been done to identify how to position the South African avocado industry to cope with the current and expected future increased competition from its global rivals such as Mexico, Peru, Israel, Kenya and Spain.

Studies by Caixeta-Filho (2006), Cook *et al.* (2011), Sandberg & Abrahamsson (2012) and Wong & Karia (2019) were able to show that transportation and logistics in the value chain are an important aspect of the overall competitiveness of the value chain. According to SAAGA (2020), avocados exported from South Africa are transported by sea under controlled environmental conditions; and airfreight, a more costly form of transport, is only used when prices are exceptionally high. The major seaport for the South African avocado exports is the Cape Town Port, which is approximately 1800-2000 km from the main production regions. There used to be a specialised avocado train that ran to Cape Town weekly with only avocados, but this stopped because some trains of avocados missed the sailing of the weekly vessels resulting in a general perception amongst actors that it was not a reliable service and, hence, reduced demand for the service (Bard, 2020).

Effective strategic development should be informed by an understanding of how competitive a country/sector/firm is, in relation to others in the same playing field and how the competitive position has evolved overtime (Fagerberg & Srholec, 2017). Following on from Fagerberg & Srholec (2017) discussion on the requirements for a firm to successfully implement a competitive strategy, the actors in a value chain must understand their respective capabilities and the needs of the consumers to successfully implement a competitive strategy. The South African avocado value chain actors need to move away from their perceived narrative of an industry that is regarded as been experiencing a fairly steady growth in terms of production and demand. Some of the players in this industry are not aware of the world developments which include more entrances in the world avocado markets, unique consumer demands and improved production methods by other countries. Having information about the world developments, state of competitiveness of the major competitors and strategic actions needed to improve the competitiveness of the South African avocado value chain will benefit most players of this value chain in a significant way.

The South African avocado industry needs to properly position itself very well in the global avocado markets; given that world production is booming, it is crucial to examine the demand prospects (Imbert, 2019) and other factors that might be negatively affecting its functioning and competitiveness in the world markets. This study will try to fill relevant gaps in local research by providing a detailed competitiveness analysis of the South African avocado value chain. The information obtained during this analysis would be used to recommend strategic actions that the South African avocado value chain actors, especially agribusiness managers, could use to improve the current and future competitiveness of this value chain.

The research problem can be narrowed to following specific problems which are:

I. No specific research has been done to provide a detailed competitiveness analysis of the South African avocado value chain.

II. No analysis has been done to compare the performance and the competitiveness of the South African avocado value chain with those of its major global rivals.

III. No proper transport and logistic analysis have been performed on the South African avocado value chain.

IV. There is little information about strategic actions that are needed by this industry to prepare for the current and anticipated increased competition from the mentioned global rivals.

1.3 Research Objectives

The main objective of this study is to provide a detailed competitiveness analysis of the South African avocado value chain. This will be achieved through the following specific objectives which are to:

I. Determine the key players in the avocado value chain in South Africa
II. Determine the production and consumption trends in the South African avocado value chain
III. Measure and analyse the competitiveness performance of the South African avocado industry
IV. Compare the South African avocado industry's competitiveness with that of its major global rivals
V. Identify challenges, opportunities, and threats faced by the players who are in the South African avocado value chain
VI. Analyse the transportation and logistics processes for the South African avocado industry
VII. Identify factors which are negatively and/or positively influencing the competitiveness of this value chain
VIII. Formulate strategic actions that the key players might use to make the value chain more competitive.

1.4 Research Questions

Considering the research objectives outlined above, the following research questions will be examined to achieve the main objective of this study.

I. Which are the relevant actors within the local and export avocado value chain in South Africa?
II. Which internal and external factors most affect the competitiveness of the avocado value chain in South Africa?
III. How are the transportation and logistics processes affecting the competitiveness of the South African avocado value chain?

IV. How competitive is the South African avocado value chain in comparison to those of its major global rivals?

V. What are factors influencing the competitiveness of the South African avocado value chain?

VI. What strategic actions could improve the competitiveness of the avocado value chain in South Africa?

1.5 Justification of the Study

The South African avocado industry is regarded as one of the top South Africa's agricultural sub-sectors. This sub-sector is also one of the significant agricultural sub-sectors in relation to the National Development Plan (NDP) were the South Africa government wants to create one million jobs in agriculture by 2030. The recent decline in the performance of this industry in the global export markets, raises many concerns for various stakeholders (e.g., the government, industry participants and people who are depending on this industry) since about 50 to 55% of the total avocado production in South Africa is exported to global markets.

The South African avocado industry is in need of having a full understanding of its competitive state and the factors which are influencing its competitiveness for a more effective strategic development. This study will try to provide detailed information about the South African avocado value chain structure and actors, the functioning of the value chain, all the bottlenecks in this value chain and their effects, the state of the value chain's competitiveness and the factors which are influencing its competitiveness. This information could be very helpful to industry actors in trying to improve the competitiveness and the performance of the South African avocado value chain, especially when it comes to exporting this fruit.

1.6 Structure of the Dissertation

This dissertation is divided into nine chapters, each of which is largely self-contained. In the present chapter, the background of the study, the problem statement and the objectives of the study were outlined.

Chapter 2 is an overview of the South African avocado industry. This chapter set the tone for the overall dissertation by providing a summary of information about the South African avocado industry's current situation regarding production and consumption trends, and export information that will be used throughout this dissertation. This chapter also gives a brief theoretical framework of competitiveness and the overall methodology for this study.

Chapter 3 is the value chain mapping analysis for the South African avocado industry. This chapter puts forward a new and improved detailed value chain structure of the South African avocado industry, highlighting all the actors involved, significant processes, and supporting services.

Chapter 4 presents an analysis of the social networks found in one of the type producers identified in chapter 2. A case study involving one of the top avocado farms in the country was performed to determine the relationships that farm is involved with and how these relationships influences the functioning and competitiveness of this farm.

Chapter 5 is a quantitative competitiveness analysis of the South African avocado industry compared with its major global rivals. This chapter involved the use of globally recognized quantitative indices to measure and analyse the competitiveness of this industry and compared it with that of the industry's major global rivals.

Chapter 6 is a qualitative analysis which looks at the Strengths, Weaknesses, Opportunities and Threats experienced by the actors in the South African industry. This chapter put forward the Strengths, Weaknesses, Opportunities and Threats for the South Africa avocado industry at both farm and industry levels.

Chapter 7 is a complete analysis of the transportation and logistics processes involved in the South African avocado value chain in order to identify the effects of transport and logistics on the industry's competitiveness.

Chapter 8 presents a value chain analysis of the South Africa avocado industry. This is a final analytical chapter that puts everything that was done in all other analytical chapters (Chapter 3-7). Factors identified in those chapters were further analysed using Porter's competitiveness diamond.

Chapter 9 is a concluding chapter, in which conclusions from the study are drawn and strategic actions are recommended for South African avocado value chain actors to improve their competitiveness using major finding of the six analytical chapters.

CHAPTER 2: AN OVERVIEW OF THE SOUTH AFRICAN AVOCADO INDUSTRY AND A BRIEF THEORETICAL FRAMEWORK ON COMPETITIVENESS

2.1 Introduction

This chapter reviews the production, and export trends for the South African avocado industry as determinants and indicators of competitiveness. This is necessary to as on understanding of the performance of the South African avocado industry in terms of production growth, local and international consumption of the avocado fruit, and exportation of this fruit. This is important background for the analyses presented in subsequent chapters. This chapter also provides a brief theoretical framework on competitiveness, factors affecting value chains competitiveness, influence of transport and logistics on value chain performance, and the effectiveness of formulating and recommending strategic actions for value chain improvement. This framework is also relevant background for all the analyses presented in chapter 3 to 8.

2.2 An Overview of the South African avocado industry

2.2.1 Avocado production in South Africa

The biggest avocado producers and exporters in South Africa are Westfalia Fruit, ZZ2, The Fruit Farm Group, and HL Hall and Sons (Sikuka,2019). According to SAAGA (2021), even though the South African avocado industry is export-orientated, the South African market also plays a significant role, with demand having grown considerably in recent years. The South African avocado industry is projecting long-term growth, mainly as it looks to further international trade with Japan, India, and United States (Shukela, 2020). Donkin cited by (Cape Business News, 2019) stated that maintaining global market access for local produce is one of the industry's top priorities for the future.

The South African avocado production areas are presented in figure 2.1. As it was indicated in the introductory chapter, 99% of the avocados produced in South Africa are from Mpumalanga, Limpopo and KwaZulu-Natal provinces, and the remaining 1% is from the Western Cape and Eastern Cape provinces. The Limpopo and Mpumalanga provinces have a warm subtropical climate which is better suited to the production of avocados. In contrast, the Western Cape and Eastern Cape have much cooler weather (Sikuka, 2019); this enables the industry to produce avocados most times of the year.

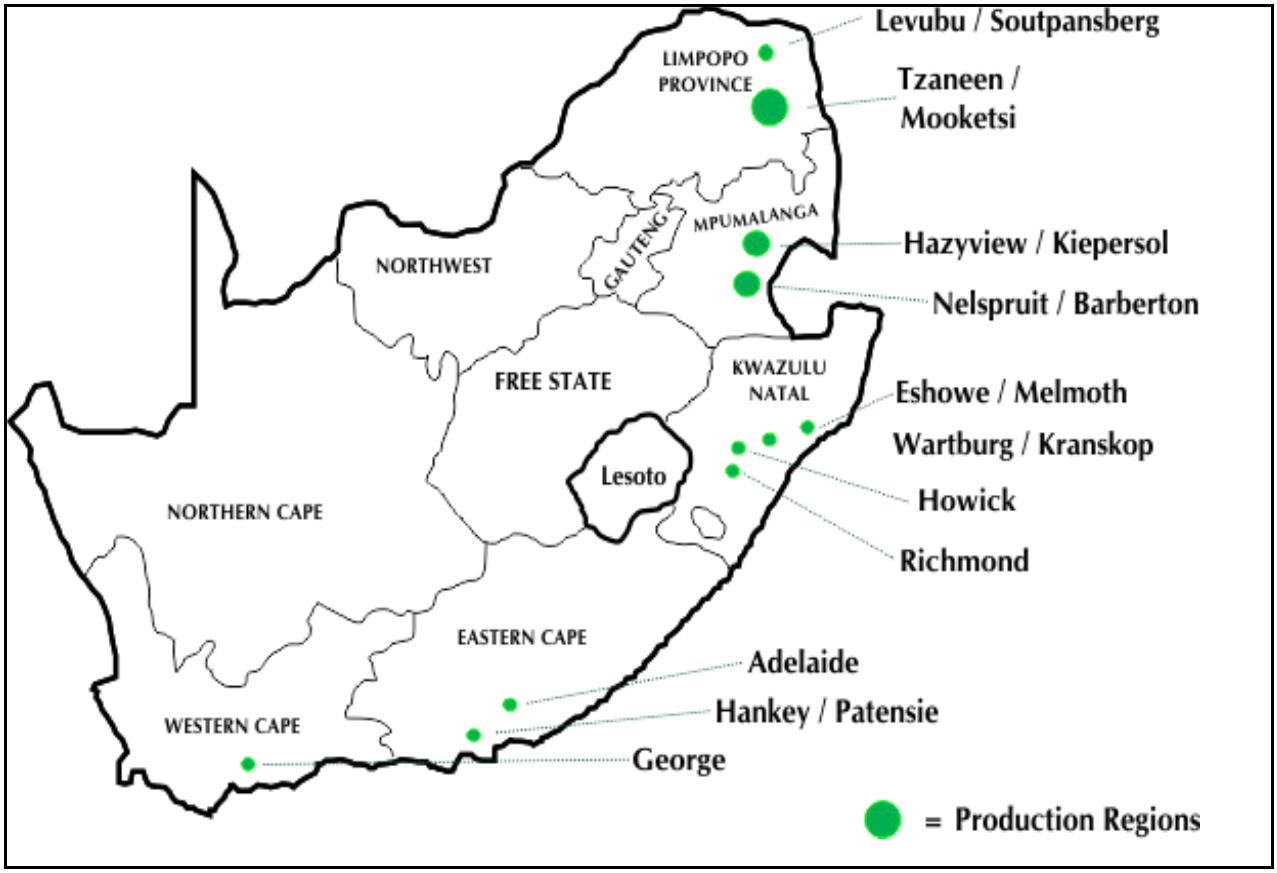

Figure 2.1: Avocado production areas in South Africa

Source: SAAGA (2020)

According to Cape Business News (2019), the industry is growing at more than 1000 ha per annum, with further expansion expected in the production of nursery trees. The area planted for avocados in South Africa is estimated to be 17 500 ha, and this growth in area is driven by land being diverted from other crops, new land developments, and under-utilized land, especially communal projects being resuscitated through leased agreements with commercial growers (Sikuka, 2019). Approximately 1.2 million tons of avocados was produced in the southern hemisphere during 2018 (DAFF, 2019). South Africa was number five accounting for 10.4% of total production in the southern hemisphere (Figure 2.2). According to DAFF (2019), All these countries are vying for the lucrative North American and European markets

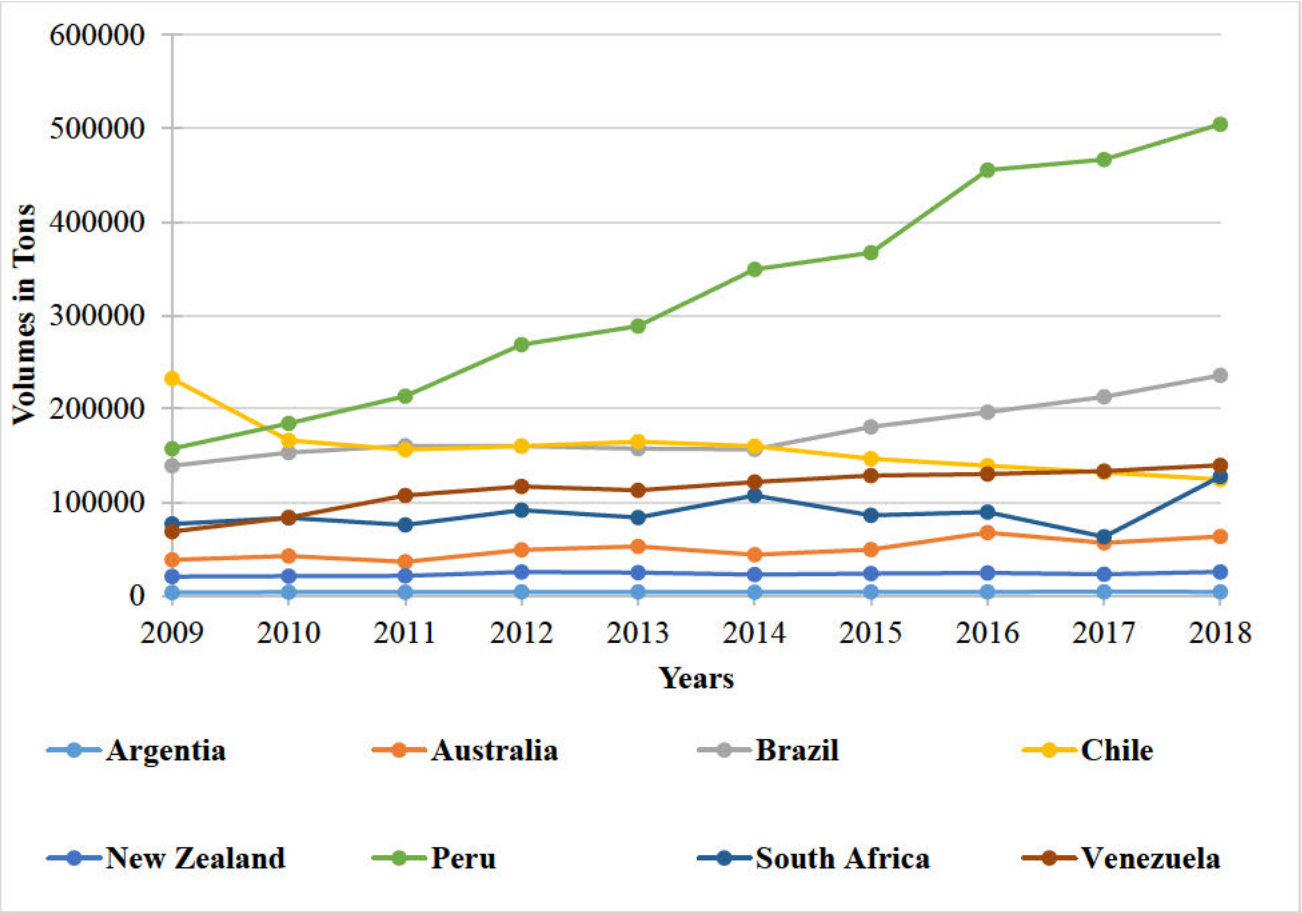

Figure 2.2: Southern hemisphere production of avocado 2009-2018

Source: DAFF (2017)

2.2.2 Avocado cultivars grown in South Africa

Hass, Fuerte, Pinkerton, Ryan, and Reed are the cultivars grown in South Africa with Hass accounting for 80% of the total area planted and the remaining varieties account for 20% (Sikuka, 2019). According to SAAGA (2020), due to climatic variability between growing regions, most of the major cultivars are available over an extended period during the season (for example, "Fuerte is harvested from March to May in the northern regions and is harvested in July and August in KwaZulu-Natal). South African cultivars and their harvest seasons are presented in table 2.1. This table reveals the availability of avocados by the South African avocado industry throughout the year. Such information is very important in developing a number of strategy by industry participants. According to this table, the South African avocado harvest season is from February until October. Detailed information with regards to the overall production and consumption will be discussed in chapter 5 of this dissertation.

Table 2.1: Avocado cultivars and harvest seasons in South Africa

Cultivars		Harvest Season											
		January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Hass	Limpopo/ Mpumalanga												
	KZN												
Fuerte	Limpopo/ Mpumalanga												
	KZN												
Pinkerton	Limpopo/ Mpumalanga												
	KZN												
Ryan	Limpopo/ Mpumalanga												
	KZN												
Reed/ Endranol	Limpopo/ Mpumalanga												
	KZN												

Source: Sikuka (2019)

2.2.3 Export market

The South African avocado industry is export-orientated with the EU and the UK markets being the main export destinations. According to Louw (2020), the main importing countries of the South African avocados are the European countries, namely Netherland, France, Spain, and the UK. The South African avocado markets are summarized in figure 2.3.

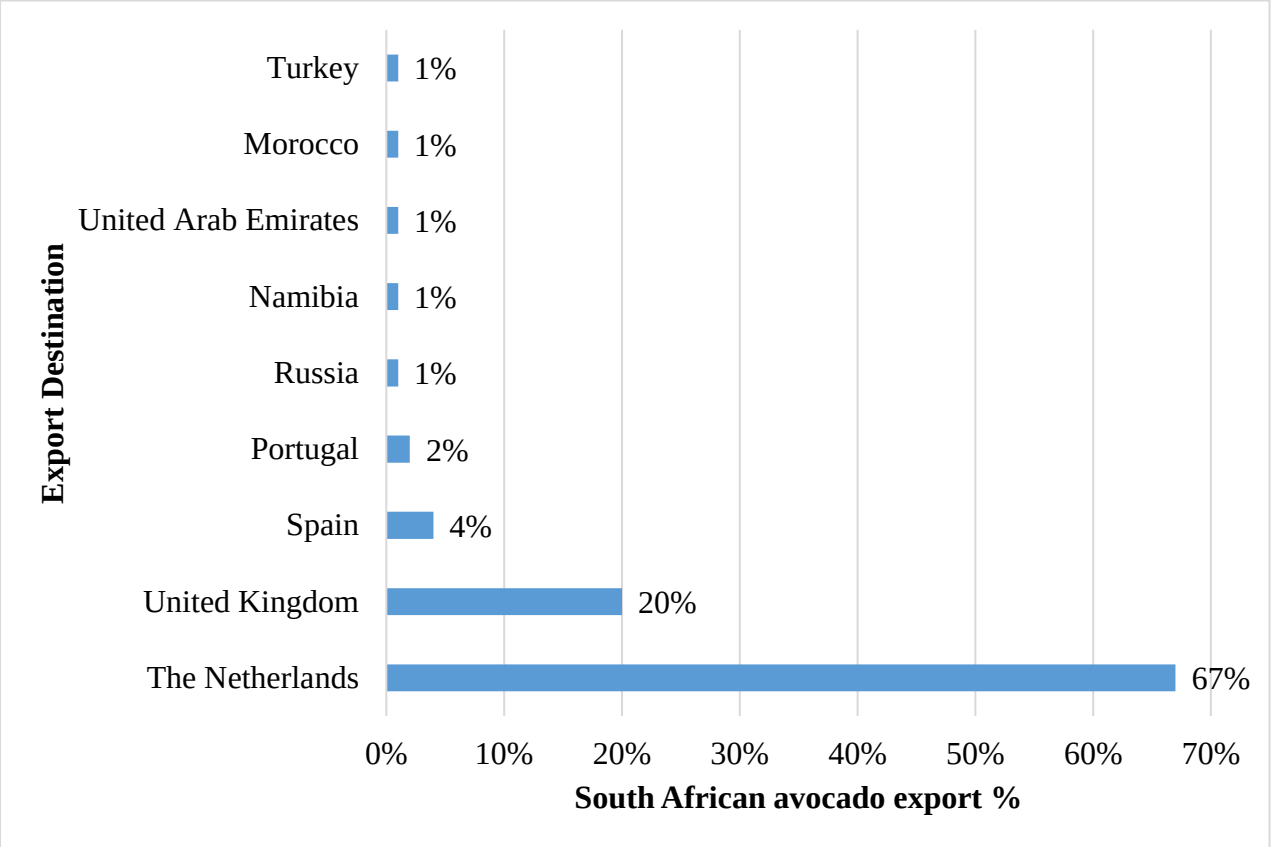

Figure 2.3: The South African avocado export markets

Source: Louw (2020)

The South African avocado export markets face many threats due to a possible future ban (Biacuana, 2019) and increased competition from global rivals (DAFF, 2017). The possible ban of South African avocados in its major export destinations, i.e., the EU and UK, would result from various concerns raised by consumers in these markets, including "ethical ground concerns". The "ethical ground concerns" stem from the water intensive nature of commercial avocado production and the possible detrimental impacts thereof on the environment and downstream (Biacuana, 2019). As part of preparing the industry for such a ban the South African government and SAAGA are in talks with the USA, China, and Japan governments to access these new markets which are characterized by strictly phytosanitary requirements.

Because the South African avocado industry is export-oriented, the gross value of avocado sales is strongly affected by international prices of avocados, as well as the strength of the Rand relative to currencies of the importing partners (Galal, 2021). Between 2000 and 2019, the nominal gross production value of avocado followed a comprehensive increasing trend, with a growth rate of more than 700 percent. As of 2018/2019, the gross value of produced avocados in South Africa was roughly R1,42 billion (Galal, 2021).

Having provided relevant background for the South African avocado industry and the dynamics that have contributed to not only its growth, but also its decline in ranking as an exporter of avocadoes. Section 2.3 introduces the concept of competitiveness. This is followed by a discussion of factors affecting competitiveness, and how to craft strategies to improve competitiveness in Sections 2.4 to 2.6. The final section presents a review of previous studies on the competitiveness of agricultural value chains and identifies useful insights from those studies for this research project.

2.3 The Concept of Competitiveness: A Brief Theoretical Framework

Competitiveness has remained one of the most challenging and controversial concepts, since there are many disagreements amongst economists about its measurements and appropriate indices to be used (Van Rooyen *et al.*, 2011). Competitiveness is a relative measure, and several ways can be used to measure it (Latruffe, 2010; Bahta & Malope, 2014). The choice of measurement is thus influenced by a particular question or facet of competitiveness that one wishes to address (Edward & Schoer, 2001). These authors stated that the choice of measurement technique or indices used is also subject to the availability of relevant data.

According to Feurer & Chaharbaghi (1994), there is no universal or exact definition for competitiveness since different organizations/firms may view it differently. These authors further mentioned the two common views of competitiveness by different organizations/firms. Some organizations view competitiveness as the ability of one organization to persuade or attract customers to choose their product or service over their rivals. In contrast, others view competitiveness as the ability to improve continuously on their production processes.

According to Van Rooyen *et al.* (2011), several studies have associated competitiveness with trade performance measures despite many studies arguing that trade performance measures do not adequately reflect the state of competitiveness. These authors further stated that in this view, industries and firms are competitive when they can continue to grow their trade in today's global environment, through product offers- qualities, prices, and services- that are as good, or

better than their competitors. This ability allows actors who are more competitive to attract sufficient scarce production factors (capital, land, labour, technology, and management) from competing for economic activities to sustain and expand their performance (Esternhuizen & Van Rooyen, 2006).

According to Falciola *et al.* (2020), most of the literature which defines competitiveness emerged in the 1980s and 1990s, and that literature can be divided into two streams/views. The first view associated competitiveness with lower labour costs and favourable home countries policies (Brander & Spencer, 1985; Krugman, 1994). The second view associated competitiveness with productivity (Porter, 1990; Krugman, 1990; Delgado *et al.*, 2012). The productivity-based view has emerged as one of the most used in defining competitivenessA study by Falciola et al. (2020) aimed at designing a multidimensional framework to measure competitiveness at the firm level, argued that the productivity view has two main issues when it comes to the applicability of the finding for policymakers who wish to improve the competitiveness state of their countries. Firstly, it does not provide information on the determinants of competitiveness, which means policymakers will not know which tools to use to improve competitiveness. Secondly, productivity only reflects a static measure of competitiveness, and it does not provide information about whether the competitiveness is ready to face changes in the economic environment. The concepts of comparative advantage and competitive advantage are commonly used to explain the issue of competitiveness, and the important foundations for understanding the importance of international trade in agriculture and to illuminate the underlying factors responsible for current trade patterns (Van Rooyen *et al*., 2013).

Improving competitiveness in the global markets is a driving force for entrepreneurs and policymakers (Seccia *et al*., 2015). Many developing countries exporters face a broad and diverse set of constraints that limit their potential to compete in the global markets (Farole *et al.*, 2010). Assessing export competitiveness starts with defining the objectives of an export strategy and understanding relative outcomes (Farole *et al.*, 2010). These authors also provided that the common measures for export performance include: the level (volume, share) and growth of exports; diversification of exports; and quality of exports.

According to Farole *et al.* (2010; Page 2), "the economic benefits of exporting have a long-established theoretical basis, specifically these include static efficiency gains derived from exploiting comparative advantage and improved allocation of scarce resources, as well as

dynamic gains in the more productive export sector engineered by higher competition, greater economies of scale, better capacity utilization, the dissemination of knowledge, and technological progress". In this quote, the authors express the importance of exporting for a particular industry. Such information can serve as a baseline in the development of strategies aiming at improving the export oriented industries. Furthermore, it can be used to track the progress of those industries as well.

2.4 Factors Affecting Chain Performance and Competitiveness

The resource-based view of the firm proposes that a firm must develop appropriate resources and capabilities that are valuable, rare, and difficult to substitute or copy to create a sustainable competitive advantage (Thompson and Strickland, 1998). According to Hardman (2002), this focus on the firm as the main unit of analysis overlooks the potential competitive advantages or disadvantages that are created by the linkages that a firm has with other players in the value chain. Value chain analysis can be used to provide an indication of competitiveness of each element or activity in the value chain (Van Rooyen *et al.*, 2013). According to Porter (1990), the agribusiness sector becomes more competitive through cost leadership and/or product differentiation. Kennedy *et al.* (1998) provided a number of factors which positively influences the competitiveness of the agribusiness sector and those factors are technology advancements, attributes of purchased inputs, product differentiation, production economies, and external factors which include government policies, exchange rates, consumer incomes and population growth.

Palandeng *et al*. (2018) revealed that supply chain management has a positive influence on competitive advantage and firm performance. According to Heizer & Render (2005), supply chain management may include establishing: transporters, credit and cash transfers, suppliers, distributors and banks, accounts payable, warehousing, order fulfilment, diving information on demand forecasts, production and inventory control activities.

2.5 Influence of transport and logistics on agricultural value chains

Transportation is one of the most essential factors in the marketing of fresh produce (Rout and Gardas, 2017). Globalization and increased competitiveness have led to transportation and logistics becoming one of the key elements in international trade (Mart *et al.*, 2014). According to Caixeta-Filho (2006), transportation and logistics are determinants of the competitive success of the agricultural sector since poor infrastructure may result in higher transportation costs and lead to longer delivery times during peak harvest seasons. Apart from being a

significant part of the costs in the chain, it is a critical component in the entire product flow that is akin to *a glue that sticks every aspect of the operations together*. Therefore, a robust logistic strategy can increase efficiency and help the supply chain survive in the long run (PLS, 2019). PLS (2019) contend that improved transportation networks will result in a reduction of shipment costs and increase service levels with little disruption to any process.

Figure 2.4 shows that perishable agricultural goods undergo various movements in the cold chain which are designed to maintain the quality of produce until it reaches the hands of the consumers in a desirable quality. The term "cold chain" refers to the management of the temperature of perishable products in order to maintain quality and the safety of perishable agricultural goods from slaughter or harvest through the distribution chain to the final consumer Yeoh (2017). The transportation and logistics of perishable goods involves refrigerated units, the energy to run them and load integrity requirements, which is why cold chain products typically are associated with higher transportation costs (Barcoding, 2017). Shipment of perishable goods must also involve consideration of the timeline of expiration (Lim & Hur, 2015). Improving the distribution efficiency of agricultural products cold chain logistics and ensuring the freshness, quality and safety of agricultural products has become a major focus of current logistics research (Wei & Lv, 2019).

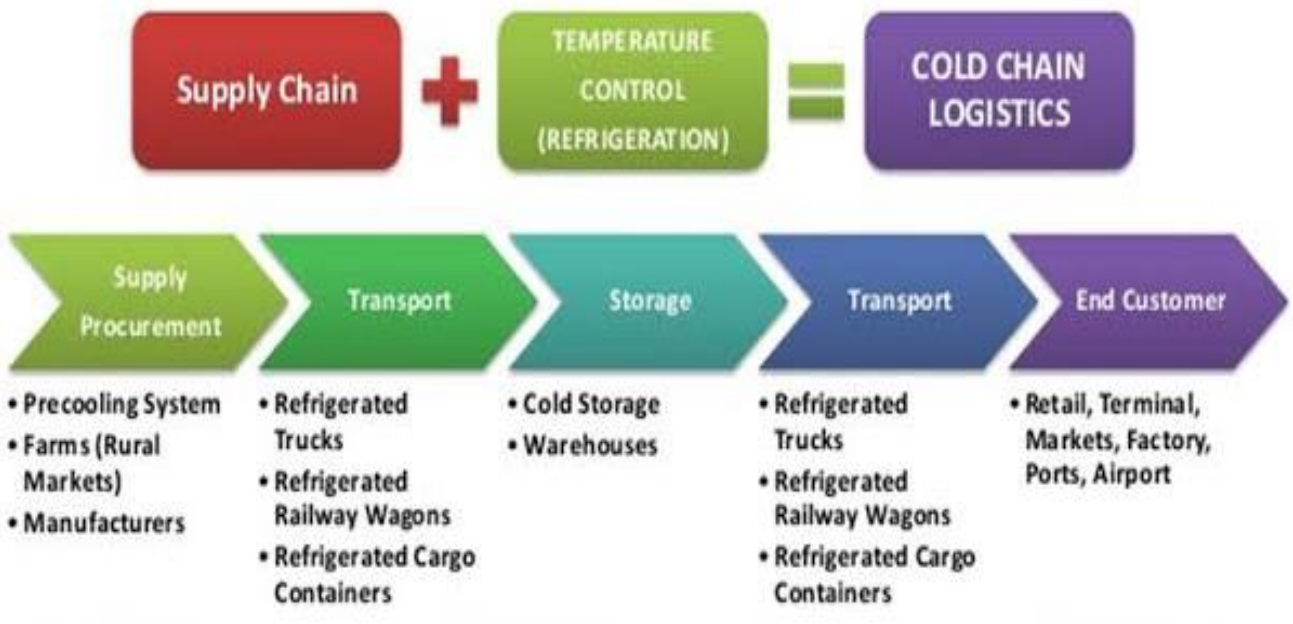

Figure 2.4: Cold chain of perishable agricultural goods

Source: Yeoh (2017)

2.6 Formulation of Strategies to Improve Chain Competitiveness

Dyson *et al.* (2007) defined the strategic development process as the management process that inform, shape and support the strategic decisions confronting an organization. Value chain analysis can be used to formulate competitive strategies, understand the source of competitive advantage, and identify and/or develop linkages and interrelationships between activities that create value (Ensign, 2001). According to Ensign (2001), competitive advantage strategies must be tied to how value chain participants can sustain a competitive position and achieve long term profitability.

2.7 Multi-step procedure for conducting a detailed competitiveness analysis of a value chain

This study aims to contribute to the body of scientific knowledge by providing detailed knowledge about the competitiveness of the South African avocado value chain at different components/parts of this value chain. This study also aims at contributing to the body of scientific knowledge by proposing a new analytical framework that could be used to perform a detailed competitiveness analysis of any productive value chain. The newly proposed analytical framework is a ***7-steps-6-analyses*** framework (Figure 2.5) and it will be used to achieve the overall objective of this study. Based on this framework, a study of competitiveness will include the following components:

Analysis 1*: Value Chain Mapping*

Analysis 2*: Social Network Analysis*

Analysis 3*: Competitiveness Assessment*

Analysis 4*: SWOT Analysis*

Analysis 5*: Logistics and Transportation Processes Analysis*

Analysis 6*: Value Chain Analysis*

GOAL*: Propose strategic actions that value chain actors could use to increase chain competitiveness*

Various researchers have used these analyses in various **agricultural** (Blignaute (1999); Aghazadeh (2004); Erik & Judit (2005); Esterhuizen (2006); Javanmard & Mahmoudi (2008); Chagomoka *et al.* (2004); Van Rooyen *et al.* (2011); Fliehr (2013); Bahta & Malope (2014); Almodarra & Soghaian (2016); Alarcon *et al.* (2017); Kiambi *et al.* (2018); Neves *et al.* (2019)

and Dewberry (2020)), and **non-agricultural** (Abrahamsson *et al.* (2003); Thompson *et al.* (2007); Butts (2008); Barysienė *et al.* (2015); Bordoloi & Nath (2015); Candemir & Celebi (2017) and Chofreh *et al.* (2019)) studies to achieve specific objectives to address particular value chains and other significant performance challenges. No agricultural or non-agricultural studies have ever tried to combine these analyses to address a specific value chain issue (in this case which is competitiveness of the South African avocado industry).

This study of the competitiveness of the South African avocado industry will include each of these seven steps. The first six steps of this analytical framework consist of six different analyses which have the potential to analyse value chain competitiveness at various parts of the value chain. Furthermore, by doing all these analyses, a more detailed competitiveness analysis of the value chain will be achieved. Moreover, the final 7th step involves a critical analysis of all the major findings of the six analyses in order to develop strategic actions that could be used to improve the overall competitiveness of the value chain. The methodologies and findings of these analyses are reported in chapters 3-8 of this dissertation. When it comes to those methodologies, this study will either adapt and/or advance the methods and materials used in those analyses of the studies mentioned above to conduct a detailed competitiveness analysis for certain components/parts of the South African avocado value chain.

This study will be analysing the overall competitiveness of the South African avocado value chain rather than competitiveness of individual firms in this value chain. This because, according to Ortmann (2001), several studies have clearly pointed to the increasingly role that competitive value chains, rather than competitive individual firms, will play for particular industries/firm clusters to capture a greater share of local and/or world markets. Recent events in the South African avocado industry which were highlighted in the introduction of this study have indicated a major gap when it comes to the understanding of the overall competitiveness of this value chain. Findings of the proposed study will be used to develop collective strategies to increase the overall competitiveness of this value chain.

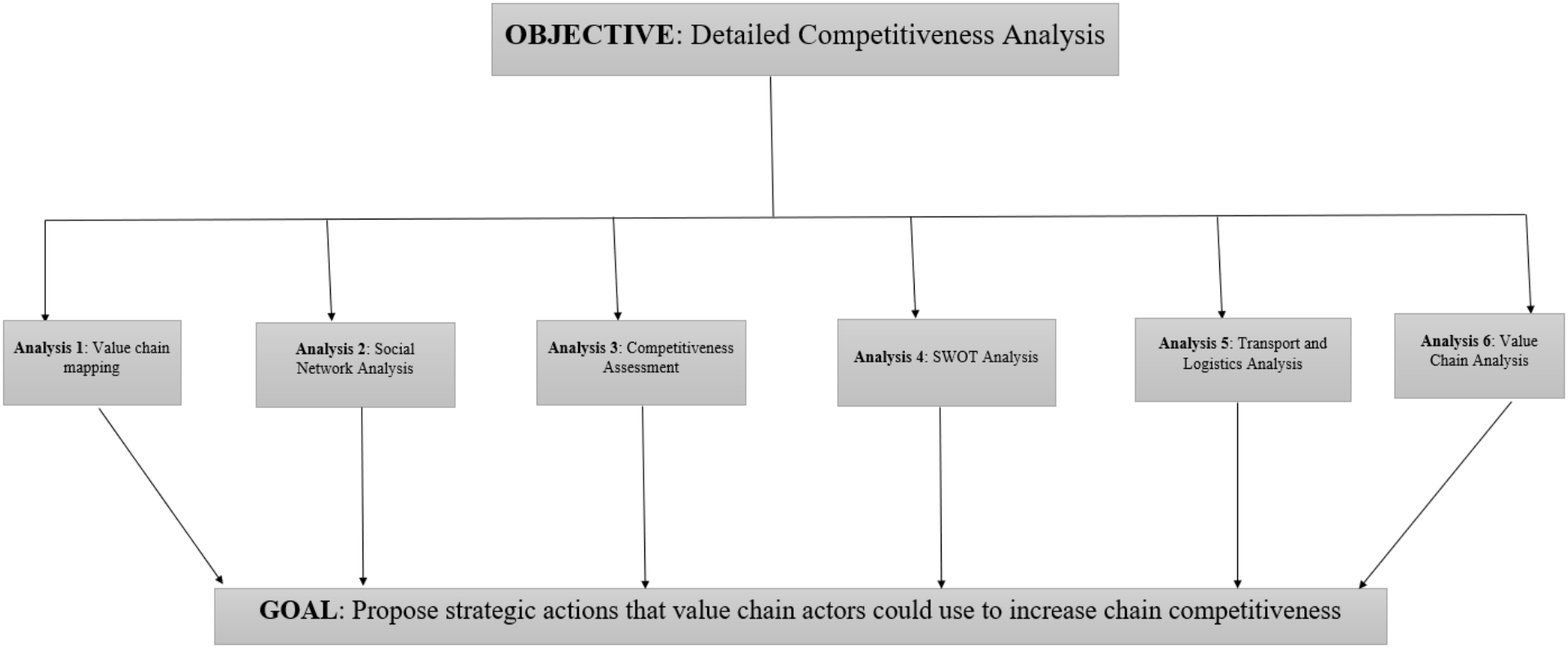

Figure 2.5: The Analytical Framework proposed for this study

Source: Own processing

2.8 Conclusion

From the information above, the South African avocado industry is a growing industry mainly because of increased demand for this fruit both locally and internationally. The consumption of this fruit also continues to grow both locally and internationally. Both SAAGA and DAFF have identified this industry as export-orientated, with the European markets being the industry's biggest export destination. Even though this industry is export-orientated, the local market also plays a significant role. Different countries have been identified as a threat to the South African export markets. Preparing and developing strategies to help this industry to cope with the current and expected competition from these rivals would be of great benefit for this industry. This information obtained from this chapter will serve as a background information for this dissertation since it will be used as a baseline in identifying and analysing the competitiveness of the South African avocado value chain.

Given that the South African avocado industry has experienced a major decline in the export markets and various evident indicate that this decline might be as a result of the competitive state of this industry. No South African avocado studies have been conducted in order to support this evidence. This study aims to present a more detailed competitiveness analysis of the complex nature of the South African avocado value chain by providing information about the factors, challenges and/or bottlenecks which are influencing the performance and the competitiveness of this value chain. To achieve this, different components of this value chain will be analysed to identify what is the state of competitiveness and how does the functioning of those components affect the overall competitiveness of this value chain. In the process of doing that, the researcher has put forward a systematic analytical framework which could be used in providing a detailed competitiveness analysis of any productive value chain. In the end, the researcher hopes to put forward a number of strategies that could be used by the South African avocado value chain participants, such as producers, packers, processors, exporters and agribusiness managers to use to make the South African avocado value chain more competitive for current and future purposes.

CHAPTER 3: VALUE CHAIN MAPPING OF THE SOUTH AFRICAN AVOCADO INDUSTRY

Abstract

The South African avocado industry ranks high amongst suppliers of avocados to global markets. However, its rank has declined, suggesting that its competitiveness has declined. Relatively little information has been published in academic journals about the South African avocado value chain, its detailed structure, information about its actors and activities, and its current and future competitiveness. The aim of this chapter is to produce a detailed South African avocado value chain structure with the objective of providing greater transparency of the industry, to assess its competitiveness and to aid strategic planning at the industry level. This chapter uses an eight-step analytical framework for value chain mapping to generate thorough knowledge about the structure, actors, supporting services, processes, the flow of avocados in the South African avocado value chain and to identify challenges/bottlenecks that the value chain actors deem to affect their competitiveness.

This chapter presents a detailed structure of the South African avocado value chain, and identifies challenges that constrain its functioning and competitiveness. The map identified input suppliers, producers, processors, wholesalers, NFPM, hawkers and vendors, retailers, and consumers as the main actors while marketing firms/agents/exporters, the Department of Agriculture, the Port of Cape Town, FPEF and SAAGA as supporting actors in the South African avocado industry. Producers of avocadoes may be divided into three categories that reflect the importance of Social Networks within the South African avocado value chain. The availability of nursey trees, costs of transport from production areas to port and from port to export destinations, the reliance on one major port and one major export destination (which is currently under threat from global rivals like Peru and Kenya), and relatively little government support were identified as factors impacting negatively on the functioning and the competitiveness of this value chain.

Keywords: Value chain mapping, South Africa, avocado, SAAGA, actors

3.1 Introduction

Analyses of value chains of agricultural commodities typically aims to (a) create maps of their structure (Neves & Trombin (2012); Rajashekariah & Chandan (2013); Mckague (2014); Bordoloi & Nath (2015) and Alarcon *et al*. (2017)) and investigate and address value chain challenges (Hardman *et al.* (2002); Esterhuizen (2006); Mashabela & Vink (2008); Spies (2011); Van Rooyen *et al.* (2011); Van Loeper *et al.* (2016) and Sibulali (2018)). Value chain mapping is an essential first step in value chain analysis to enable the researcher to entirely comprehend the circumstances of the gathering and analysing the data and, at the later stage, to facilitate the development of strategies to improve the chain performance (Attaie & Fourcadet, 2003). It is essential to know the actors involved in the chain, core processes, activities that each actor undertakes, product flow, the actor's knowledge on the quality requirements of the products, and the geographical flow of the produce (Kavithambika *et al.*, 2020). Mapping the value chain will help to better understand the connections between actors and processes; demonstrate interdependency between actors and processes and create awareness of the stakeholders to look beyond their involvement in the chain (Bellu, 2013).

The concept of value chain mapping was popularised and made more relevant to agriculture and agribusiness by Professor Marcos Neves of the University of Sao Paulo and EAESP-FGV Business School, Brazil. He has developed and modified various methodologies for value chain mapping and applied those methodologies in several studies, including Neves *et al.* (2004), Neves (2007), Neves *et al.* (2010a), Neves *et al.* (2010b), Neves & Trombin (2012), Neves *et al.* (2013), Neves *et al.* (2014), Neves *et al.* (2016), and Neves *et al.* (2019). The main aim of these studies was to generate knowledge about the magnitude of the economic and social development of the production chains in their countries by mapping and quantifying them. Studies conducted by Neves and various co-authors, with the most recent one being Neves *et al.* (2019), have demonstrated three benefits of value chain mapping. The first benefit is that a complete overview of a chain produced by mapping provides greater transparency to the sector, clarifies and questions fallacies, and adds value to the chain's image. Secondly, the collected information allows for the collection of market intelligence that can support structuring a strategic plan to identify innovations in businesses, explore new opportunities, and raise the sector's competitiveness. Lastly, the information may also be used to support decision-making in both the public and private sectors and to inform policy recommendations.

Value chain mapping has been applied in various agricultural studies (Spies, 2011). For example, Alarcon *et al*. (2017) mapped the food systems of beef, sheep, and the goat in Nairobi

to understand the dynamics of these systems and identify existing structural deficiencies and vulnerabilities of these value chains. As a result, these researchers were able to provide policy recommendations to improve these systems. Kiambi *et al.* (2018) mapped the dairy food systems to identify and assess the structure and functionality of Nairobi's cattle dairy value chain. As a result, the researchers created and understood the structure of the dairy system operations in Nairobi. Using their findings, they were able to recommend policy interventions that targeted every segment of the value chain to enhance the system's efficiency.

A review of agribusiness literature on value chain mapping indicates that whilst value chain mapping is sometimes conducted as a stand-alone technique in trying to develop and explain the structure of various value chains. For example, Jeckoniah *et al.* (2013) and Osuji *et al.* (2017) used value chain mapping to investigate the gender roles of actors across the value chain,), Mmasa & Msaya (2012); Kiambi *et al.* (2018); Tubene *et al.* (2018) and Franssen (2020) identified the value chain actors and their roles, value chain processes, linkages between actors and the flow of produce, and Asiedu *et al.* (2016); Alarcon *et al.* (2017) and Onomo *et al.* (2018) used value chain mapping to identify factors affecting the functioning of value chains. In those studies, researchers used value chain mapping to gather information about the industry which included information about industry participants, processes in the value chain and linkages between value chain participants,

However, value chain mapping is also frequently conducted as an initial step in value chain analysis studies, e.g., (Rajashekariah & Chandan (2013); Mckague (2014); Chumaidiyah (2014); Eckert & Latane (2014); Bordoloi & Nath (2015); Chofreh *et al.* (2019) and Neves *et al.* (2019)). In those studies, the purpose of the of the value chain mapping exercise was used to identify the actors of those value chains. Masegela & Oluwatago (2018) and Senyolo *et al.* (2018)) are examples of South African studies that used value chain mapping as a first step in their value chain analysis studies.

There is a trade-off between the methodologies of previous value chain mapping studies and the methodology proposed for this chapter, i.e., the former group of studies are more data intensive because they include both the magnitude of the social and economic aspects of the value chain during value chain mapping. In this study the primary purpose of value chain mapping is to producing a more detailed structure of the South African avocado value chain that will identify all the value chain actors, the functions performed by these actors and other activities in this value chain. It is the first step in a multi-step analysis of the value chain.

Therefore, it is more similar to the latter group of the above-mentioned studies. This analysis elicits important information that is subsequently used in the analyses presented in Chapters 4 to 8 of this dissertation. This study adapts some of the mapping techniques used in the studies mentioned above and attempts to improve on them by combining them with other methods from other studies to produce a more-detailed structure of the South African avocado value chain.

The next section provides a short overview of the peer-reviewed literature on value chain mapping and its different techniques. Section 3.3 provides an overview of the methodology to be used in this chapter. The South African avocado value chain structures and the bottlenecks in these value chains are presented in section 3.4. Conclusions are drawn in section 3.5.

3.2 Value chain mapping and value chain mapping techniques

The aim of this section is to present an overview of the peer-reviewed local and international economic literature on value chain mapping and its different methods. This is done to identify a method(s) of value chain mapping that could be used to achieve the objectives of this chapter.

According to McComick & Schmite (2001), value chain mapping creates a visual representation of the connection between actors in the value chain and other stakeholders. In addition, value chain mapping provides clearness on which activities to enhance internal and external functions concerning other entities like suppliers, distributors, and consumers (Chumaidiyah, 2014). According to Umberger (2014), value chain mapping is the initial process in value chain analysis that aims to identify primary and supportive business activities and all related components and the relationships between them in the corporate value chain. Value chain mapping is significant for the knowledge creation about the specific manufacturing process of a company/industry, analysing the trends, and providing solutions to emerging business problems (Tonelli *et al.*, 2016). Value chain mapping in most studies has been used as an initial step in value chain analysis in which the business identifies the main activities related to product and service lines for better performance improvement opportunities (Jones, 2016; Chofreh *et al.*, 2019). Value chain mapping allows experts to expand their perspective on company opportunities and risks and improve the quality and efficiency of performance assessments (Mooney, 2014).

Value chain mapping is considered a standard tool in value chain research and analysis. It helps to explain and understand the processes a product goes through before it reaches the final consumer (Masegela & Oluwuntayo, 2018). The objective of this value chain analysis tool is

to facilitate analysis effectively. That is why the tool must be simple enough to be applied while providing sufficiently valuable results to be used in decision making (Buxton *et al.*, 2005). A study that was conducted by Chofreh *et al.* (2019), which was aiming at mapping value chain processes of water and waste industry towards a sustainable solution used methods such as "in-depth interviews with top managers, experts, and contractors, document analysis, informal discussions, and direct observation" to carry out their study. Mwakalinga (2014) provided a detailed list of questions that need to be answered by the researcher(s) during the mapping process of the value chain. According this author, answering these questions helps the person/company/industry to have a map that includes all the essential aspects of that industry. For example, what are the different (core) processes/functions in the value chain? Who are the actors involved in these processes, and what do they do? What are the flows of product, information, and knowledge in the value chain? What is the number of actors, the volume of products, employment provided by the chain actors? Where does the product (or service) originate from, and where does it go? How does the value change throughout the chain? What types of relationships and linkages exist between the value chains? How do you evaluate the relationship? Cooperative? Competitive? Rival? What type of (business) services is feeding into the chain? Who are the dominant players, and where are they located value chain?

According to Emana & Nigussie (2011), value chain mapping is one of the four aspects (Identifying the distribution of benefits of actors in the chain, examining the role of upgrading within the chain, and role of governance) of value chain analysis that has been applied in agriculture. These authors went further to state that "mapping assesses the characteristics of actors, profit and costs structures and flows of goods throughout the chain, employment characteristics, and the destination, and value of domestic and foreign sales".(Emana & Nigussie, 2011; Page 6) The following eight steps are involved in value chain mapping (Emana & Nigussie, 2011): a) Mapping the core processes in the value chain, b) identifying and mapping the main actors involved in these processes, c) mapping flows of products, information and knowledge, d) mapping the volume of products and the number of actors, e) mapping the geographical flow of the product or service, f) mapping the value at different levels of the value chain, g) mapping relationships and linkages between value chain actors, and h) mapping business services that feed into the value chain.

Mooney (2014) provided the reasons below, explaining why value chain mapping is a good solution for transforming businesses towards sustainability. a) The value chain mapping process provides a platform for communication and discussion with stakeholders. According

to Mooney, "this enhances the internal understanding of business opportunities arising from the external environment of an organization. b) The mapping process reveals missing information, including needs, impacts, and gaps for each entity in the value chain. According to Mooney, "this enables organizations to see which stakeholders need to be involved in a sustainable value chain, which stakeholders need to be examined for further disclosure and to identify business activities that need improvement. c) Mapping the value chain extends the perspective of experts in providing concrete ways of thinking about the external environment of an organization

Value chain mapping and quantification provide knowledge of the size of the production chain analysed in terms of the social and economic magnitude of all the links that comprise it (Neves & Trombin, 2012). According to Neves (2007), the information collected during value chain mapping allows for gaining market intelligence that can support the structuring of a strategic plan to identify innovations in business and explore new opportunities and raise the competitiveness of the sector. Neves & Trombin (2011) further stated that information may also be used to support decision-making in the public sector and companies operating as individuals or collectively. A method for mapping and quantifying the value chain was developed by Neves *et al.* (2004), which is a six steps method as shown in figure 3.1. According to Neves *et al.* (2010a), the application of this method is relatively simple and straightforward, and the collection of information does not depend on public sources of data. The information obtained using this method allow for easy visualization of positioning and the relevance of different sectors in an existing value chain.

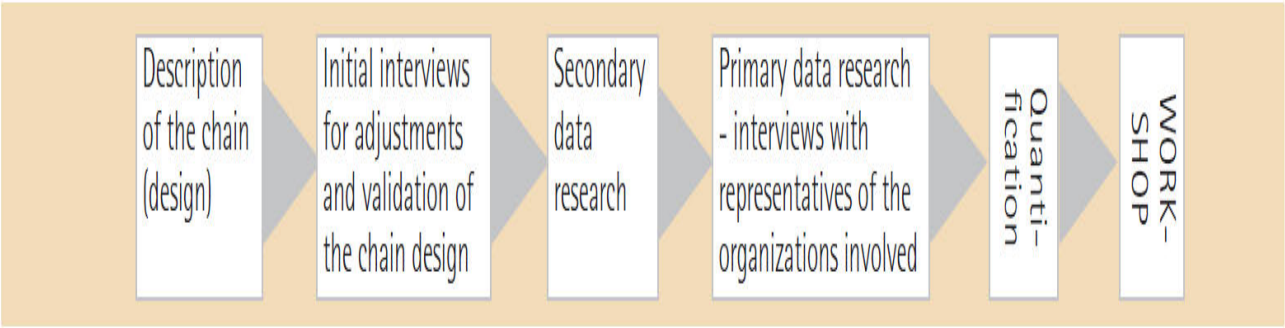

Figure 3.1: Method for mapping and quantifying value chain

Source: Neves *et al.* (2004)

Neves *et al.* (2004) explained that the first step of mapping and quantification, as shown in figure 3.1, involves elaborating a preliminary design of the chain based on theory and

researcher's experience. During this step, it is crucial to scope which segments will be studied, keeping the focus on the system's central axis due to the research's objective(s). The second step is to submit it to specialists and interview them as they will have to propose possible adjustments to obtain the correct condition of the system. The third step consists of secondary data that have to be collected from sources that have academic and statistical credibility, reputation, and integrity. In the fourth step, primary data is collected through interviews with representatives of several organizations in a value chain to be analyzed. Neves *et al.* (2004) explained that to select and define the interviews, researchers first need to identify which data was not found in the secondary data and which agents in the chain must be selected for interviews. According to Neves *et al.* (2010a), to be selected for an interview, an agent should have certain characteristics i.e., "must have access to the information and data of the sector in the study, must have knowledge and experience about the system, must be willing to collaborate with researchers and promote communication for future contacts, additionally, must be able to indicate possible contact agents who will contribute with unavailable data" (Neves *et al.*, 2010b; Page 50). The fifth step consists of quantification, which involves determining the turnover of each sector in the chain, through the company revenues and estimates of several sub-sectors of the chain. In the last step (sixth), a workshop is organized and a discussion of the proposed structure and the information associated with it.

Many researchers have defined value chain mapping as a technique to create a virtual representation of a company/industry/organization that provides details about the flow of goods and services from raw material until it reaches the hands of the consumers. However, there is no universal methodology that has been developed to conduct value chain mapping. Researchers have used a range of methods to carry out this analysis, and the methods used have, in part, depended on their research objectives. The purpose of the next section is to present a methodology for value chain mapping that is suited to the objectives of this study.

3.3 Methods and Materials

The objectives of value chain mapping in this study are to:

- *Identify the South African key avocado value chain actors through a detailed value chain mapping technique,*
- *Identify transformation steps of functions, relationships amongst value chain actors and supporting services, and*

- *Identify challenges/bottlenecks which are preventing the value chain actors to be more competitive with their local and international competitors*

To achieve these objectives, an eight-step analytical framework (shown in Figure 3.2), was developed, and used in this chapter. The methodology combines methods used in studies by Neves *et al.* (2019), Mckague (2014), Donovan *et al.* (2015) and Mooney (2014). Some of the methods have been modified by the inclusion of additional steps in order to better achieve the main objectives of this chapter.

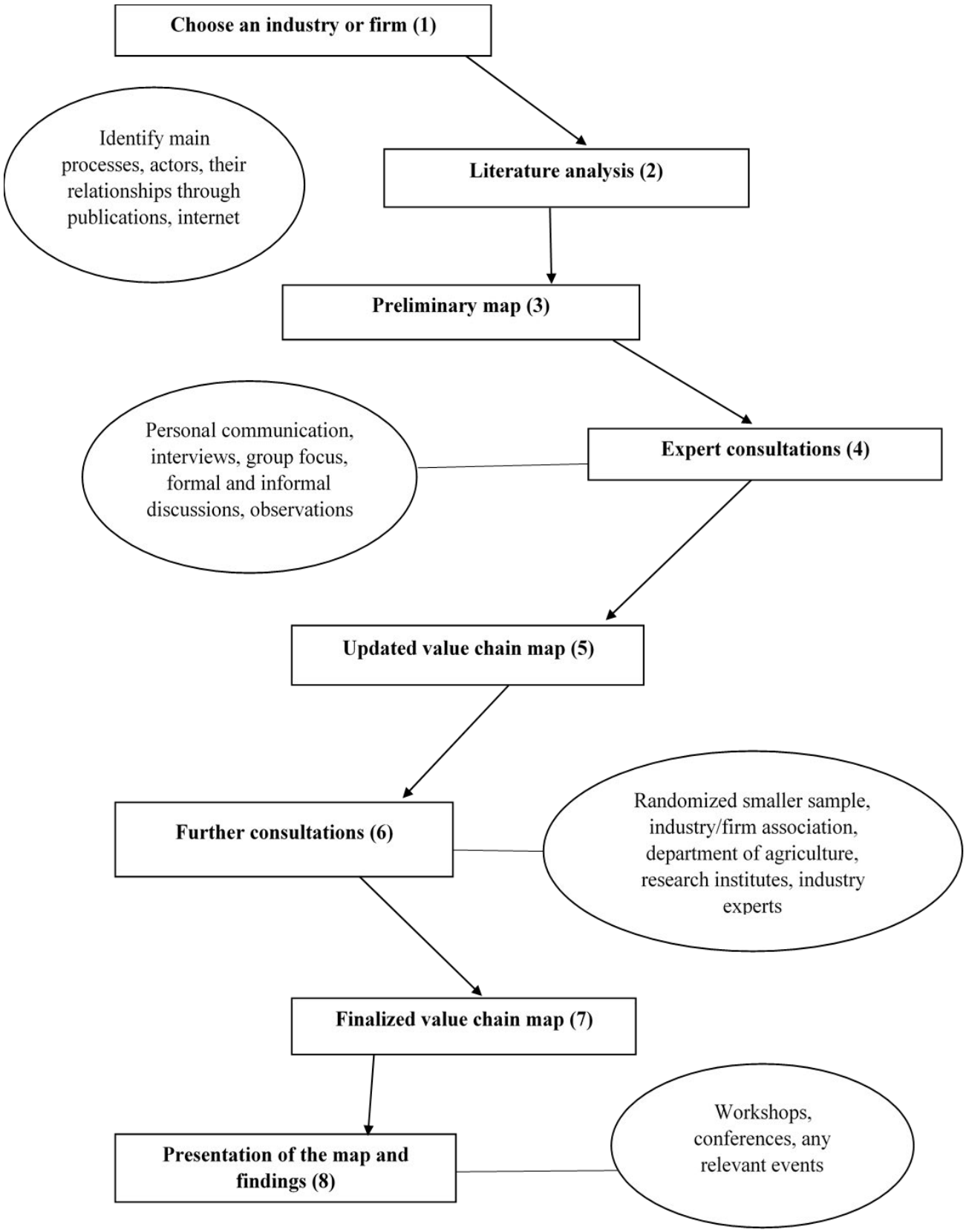

Figure 3.2: Value chain mapping methodology

Source: Own processing

These steps of the multi-step analysis presented in figure 3.2 are detailed below:

Step 1: Choose an industry/firm value chain to map

According to Mckague (2014), the process of selecting or choosing a value chain to study or analyse involves selecting the evaluation criteria, gathering information, and narrowing down the shortlist of candidates until the final value chain(s) is selected. Mckague (2014) used specific criteria to select a value chain of study. These criteria were sustainability, the benefit for the poor, gender equity, environmental sustainability, sufficient resources, speaking with industry experts, and previous experience in the sector. This author also stated that these criteria may be modified by researchers or organizations depending on the nature of their studies. According to Donovan *et al.* (2015), the selection of indicators/criteria, an extensive period of data collection and analysis, and one or more workshops to present results and make the decision are some of the steps involved during value chain selection.

For this study, the South African avocado value chain was selected with an aim of developing a much-detailed value chain structure which is accurately representing the South African avocado industry. The criteria that were used to choose this value chain were its state of competitiveness, especially in comparison with the industry's global rivals, the impact it might have for this industry if it continues to decline at the rate at which it is declining at, and to provide more knowledge about the structure of this value chain and the functioning of it. Furthermore, this analysis aims to identify key players in the South African avocado value chain, transformation processes, supporting services, and identify problems that these actors view as constraining the value chain functioning and competitiveness.

Step 2: Literature analysis

The purpose of this step was to gather all the published/unpublished information and information from key informant about the South African avocado industry in order to be able to develop a preliminary structure of the South African avocado value chain. Publications by the South African department of agriculture, SAAGA, universities, Bureau for Food and Agricultural Policy (BFAP), National Agricultural Marketing Council (NAMC), newspaper articles, public statements by avocado value chain actors, presentations done by avocado value chain actors, websites of avocado producing firms, and journal publications were all the resources that were used to perform literature analysis to gain an insight about the South African avocado industry. Consultations with a number of key informants were also used for this step, and it was helpful with confirming and getting more details about the mentioned

resources. The key informants were made up of value chain participants who are producers, packhouse managers, exporters and SAAGA officials. Key informants also a perfect source of transformation steps of functions (which are defined as the stages a given product goes through along the supply chain) for the South African avocado industry. In total the study used 23 key informants.

Step 3: Develop a preliminary value chain map based on step 2

The objective of this step was to develop a preliminary structure of the South African avocado value chain based on the information collected in step 2. Developing a preliminary version of a value chain map can be initiated during the early stages in the data collection process, especially when the researcher comes across relevant information (Mckague, 2014). Based on the information that was collected in step 2, a preliminary value chain map representing the South African avocado industry was developed by the researcher. The value chain structure that was developed in this step was a very simple structure which consisted of the main actors (input suppliers, producers and consumers) and activities which are found in most value chain of other fruits in South Africa.

Step 4: Consultations with industry/firm value chain actors

The objective of this step was to obtain additional information and feedback from industry participants that will be used to groundtruth the preliminary map, amend it, where necessary, and to furnish it with additional details. The preliminary value chain map developed in this study was sent out to all SAAGA members (N=409) with the CEO of The South African Subtropical Growers' Association (Subtrop), Mr Derek Donkin serving as the gatekeeper. The responses then were returned to the researcher by the participants. SAAGA members were used for this analysis because this organization's producers make up 90% of the total number of avocado producers in South Africa. SAAGA also has other different actors such as biological input suppliers, packhouses, processing firms, and traders who are found in the South African avocado value chain as their members.

A preliminary map was then developed based on the information obtained during step 2. This document was sent out to the actors, accompanied by unstructured questions that were designed to elicit important information relevant to achieving the objectives of the analysis. During this step, the actors, including SAAGA, were asked to consider and to propose corrections to preliminary structure of the value chain based on their knowledge about the industry.

Step 5: Update value chain map developed on step 3 with adjustments, criticism, feedback, and comments from step 4

Based on the adjustments that were put forward by value chain actors who participated in step 4, the preliminary value chain structure that was initially presented was then updated. In addition, the value chain actors put forward links that were missing, additional value chain actors, supporting services, and even recommended that some of the actors or processes proposed initially to be removed. During step 4, some of the actors raised concerns about the complexity of the proposed map, and they requested that, if possible, the researcher should produce separate value chain maps that will represent the local and export markets separately. Due to the fact that there was no clear consensus about the structure of the value chain amongst participants, two different structures representing the South African avocado industry were developed in this step which were used as part of further consultations in step 6.

Step 6: Further consultations with a few sampled value chain actors and/or body/association in which the industry/firm falls under

Further discussions with key informants help to understand the linkages and the gaps between the different strands of the value chain (Rajashekariah & Chandan, 2013). For this step, the two value chain structures that were developed during step 5 were used as a baseline for the follow-up interviews which were conducted with some of the initial participants, and these interviews also included participants who did not participate during initial consultations. For further consultations, information gather from previous steps was used to group actors according to their function(s) in the South African avocado value chain. For each group, two actors/firms were chosen for follow-up interviews. Those actors who did not participate during early consultations consist of individuals/firms that are not SAAGA members which included officials from large wholesales, exporters, value chain middlemen, and agents from National Fresh Produce Markets (NPFM) who are involved in the trading of avocados. SAAGA members identified these actors as playing a vital role in the South African avocado value chain. Due to Covid-19 lockdown regulations in South Africa, face-to-face interviews with the actors were not conducted. Instead, interviews were held using various modes of telecommunications, such as e-mail and Skype. Following an easing of the lockdown regulations, one farm visit was conducted for further observations and discussions.

Step 7: Design a finalized value chain map that accurately represents the value chain of the industry under consideration

According to Eckert & Latane (2014), evidence indicates that upgrading within a value chain can significantly impact developing countries. Improving chain relations and overall chain performance is expected to yield significant benefits in terms of economic performance and poverty reduction (Donovan *et al.*, 2015). This step involved combining all the knowledge and information obtained from previous steps and produce a map that accurately represents the industry analyzed. For this analysis, information obtained from literature analysis, key informants, comments received from the preliminary drafted maps, and from follow-up interviews with some of the actors who initially participated during the first consultations and SAAGA interviews were used to produce a final structure of the South African avocado value chain map. The structure which was eventually chosen was the one which had clear consensus from value chain participants and SAAGA officials.

In addition to the map structure, a questionnaire of unstructured questions was sent to all participants with an aim of identifying factors that are negatively affecting the functioning of this value chain which has resulted in the decline of the competitiveness of the South African avocado industry. Participants were asked to put forward factors affecting this value chain at specific parts of this value chain. This questionnaire, together with follow up interviews were also used to perform functional analysis of the actors found in the South African avocado value chain.

Step 8: Present the finalized map to a conference or workshop hosted by the industry to discuss the findings

Valuable feedback may result in adopting different methods, analysing additional results, or restructuring conclusions (Bressler *et al*., 2004). The objective of this step is to discuss the implications of the results while also opening up room for further refinement of the structure by industry experts. On the 16th of February 2022, the structure and the bottlenecks constraining the competitiveness of the South African avocado value chain was presented during SAAGA Research Symposium. This event consisted of South African avocado value chain members who are both SAAGA and non SAAGA members, researchers, government officials, private banks officials, export agents, National Fresh Producer Markets agents, international consumers, people who are interested in entering this industry and officials from the Cape Town port.

3.4 Results and Discussion

This analysis was able to produce a detailed value chain structure representing the South African avocado industry (Figure 3.3). The structure presented in this chapter were agreed upon by all members of SAAGA and those non-members who were present at the SAAGA Research Symposium which was held on the 16th of February 2022. The dotted lines on the far-left hand side represents a notion that the transformation steps of functions in the South African avocado industry starts with input supply to consumption. In between the transformation steps of function, there are significant transportation processes that take place. Important transportation processes are indicated with yellow boxes for road transport. Value chain actors are represented using grey boxes. The relationships between them are represented using highlighted arrows. Arrows going in the same direction but coming from different locations are represented using different colours. The dotted black arrows represent the shipment of avocados to consumers. Black boxes represent essential supporting services.

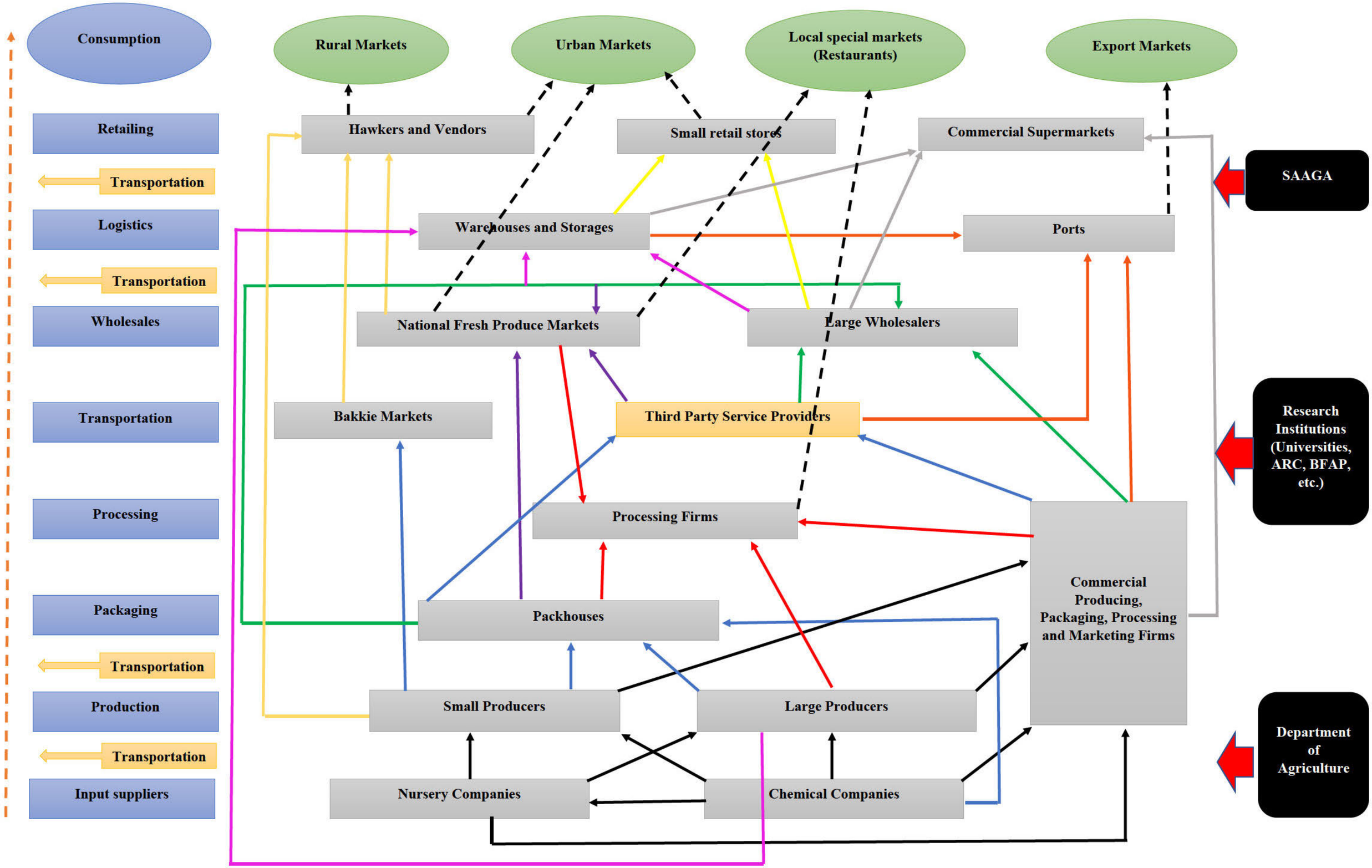

Figure 3.3: South African avocado value chain structure

The overall value chain structure in figure 3.3 was further divided into two simpler structures which represents the movement of avocados for local markets (Figure 3.4) and export markets (Figure 3.5) in South Africa. For the movement of avocados in the local markets, the value chain structure in figure 3.4 identified three major end markets for the South African avocado value chain and those markets are rural markets, urban markets, and local commercial markets. The end markets are used by the value chain participants to supply various qualities (different grades) of avocados at different prices. This structure also identified eight channels in which producers can supply their avocados to and those channels are privately owned packhouse, bakkie markets, processing firms, NFPM, large wholesalers, hawkers and vendors, small retail stores and supermarkets. Effective strategic development for improving performance and the competitiveness of this value chain can enable value chain participants to determine which channels to supply their avocados to, the type of grades required by specific markets, timing of supply and means of supplying. Even though this structure has revealed a number of channels which participants can use to supply this fruit locally, a number of participants revealed that this industry has not been able to realize the full potentials associated with the local markets.

For the movement of avocados to the export markets, the South African avocado industry mainly exports their avocados to the EU and UK which are regarded as the end markets for exports in the South African avocado value chain. The value chain structure for export value chain structure in figure 3.5 reveals that out of the three type of producers only two of them supply their avocados to the export markets. Avocados from South Africa are exported as fresh and also as processed. One of the major constraints of exporting avocados in South Africa are the inefficiencies which are associated with the functioning and management of ports according to this analysis.

Both structures, especially the structure for the movement of avocados for the local markets, have revealed that the avocados move through various channels until they reach the end consumers. This means a number of transportation and logistics is required to move the produce from one participant to another until the avocados reaches end markets. A robust logistic strategy can increase efficiency and help the supply chain survive in the long run (PLS, 2019). It was noted that most participants do not own most of the transport which moves the avocados in this value chain. Avocados are perishable produce which means they need to be handled with care until they reach the hands of the consumers. The transportation and logistics of perishable goods involves refrigerated units, the energy to run them and load integrity

requirements, which is why cold chain products typically are associated with higher transportation costs (Barcoding, 2017).

This analysis was able to identify the importance of social networks and the role these networks play in actor's functioning and competitiveness within this value chain. It was revealed that actors within this value chain build or establish relationships with other actors in the value chain for their benefit in performing better than their rivals, sharing ideas, movement of the product, and selling and buying the product. These relations vary amongst actors depending on their position in the value chain. The most common ties which were identified by this analysis are the combining of produce by different producers to meet the demand of the various markets, the sharing of information or ideas through study groups, provision of services amongst actors like packhouses and storage services, and the agreements of buying and selling of avocados between actors.

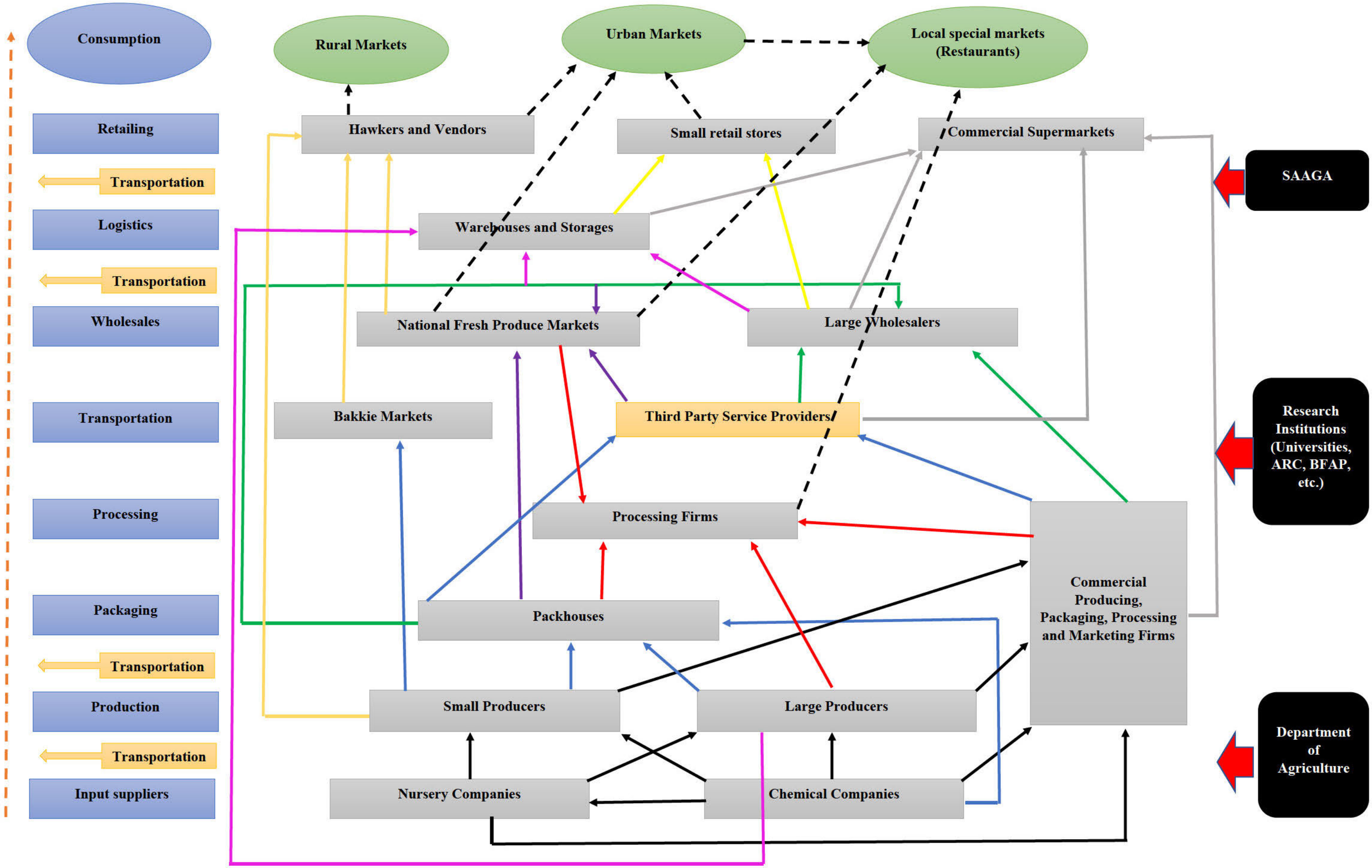

Figure 3.4: South African avocado value chain map for the local markets

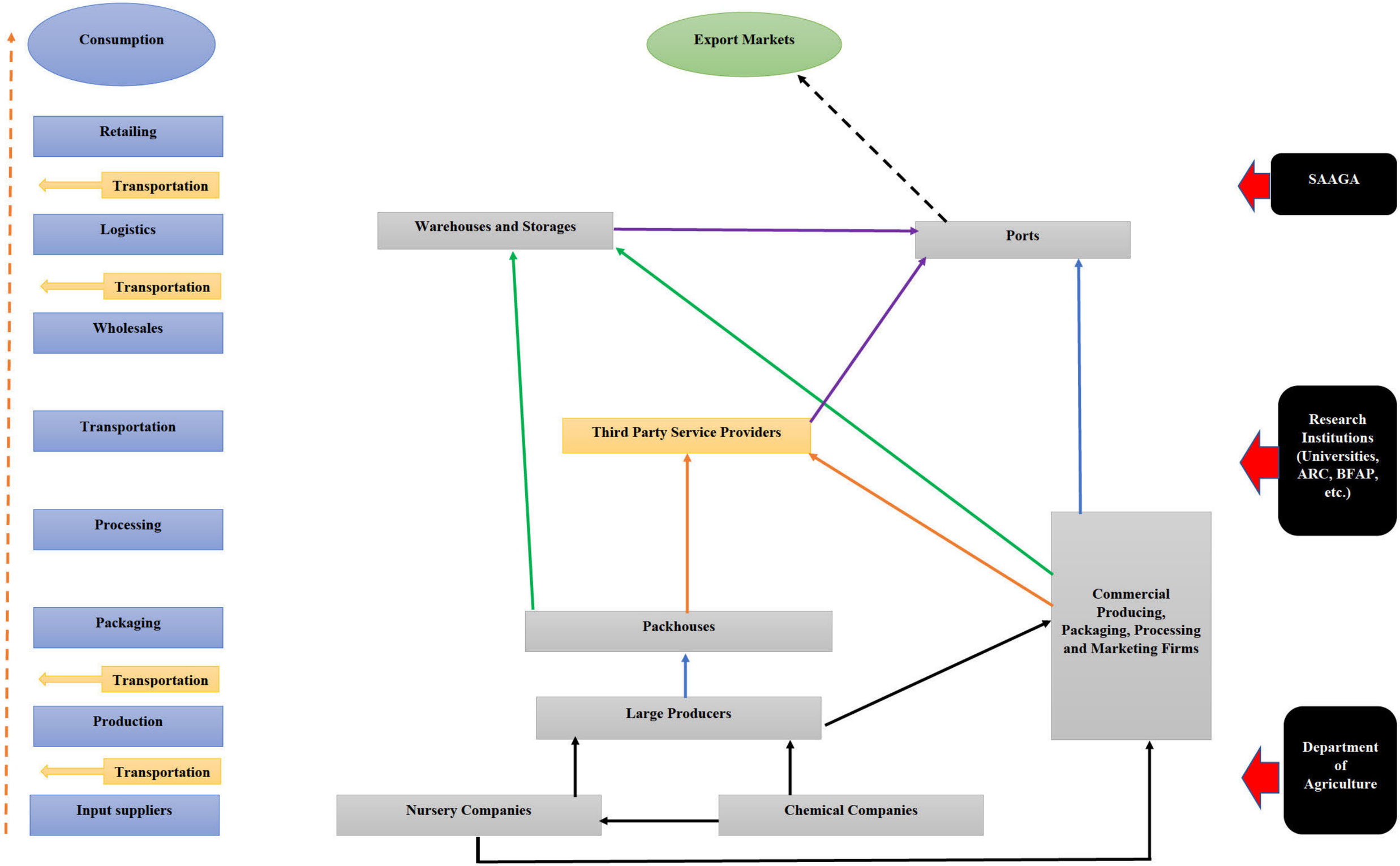

Figure 3.5: South African avocado value chain map for the export market

3.4.1 Functional analysis of South African avocado value chain actors and their role

This analysis revealed the following actors, which have been divided into main and supporting actors, as the actors involved in the South African avocado value chain. The study also revealed the major functions performed by these actors in moving avocados from raw material until it reaches the hands of the consumers. The principal target for value chain actors is to supply consumers with the best avocado quality. Therefore, the ability of the value chain actors to survive in this value chain lies in their ability to create strong, reliable, and trustworthy relationships (Social Networks) with various players in the avocado value chain, which will enable them to provide the best of goods and services. For main actors, their main focus is supplying high quality fruits to consumers, while supporting actor's main focus is to provide the main actors with the best services. These social networks resulted from the relationships, interactions, communication, and exchange of products or services between participants in this value chain.

3.4.1.1 Main actors

The main actors are generally directly involved with the product in this value chain.

- **Input suppliers**

Nursery companies and chemical companies were identified as the significant input suppliers for the value chain. Most of the large farmers and commercially producing farms develop and produces their own avocado trees. Also, in the value chain, as input suppliers, some companies specialize in supplying biological soils, plant health, and pest control solutions for producers.

Nurseries were identified as one of the key factors constraining the functioning and competitiveness of the South African avocado value. Some actors in the value chain, mainly producers, described nurseries as being unreliable and very expensive. The reasons stated by producers for identifying nurseries as a bottleneck included that they are often associated with delays when it comes to the development and supplying of young trees to producers. These delays result in producers losing a lot of money on land preparations. These delays result from developing avocado trees, which is a long and specialized process that can take up to two years. This process has many economic implications due to the number of losses that nurseries experience when developing these trees. All of this results in growers having to wait for up to five years after placing the first order for them. These delays not only affect the current avocado producers but also plays a huge role in preventing new entrance of producers in the South

African avocado industry. The nurseries have indicated that in order to deal with these delays, the industry will have to invest more on tree development research and advanced technologies which can be used to produce these trees at a faster rate.

- **Producers**

There are different categories of producers within the South African avocado industry which were identified by this analysis. Three categories of producers were identified in this study i.e., large producers, small producers and, commercially producing, packaging, processing, and marketing firms/producers. The category named "Small producers" encompasses those growers who supply the local market and have relatively smaller operations compared to large farmers. The other two categories "Commercially producing, processing, packaging, and marketing producers", and "large producers" are similar in many respects e.g., operation sizes and supplying to both the local and export markets, however, the "commercially producing, processing, packaging, and marketing firms" handle their own packaging, processing, and marketing whilst "large growers" do not.

"Commercially producing, processing, packaging, and marketing producers" are also responsible for growing and packaging avocados for the export, local, informal, and processing markets. In addition, commercially producing, packaging, processing, and marketing firms also perform the following additional functions in the value chain: technical support services to out-growers, nursery tree supply to out-growers, logistic facilitation, and value-adding (ripening). Major issues faced by these producers are export oriented issues such as those cause by high levels of competition in the export markets, lack of government support, administrations associated with the accreditations and lack of skilled labour.

Small producers are faced with the following challenges: lack of infrastructure on and off the farm, lack of mentorship and lack of access to information on availability and market requirements. This reduces their bargaining power and makes them more vulnerable to "exploitation" by middlemen, lack of mentorship, and use of and access to relevant technologies to optimize production. Large producers in the value chain are faced with the problems of insects and diseases, which affect their ability to supply to the international markets, high cost of production, and cost of nursery trees.

- **Packhouses**

Grading, packaging, cold store, and dispatch of avocados for the export, local, retail, processing, and informal marketing occur in packhouses. Packaging plays an essential role in ensuring safe and efficient transport of a product and confirming handling requirements, uniformity, recyclable material specifications, phytosanitary requirements, proper storage needs, and even attractiveness for marketing purposes (DAFF, 2018). This analysis revealed various ways avocado producers gain access to packhouses in the South African avocado value chain. These ways are, utilization of traditional packhouses, some producers, especially large one's own their packhouses which is only suitable for their product and the firms which have been classified as commercially producing, packaging, processing, and marketing firms also own their packaging facilities with an exception that these firms also provide packaging services for other avocado producers, and even to other fruit producers in some instances (e.g., kiwi producers). Many small producers and some large producers noted that even though the presence of the packhouse services provided by these firms plays an important role in the value chain, traditional packhouse is the most cost-effective between the two. The term traditional packhouse is a commonly used by the avocado industry to refer to a privately owned packhouse.

- **Processing firms**

The primary role of processing firms is to process, ripen, and pack avocados to retail, wholesale, and export markets. They are concerned with supplying both the local and export markets with processed avocado products. Most fruits used for processing are low-quality avocados fruit or damaged fruit due to poor harvesting, transportation, and handling techniques. Avocado oils and guacamole are the major end products of processed avocados in South Africa. Another service that processors offer for the local market is called 'Ripe N Ready' avocados. This involves selecting avocados and ripening them, which is done using temperature-controlled facilities, and the temperature is manipulated to control avocado ripening. This process helps provide the local consumers with the avocados that are ready to be consumed on the local retail shelves.

- **Wholesalers**

In the South African avocado value chain, wholesalers buy directly from farmers and/or packhouses in large quantities. Wholesaling differs from retailing because it specializes in

buying and selling in large amounts. Upon receiving the avocados, they repack them, and depending on their operations, they either brand the product with the name of their company or brand them with the name of a retailer they are supplying to. In addition, they are responsible for handling all the logistics processes when supplying the avocados from their facilities to supermarkets and retailers.

- **National Fresh Produce Market (NFPM)**

NFPM or as sometimes referred to as municipal markets are an integral, although diminishing, part of the price making, distribution, and marketing of fresh produce in South Africa (NAMC, 2017a). The major players sharing this fresh produce retail market can be classified into three broad levels: wholesalers, wholesaler-retailers, and retailers (Louw, 2008). These markets consist of different agents who handle avocados' selling for local and continental exporting on behalf of avocado producers in South Africa. Farmers approach agents based on the agent's experience, markets to which the agent has access to and the grades in which farmers produce. Agents negotiate prices on behalf of producers, and in return, they get a commission. Agents handle all the local and export selling, and most of the exporting of avocados taking place in the NFPM are sold to continental countries like Swaziland and Mozambique. In addition, agents are responsible for paying the rent of the building which is used for this market since most of the NFPM buildings in South Africa are owned by the state (Municipalities). The financial transitions are handled by the municipalities. The producers supply an agent with the avocados, the agent has up to five days to sell the produce. The money which the agent receives for the produce goes straight to the municipal account. Upon receiving the money, the municipality will give the agent its commission and the remaining will be given to the producer. Finally, when exporting, agents are responsible for handling all the logistics.

- **Hawkers and Vendors**

Many actors within the value chain noted that hawkers and vendors play a vital role in the South Africa avocado value chain. These actors buy their avocados directly from producers (both small and large), with a considerable proportion of their quantity coming from small producers. In addition, some hawkers and vendors sell avocados that they have produced themselves. Many actors within the value chain noted that hawkers and vendors play a vital role in the South Africa avocado value chain. Consequently, a significant number of avocado quantities are traded within the informal local market via hawkers and vendors.

- **Retailers**

These actors are responsible for distributing a large proportion of the total avocado produce to the local consumers within the South African avocado value chain. They acquire avocados directly from producers, NFPM, and/or wholesalers in the value chain through different channels. Once the product is in their possession, they are responsible for marketing the product to the consumers. Most retailers use social media, personal communication, and various promotions for marketing their avocados. Several avocado retailers indicated that for them to get their avocados to consumers effectively, they divide their operations into various departments that look at specific things. For example, three departments emerged as logistics, sales, and marketing. More importantly they have procurement departments as well, some that are specifically focused on getting the fresh produce that is required. Retailers form many relationships with various actors within the avocado value chain regarding what variety to supply, quantity to supply, and time to supply.

- **Consumers**

The South African avocado industry is export-orientated, but the local market plays a significant role, as shown by the maps in figures 3.3 and 3.4. There are three types of group of consumers for the South African avocado industry. The first one is the local market divided into rural, urban, and local commercial markets, consisting of restaurants, cosmetic companies, hotels, etc. The second one is the export markets dominated by the EU markets.

3.4.1.2 Supporting actors

These actors can be defined as people or companies that are not directly involved in the value chain, but they offer or provide services that help with the functioning of the value chain.

- **Marketing firms/agents/exporters**

Marketing firms/agents are responsible for managing the marketing channels of the product. Marketing channels are described as a pathway that a product passes through after its production until it reaches the hands of the consumers, during which processes like processing, storage, packaging, and labelling (Emeksiz *et al.*, 2005). Export agents will establish contacts between producer's/export organizations and buyers in the importing country and will usually take between 2-3% commission (DAFF, 2018). Many exporters from what was being called a 'logistical consolidation facilities' relationship with different actors in the avocado value chain ensure a smooth movement of the product from production until exportation. These

relationships consist of producers combining their produce for the market, warehouses, packhouses, storage, and transportation facilities. According to DAFF (2017), the core business of exporters is to market and sell the fruit of producers at the best price that they can negotiate. The publication further stated that for exporters to negotiate reasonable prices, they need to establish proper communication with the key players who are involved in the logistics chain and some of these players are cold stores, transporters, shipping lines, port terminals, clearing and forward agents, Perishable Products Export Control Board (PPECB), regional producers' associations and special market inspectors, etc.

- **Port**

For exporting, this industry mainly uses the Cape Town port. During the engagements and the consultations, and the interviews, the participants identified the Cape Town port as having the best resources for dealing with the avocado fruit. In South Africa, Cape Town is characterised by a large growing of horticultural produce like grapes, apples, oranges, etc. These fruits are then transported to other regions of the country. Avocado exporters take advantage of these transportation services to transport avocados to Cape Town port in backloading. Since the EU dominates the export market for the South African avocado value chain, Cape Town port is also used by exporters because every shipment in South Africa that is going to Europe must pass through the Cape Town port and if the exporter uses other ports (Durban and PE), they will have to add seven more days for fruit shelf life which could potentially affect the quality of the avocado fruit exported to Europe. Port was identified as one of the major factors affecting the functioning and competitiveness of this value chain. Some of the participants alleged that the cause of this is because ports are owned by the state as a result, “they are not properly managed”.

- **Fresh Producers Exporter's Forum (FPEF)**

This organization is responsible for handling the exporting of fruits in South Africa. Durring the engagements with the study participants who are avocado value chain members, FPEP was identified as one of the important supporting services, especially for exporter. The FPEF is a voluntary, non-profit organization with more than 130 members, accounting for about 90% of fresh produce exported from South Africa (FPEF, 2020). The organization's members consist of fresh produce exporters, producer-exporters, export, marketing agents, packhouses, logistics, and other service providers. This is a regulated body which ensures that all exporters of fruits in South Africa adhere to phytosanitary standards and other requirements which are

required by different export markets i.e., accreditations like GlobalGAP, the Sustainability Initiative of South Africa (SIZA) and British Retail Consortium (BRC) required by EU markets for South African avocado exporters. In addition to those accreditations, this association also conducts chemical tests to ensure that avocado producers did not use any chemicals which are not required by the international consumers and also to check that producers did not exceed Maximum Residue Limits (MRL) for permitted chemicals. This organisation also does quality checks on the produce itself which include moisture tests and observations or correct grades for the exports markets.

- **South African Avocado Growers' Association (SAAGA)**

SAAGA performs several functions that benefit avocado growers and other value chain actors. For example, it promotes research on mitigation of pests and diseases that affect avocado production. It also helps value chain actors, especially producers and exporters, improve their profitability and promote the viability of growing avocados in South Africa. They lobby government on behalf of their members on many issues like market access for export fruit, dispensation for fruit, PPECB matters, and fruit standards. SAAGA also arranges field days, study groups, and employing technical and extension staff. The association is responsible for conducting all kinds of research and providing funding for research projects focusing on issues affecting its members. SAAGA also collects marketing information which helps in decision making during picking and marketing programs. They also provide valuable production information and information concerning the value chain, which is very useful to growers and other actors in the value chain, and especially new entrants in the value chain.

- **Department of Agriculture, Forestry and Fisheries (DAFF)**

DAFF was identified as the main supporting service that is responsible for market access to international consumers. The role of government in every value chain is to ensure that all the participants in that value chain are protected. For example, the government must ensure that local producers are not affected in any way by competition from other producers from other countries, help local producers to access export market and protect the consumers from not paying higher prices for products. A competitive environment is created for both the local and export markets while ensuring consumer affordability and food safety. The government enforces export regulations and controls to ensure that exported and local fruits meet the required standards. The department negotiates with SAAGA on behalf of producers about

current export markets and access to new export markets. They also negotiate and enforce phytosanitary standards with the avocado trading partners for both exports and imports.

3.4.2 Factors constraining the competitiveness of the South African avocado value chain

After different consultations with the South African avocado value chain actors which all of them were members of SAAGA, they identified the following challenges or bottlenecks as major factors that have a negative effect on the functioning and competitiveness of the South African avocado value chain in comparison to their local and international competitors. Different type of actors such as producers, nurseries, and packhouses identified these challenges because of their experience and knowledge about the industry and their major local and international competitors.

Availability of nursery trees was identified by producers as a major bottleneck especially in terms of competitiveness. The delays which are associated with this factor make it very difficult for producers to expand their production at a significant rate and also to replace underperforming orchards.

Relatively lower yields than other competing origins around the world was identified as another major constraint for this value chain which is not only taking place at the farm level but affects the industry as a whole. This factor is as a result of alternative bearing, which is a big problem for many growers. These severe alternative bearings are as a result of failure by many producers to maintain a constant production rate has resulted in them producing lower yields.

Market access is the main issue because the South African avocado industry has one major export destination (the EU/UK) which has become a huge disadvantage for this industry since that destination has now become a playing field for other countries who has more than one export destination. One of the major constraints for the South African avocado industry in this export market is the overlap of the traditional window with large Peruvian volumes in this market.

Very little government support for the industry was identified by participants found in most parts of this value chain (input suppliers, producers, and exporters). The value chain actors revealed that in comparison to other countries especially the countries which are their major rivals in terms of producing and exporting avocados, the level of support they receive from the government is relatively low. According to participants, little research is done or supported by

the government, no subsidies are provided to the main actors in the value chain (i.e., producers) and failure by the government to assist in accessing new markets.

Expensive road transport is another major constraint for almost all actors found in the South African avocado value chain. Many participants indicated that it is very rare to find any actors owning their own transportation and this is because of the opportunity costs associated with such. Instead, actors hire transportation for moving avocados from one destination to another from a third party service provider. Participants revealed that major costs experienced in this value chain are those of transporting avocados from farm to port and from there to export destination. This is due to the fact that most production areas that are export oriented (Limpopo and Mpumalanga) are located very far from the main port (Cape Town) that is used for exporting avocados. Another factor which was put forward by participants that results in higher costs of transport are risks associated with the transportation and logistics process due to unforeseen delays. The container loading and shipping schedules, which if not done correctly, result in a negative impact on the quality of avocados which causes lower returns for actors.

Port inefficiencies which mainly affect exporters of avocados and participants revealed that this was due to poor port management which leads too many delays that results in many financial losses for exporters. During the period were the is a high number of citrus fruits being exported from South Africa, the avocado industry usually experiences a number of delays which negatively affect the quality of this fruit. Congestion at ports and delayed arrivals of the export fruit resulting in poor quality compared to the industry's major competitors. This poor quality often results in rejections in inspections conducted by FPEF.

Crime was identified by all the type of producers as one of the major constraints which is negatively affecting both the functioning and the overall competitiveness of the South African avocado value chain. This is because a significant proportion of avocados in the South African avocado is lost through criminal activities (theft). Such activities have all resulted in most farmers having to experience additional costs as result of having to introduce security majors in their farms.

These factors and their overall effect on the competitiveness of the South African avocado value chain with be further analysed in chapter 8.

3.5 Conclusion

This chapter was able to put forward a new, improved and a detailed structure of the South African avocado value chain, and this structure highlighted all the actors, activities, processes and the functions performed by the actors in this value chain. A structure of this nature can be used as a road map in trying to obtain different information (transparency) regarding the South African avocado industry. Unlike previous value chain mapping studies mainly conducted by Neves and various co-authors, this study was mostly concerned about producing a detailed value chain structure rather than doing both mapping and quantification. This also resulted in the researcher putting forward a systematic analytical framework which could be used to conduct value chain mapping analysis for producing a much-detailed structure of any productive value chain.

The value chain map produced in this chapter identified input suppliers, producers, processors, wholesalers, NFPM, hawkers and vendors, retailers, and consumers (both local and export) as the main actors involved in the South African avocado value chain while marketing firms/agents/exporters, the Department of Agriculture, port, FPEF, and SAAGA were identified as supporting actors. The actors were divided into these two groups because of their level of involvement in the value chain. The main actors are generally more directly involved with the product in this value chain, while supporting actors are not engaged with the product, but they provide services to main actors that help them with their respective roles. The value chain map which was produced in this analysis highlighted the general movements of avocados and the relationships between the avocado value chain actors in South Africa. The value chain identified three types of producers that are found in the South African avocado value chain. Producers were revealed as those players who have the most interactions with other players in this value chain.

The analysis also identified a number of challenges and/or bottlenecks that avocado value chain actors perceived as constraining both in terms of the functioning and the competitiveness of this value chain in relation with their local and global rivals. Out of all challenges that were identified by the actors, availability and supplying of avocado trees, the industry having only one major export destination, market access to other global regions, port inefficiencies which are a result of the industry using one major port which is also highly used by other industries, transportation and logistics risk and costs, and distances from production regions to port and from port to export markets emerged as being the most constraining.

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Finally, the eight-step analytical framework that was put forward by this study was able to create a more detailed structure of the South African avocado value chain highlighting all the important actors, processes and the transformation steps of functions as it was intended. Unlike previous value chain mapping studies which were concerned about mapping and quantifying the value chain at the same time which resulted in them developing simpler structures of those value chains. This analytical framework that was put forward by this study is only concerned with a detailed structure.

CHAPTER 4: SOCIAL NETWORK ANALYSIS: A CASE STUDY OF WATERFORD FARM

Abstract

The purpose of this chapter is to use a case study involving a commercially producing, packaging, processing, and marketing avocado firm (Waterford Farm) in order to identify the operations of this actor and the activities associated with those operations. This is done to identify and analyse all the relationships this firm has with other players who are within or outside the South African avocado value chain in order to understand how these relationships influence the functioning and the competitiveness of this actor in the South African avocado value chain. To achieve this, the egocentric approach was used to identify the alters (entities) and their relations with an ego (actor analysed). The results were further analysed using UCINET software. Trust, reliability, and service requirement levels were identified as some of the significant characteristics that enable a positive business relationship between this producer and entities which the producer interact with. In return, this has a positive influence on the overall functioning and the competitiveness of this producer. In contrast, the business locations of most of the entities was identified as a major constraint for these relations. This chapter was able to apply the concept of Social Network Analysis on this type of value chain actor with an aim of analysing how value chain relations and linkages influence performance of this actor. Such analysis has open up new possibilities when it comes to understanding the relationships and linkages of all the value chain actors for a more effective value chain strategic development.

Keywords: Actors, Avocado, Competitiveness, Social Network Analysis, Value Chain

4.1 Introduction

Social network analysis (SNA) is an interdisciplinary research methodology that deals with the prediction of the structure of the relationships among social entities and the impact of these relationships on social phenomena (Butts, 2008). Springer & de Sterguer (2011) defined SNA as a tool used to model, visualize, and analyse the interactions between individuals within a group and organization. The main goal of SNA is to detect and interpret patterns of social relations among entities (Guillemois, 2013). A social network consists of different types of entities (persons, groups, organizations, texts, and concepts). Within a network, there are relations, and these relations are defined as pairs of entities (Knoke & Yang, 2008). Moreover, they exist in a wide range, including attribution of trust or friendships, interpersonal communication, and binary entailments (Butts, 2008). The core concern of the social network paradigm is to understand how social structures facilitate and constrain opportunities, behaviours, and cognitions (Carrasco *et al.*, 2008).

According to Springer & de Sterguer (2011), SNA has been used in various disciplines such as sociology, business management, and public health to analyse and understand relations for several groups and organizations. These authors further explained that this methodology is underused in agriculture and natural resource application despite many uses by other fields. The method of SNA has not been used in South African agricultural, agribusiness sector, and agricultural value chain studies to analyse the importance of relations that exist between several groups and organizations. Furthermore, there are no published studies looking at the social networks between the different types of producers in the South African avocado value chain and how these relationships between producers and other actors in the value chain, and between these different producers themselves influence the functioning and the competitiveness of actors in this value chain.

A value chain is a network of companies (Carter *et al.*, 2015) which can consist of legal and natural persona. It comprises of interconnected participants such as sub-suppliers, suppliers, manufacturers, logistic service providers, and consumers (Borgatti & Li, 2009). Understanding and calculating network-related data is of particular interest for research on value chain since a value chain is a network (Guillemois, 2013). A value chain mapping analysis conducted on chapter 3 revealed the importance of the relationships between avocado value chain actors (especially producers) and how these relationships influences the functioning and performance of actors in this value chain. As a result of that analysis, it was also noted that as part of analysing the overall competitiveness of the South African avocado industry, the researcher

would need to analyse the relations that value chain actors have with other actors with an aim of trying to understand how can this information about the nature of the value chain relations be used to develop strategic actions based on the nature of these relations.

South African avocado producers are central to the value chain map of the industry presented in the previous chapter (Figure 3.3) and have many relationships with other actors within and outside the South African avocado value chain. These relationships enable producers to perform a number of functions which includes consistency when they are supplying avocados to their markets, helps them with accessing of important information about the industry or markets, create competitive advantage, create unique cold chains, and help with economies of size, which is advantageous for the export market etc. For this reason, a commercially producing, packaging, processing and marketing avocado producer was selected to be the subject of the case study for the Social Network Analysis.

The value chain mapping analysis identified three types of producers within the South African avocado value chain. These producers were "small-scale producers", "large producers", and "commercially producing, packaging, processing, and marketing firms". Early consultations with avocado producers who fall under these three types revealed that most producers (90%) in the country are members of the South African Avocado Growers' Association (SAAGA). Commercially producing, packaging, processing, and marketing firms were identified as industry leaders who play a crucial role in the South African avocado value chain and all the other different types of producers look up to them. The other type of producers (small and large) revealed that their end goal is to be like this type of producer. The relationships between these three types of producers are established to help each other expand their operations through information sharing. SAAGA also promotes these relationships as part of its objective to transform the industry.

Based on the reasons provided above, as part of analysing the South African avocado value chain's competitiveness, a study that looks at the operations and the relations that are involved in one of the commercially producing, packaging, processing, and marketing firms would be conducted. This study will contribute to the knowledge gap by providing detailed knowledge about the operations of this type of producer, relations that exist within the operations of this type of producer, how these relations are established and how they are maintained, and moreover, how such relations influence the performance and the competitiveness of this type producer.

The information when it comes to what makes the operations of this commercially producing, packaging, processing, and marketing firm (Waterford Farm) unique and advantageous to their overall performance and competitiveness in this value chain, the type of relations they have with other players, etc., can be used by the other producers who fall under large and small producers in the South African avocado value chain to improve their performance and competitiveness in this value chain. This information can also be used to identify certain weaknesses and strengths which are associated with particular relations, which might include the behaviours (i.e., opportunistic behaviours) of certain actors, and the areas of collaborations between different value chain actors. Furthermore, such information can be used by this producer (Waterford Farm) for a more effective strategic development aiming at improving the competitiveness of this producer.

The main objectives of the analysis presented in this chapter are to:

- *Conduct a case study involving the operations (from production planning to consumers) of one of the commercially producing, packaging, processing, and marketing firms in the South African avocado value chain.*
- *Identify social networks for the chosen type of avocado producer with other actors.*
- *Identify how these interactions influence their functioning and their competitiveness in the value chain.*
- *Recommend how such information can be used on a firm and industry level for effective strategic development.*

The next section provides an overview of the peer-reviewed literature on Social Network Analysis, its uses and various techniques. Section 4.3 provides an overview of the methodology to be used in this chapter. The concept of Social Network Analysis is used to analyse and measure the relationships and linkages involving Waterford Farm in the South African avocado value chain and the results are presented in section 4.4. Conclusions are drawn in section 4.5.

4.2 Theoretical framework on Social Network analysis, its uses and various techniques

In the context of a developing country, where agriculture constitutes an important livelihood strategy, informal networks often contribute to effective land management because in times of rapid change, such networks can enable innovation and enhance flexibility, which may be hindered by bureaucracy associated with government programs or other agricultural outreach programs (Folke *et al.*, 2005). According to Cadger *et al.* (2016), recent studies have

demonstrated that social ties play an important role in agricultural knowledge exchange resulting in more effective and sustainable farming practices, particularly in developing countries agriculture. Formal and informal networks and interactions have been highlighted as key variables in the adoption and success of community-based agricultural resource management (Nyantakyi-Frimpoy *et al.*, 2019). These authors further stated that understanding and optimizing these networks within established and active cooperatives would undoubtedly reinforce the goals of cooperative action and stimulate successful outcomes in the face of environmental and social changes. This sub-section aims to review past SNA studies to understand better this technique, how this technique has been used in agricultural or value chain studies and identify an approach to use in order to achieve the aim of this chapter.

According to Borgatti & Foster (2003), theoretical studies on social networks have significantly impacted various domains such as social capital, knowledge management, network organizations, etc. Moreover, an enormous variety of relations occur among individuals and collective social factors relevant to representing network structures and explaining their effects (Knoke & Yang, 2008). Recent advancements in computer hardware and software combined with theoretical constructs of sociology and mathematical foundations of graphs make SNA unique for visualising and investigating social structures and relations (Wasserman & Faust, 1994).

There are two different traditions for SNA, which were developed in the late 1930s (Scott, 2000). The first was the work done by a group of researchers at Harvard University to find subgroups of people in larger groups. The *Sociocentric approach* developed from this tradition. It involves the quantification of relationships between people within a defined group. The focus is on measuring the structural patterns of those interactions and how those patterns explain outcomes. The second tradition originated from a group of anthropologists at the University of Manchester which paved the way for community studies and gave rise to the *Egocentric approach*. They studied the networks of relations surrounding individuals rather than focusing on the whole society. Therefore, with its focus on individuals, it was concerned with generalizing about personal networks (Chung *et al.*, 2005).

Since there are many specific types of relations that a researcher can measure, the type that the researcher would choose will be a subject to the project's objectives (Knoke & Yang, 2008). These authors further explained by giving an example of relations that exist among collectivises in a corporation, those relationships include exchange goods and services, communicate,

compete, sue, lobby, and collaborate. When it comes to SNA, researchers would have the time and resource to collect data and every possible kind of relationship for every person within a given network but however this is not possible due to resource limitations both in the ability of most researchers to collect such an exhaustive amount of data and in the ability of the respondents to enumerate social contacts to that event (Shakya *et al.*, 2017).

Name generators and name interpreters are used to bring forward the entities and the connections between them. Using the method of name generators has its drawbacks, but in most cases, this method is generally reliable and is more efficient than other methods (Bien *et al.*, 1991; Shakya *et al.*, 2017). Many methodological issues surrounding the use of name generators have been uncovered by many studies (Eagle & Proeschold-Bell, 2015). According to Pustejovsky & Spillare (2009), respondents might experience survey fatigue and begin to underreport increasingly alters with each additional name generator question.

According to Ferligoj & Hlebec (1999), how a question is asked is essential in eliciting network ties. The most crucial component is the content of the question itself. Shayka *et al.* (2017) further stated that the relationships elicited by the name generators create the network structure, and the specific questions asked to elicit those ties provide the context. "Name generator questions, therefore, usually focus on the specific context of relationships. The context of the question determines the type of relationship depicted, which is a crucial component of understanding the significance of the network itself" (Shayka *et al.*, 2017; Page 158). According to Van de Poel (1993), network context can be categorized as exchange (people with whom an ego engages in reciprocal service provision such as borrowing and lending money); role relation (specific relationships such as spouse or mother); interactive (people with whom an ego interacts with during the day) and effective (people with whom an ego shares strong emotional bonds).

Since its beginning, sociologists have explored the best means for measuring social networks (Shayka *et al.*, 2017). In any empirical network research, investigators must initially attend to three crucial issues before collecting data: boundary specification, network sampling, and measurement relations (Knoke & Yang, 2008). A study by Nyankakyi-Frimpong *et al.* (2019) aimed to identify information network structures within cooperatives and what these structures meant for resource-conserving agriculture found that farmers with more biomass accumulation from the adoption of agroforest practices tend to be popular advisors to their peers at the local level. The study also found that farmers seek peers who demonstrate clear signs of achieving

land management goals. All information was achieved using a simple SNA technique to identify and understand these relations.

Agricultural firms get into partnerships with other firms to move products from farms to consumers, resulting in a series of connections called a value chain. Studies have shown that firms get into partnerships with other firms based on a number of advantageous qualities which those firms possess which could benefit their operations. All this results in different relations amongst these firms. Studies have identified trust as the core foundation and factor in maintaining these relations within a social network.

Based on the literature review, when it comes to SNA studies, the researcher(s) needs to set boundaries for the network, choose a representative sample, and based on these two factors, and the researcher needs to further choose a correct technique to measure the nature of the relations. There are various ways of measuring links and different softwares which can be used to represent relations. The type chosen is subject to the study's objectives and experience of the researcher. For example, name generators and name interpreters are common techniques used by researchers to identify entities and relations between firms, and this will be used in this study.

4.3 Methods and Materials

Central to social network analysis's theoretical and methodological agenda is identifying, measuring, and testing hypotheses about the structural forms and substantive contents of relations among actors (Knoke & Yang, 2008). The use of SNA method depends on the availability of relational rather than attribute data (Scott, 2000). According to Knoke & Yang (2008), SNA consists of three elements that needs to be considered during network design to shape the measurement and analysis strategies available to researchers. Those elements are: *sampling units, rational form and content, and level of data analysis*. Every network project must make explicit decisions about each element before beginning fieldwork.

When conducting a study using the SNA methodology, it is essential to build on the existing body of theory and empirical results before striking out on your own, even if you are working in an area where network analysis is just starting to catch on (Denny, 2014). According to Carrasco *et al.* (2008), some of the key challenges faced by researchers when collecting social network analysis data includes the difficulties of defining network boundaries as people do not easily recall their network members, and need appropriate 'prompts' to elicit them, in addition, networks are very large in general and different social network members may have different

importance, depending on the phenomenon studied, and information about the network members needs to balance details and interviewee's burden. Therefore, after going through past studies and looking at the objectives of this analysis, the following steps were derived from various SNA techniques, and they will be followed to conduct the SNA on one of the types of avocado producers in the South African avocado value chain.

Step 1: Perform a case study on a producer that is reasonably representative of producers found in the South African avocado value chain

Waterford Farm is one of The Fruit Farm Group (TFFG) South African farms and can be found in Richmond region, KwaZulu-Natal. TFFG was created in 2014 with their diverse product portfolio, their operations are geographically spread in four countries over three continents. Waterford Farm, which is classified as a commercially producing, packaging, processing, and marketing firm, will be used as a case study for this analysis.

Since the South African avocado industry is export oriented, the industry is made of a relatively large percentage of commercially producing, packaging, processing, and marketing firms. These producers then offer services to the other type of producers (large and small producers). These services include mentorship, technical advisory services, packing services, processing facilities and marketing (Currie, 2021). When it comes to the South African avocado industry, all commercially producing, packaging, processing, and marketing firm share mostly same relations and same production plans which they share through SAAGA.

For this case study, a commercially producing, packaging, processing, and marketing firm was chosen since they are regarded as industry leaders when it comes to the type of producers found in the South African avocado value chain. This analysis aims to use this farm to identify the operations of this type of producer that are involved in the production and the supplying of avocados to various markets. By identifying the operations, the researcher wanted to further identify the entities within these operations and analyse the relations between them and this producer, and identify how these relations influence the functioning and the competitiveness of this producer.

Step 2: Identify the networks

SNA allows the examination of how networks' configuration influences how individuals and groups, organisations, or systems function (Freeman, 1996). The network for this study will be

seeking to identify all the producer's relations and their influence on the farm's functioning and competitive advantage. This will be achieved through answering these questions:

- *How many relations the producer has with other actors in the value chain?*
- *How important are those relations to the functioning and competitiveness of the farm?*
- *How often do producers interact with the actors they have relations with?*
- *How often do these actors interact with each other?*

Step 3: Data Collection

Name generators and name interpreters (Appendix B) were used to collect the data for this analysis. These are two survey instruments used by most researchers to collect egocentric data. According to Marsden (2005), name generators identify each respondent's alters and name interpreters obtain information on each alter and the relations among them and with ego. Name generators are used to elicit network members. They involve free recall questions that elicit alters from an ego's network. Name interpreters are used to obtain more information about the characteristics of each alter (e.g., socioeconomic status, relationship with ego and ego-alter relationship (e.g., frequency and characterises of interaction)) (Carrasco *et al.*, 2008). A questionnaire that had structured and non-structured questions was used to elicit name generators and name interpreters for the avocado producer analysed in this chapter. Additional interviews with the farm manager, production manager, supervisor, permanent staff, farm observations, and old documentation analysis was used to collect additional data for this analysis.

Step 4: Data Analysis

The level of data analysis that was used in this study was an *egocentric* level of analysis. *Egocentric network* studies focus on specific actors or egos and those who have relations with them, called alters (Carrasco *et al.*, 2008). These authors further stated that egocentric network data are comprised of two levels: (i) an ego-network level constituted by the ego's characteristics and overall network features; and (ii) an ego-alter level, constituted by the characteristics of each alter and alter-ego ties. For this study, the egocentric level of analysis was chosen because the focus in to analyse all the relations which are associated with an individual actor/firm. Data was analysed using the **UCINET** software to create a virtual representation of the relations and the interactions the producers has with other actors.

Since the objective of this study is to identify and analyse all the relationships this firm has with other players who are within or outside the South African avocado value chain in order to understand how these relationships influence the functioning and the competitiveness of this actor in the South African avocado value chain, a number of factors will be analysed with an aiming of achieving the objective of this study. Factors which influences the competitiveness and the functioning of actors will be gathered from business literature, through engagements with business experts and agribusiness managers.

4.4 Results and Discussion

4.4.1 Farm operations and functioning

The farm is approximately 146 ha with 116 ha under avocado production. 80% of the avocado orchards are Hass, while 20% consist of Pinkerton and Fuerte. The farm exports more than 60% of its total production. The farm is in the most southerly avocado producing area. Because of the region is also cooler as well, their fruit can stay on the trees longer and they can harvest up until December. The farm has 16 permanent skilled workers and during harvest time it hires in 30 to 40 casual labourers from the local region.

Seven main functions which form part of this farm were identified and included in the analysis (Figure 4.1). These operations start from planning for new orchards, establishment of new orchards, management of non-productive (young) and productive trees, harvesting, packaging, and marketing of avocados. Figure 4.2 displays all the activities within the farm operations. As indicated in the previous chapter, the role played by SAAGA regarding information, technical assistance, market access, and information was acknowledged by the farm manager, and who further noted that it plays a significant role in the operations of this farm. Young trees management and productive trees management are not mutually exclusive on the Waterford farm. This is because the farm has been operating for many years, so the establishment of a new block does not affect the operations of the existing blocks, this is managed at the same time.

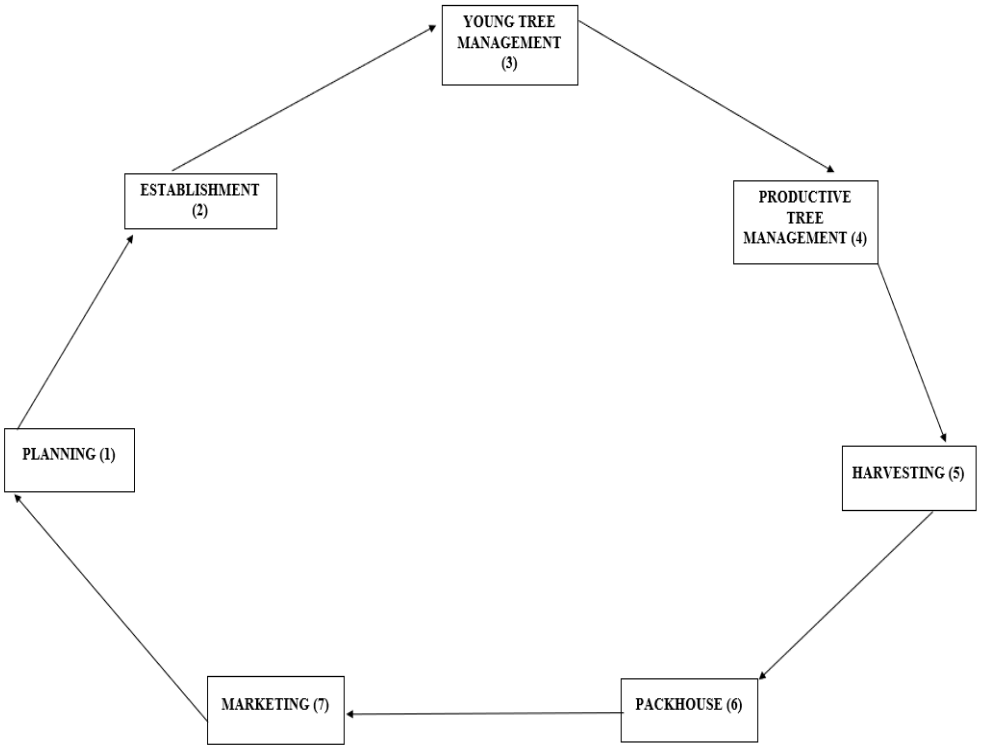

Figure 4.1: Waterford farm operations diagram

Source: Own processing

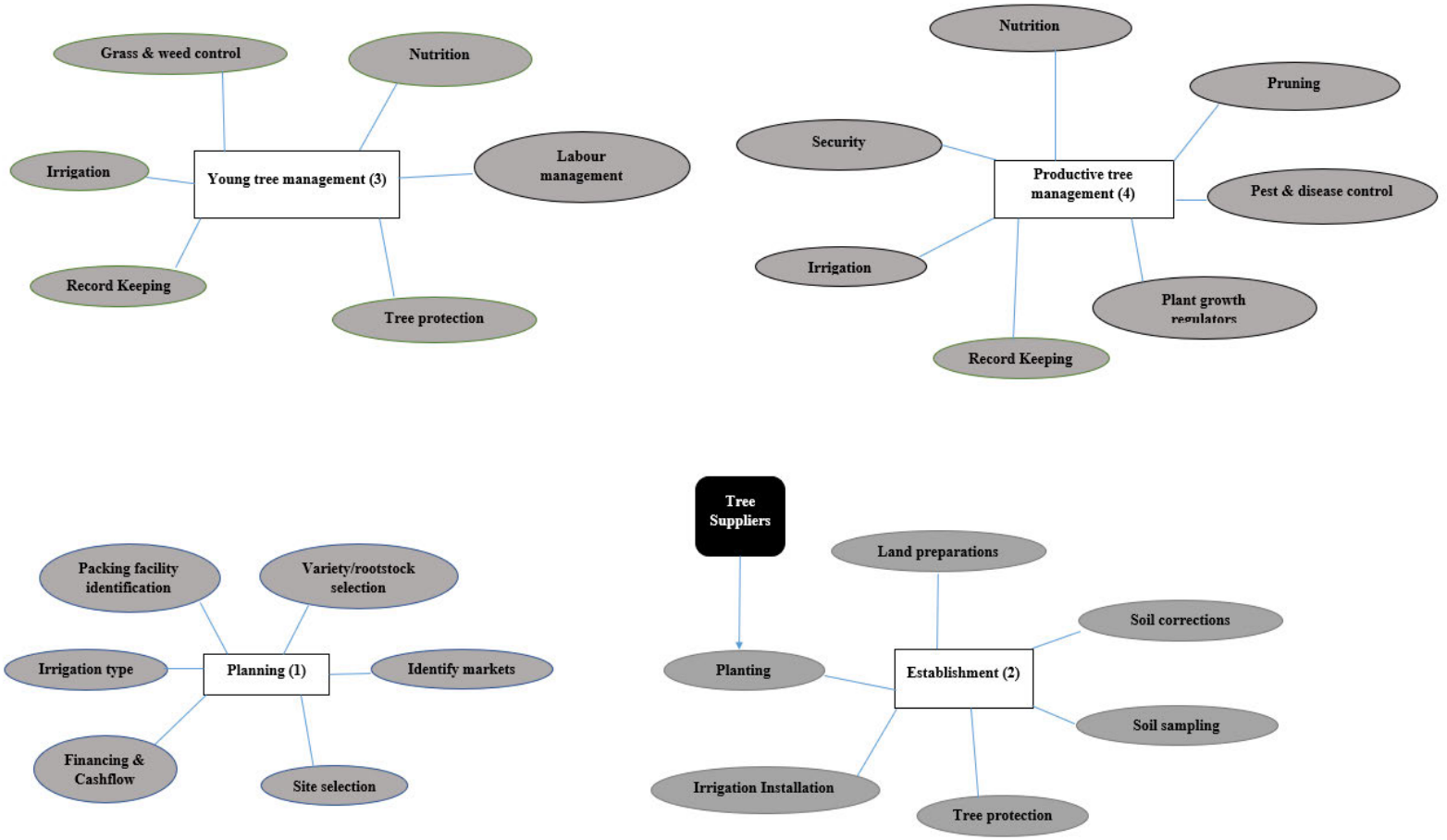

Figure 4.2: Activities that take place within Waterford Farm operations

Source: Own processing

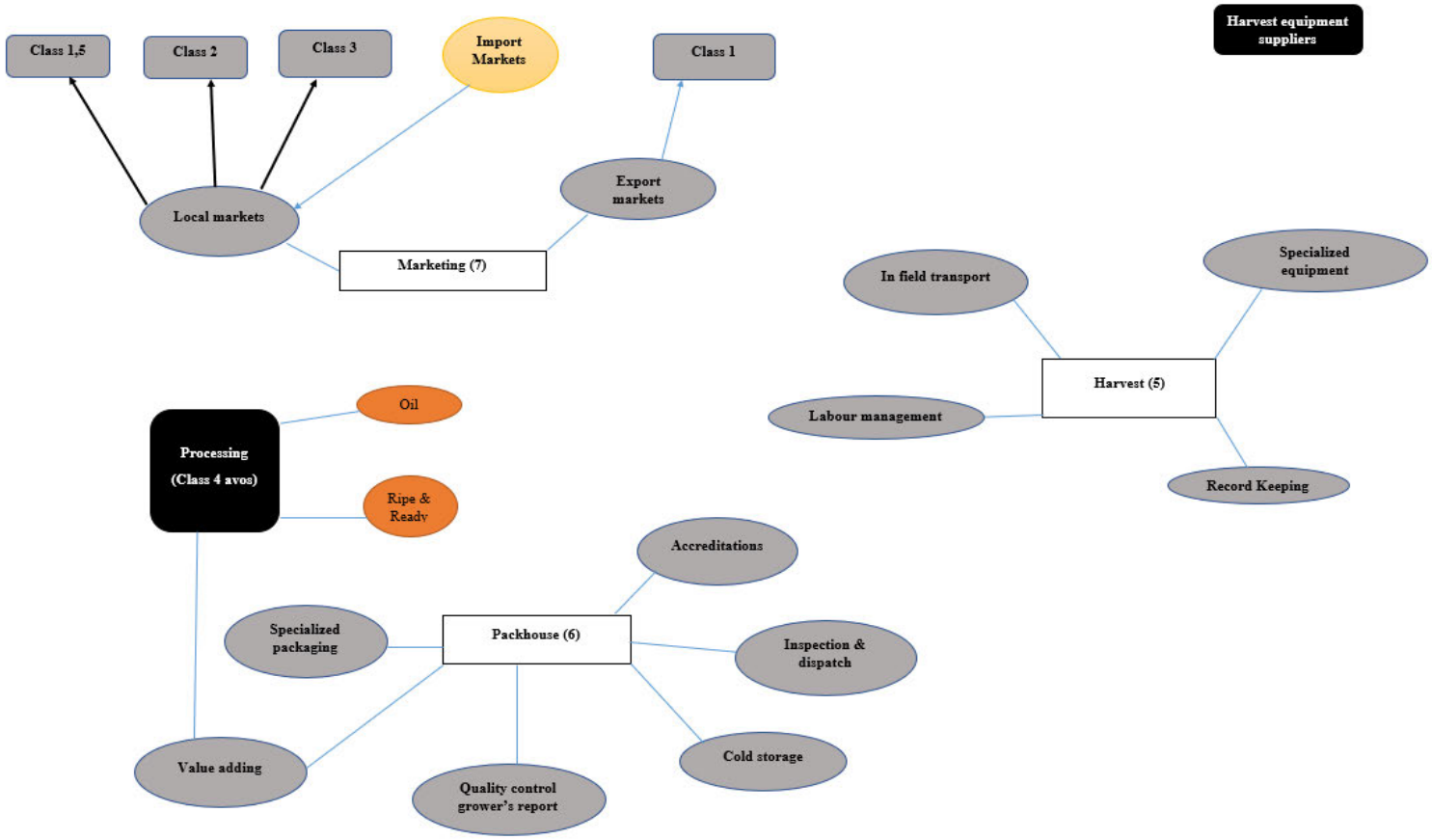

Figure 4.2: Activities that take place in Waterford farm operations (Continued)

- **Planning**

During this stage, the management and marketing teams make a number of decisions regarding the site, size of the block(s), irrigation type and layout, variety to be grown and all the technical aspects associated with it. The marketing team also identifies potential markets for these avocados to be planted. The farm communicates with the packhouse on whether the packhouse facilities can deal with the packaging and storage of these new avocados from the planned establishment. Finally, during this period, the farm management team also determines the financial feasibility and cash flows for the duration of these trees being non-productive.

- **Establishment**

The farm is constantly establishing new blocks of avocado orchards and removing old unproductive ones. Every action implemented during this phase is subject to what has been planned. New trees are received from nurseries that are accredited by the Avocado Nurserymen's Association (ANA). This association manages the avocado plant improvement scheme, together with SAAGA, and it aims to improve the productivity of the avocado industry by ensuring that avocado nursery trees are of the best possible quality and are produced by accredited SAAGA nurseries (SAAGA, 2016). The success experienced by Waterford farm when it comes to their establishment of new blocks is influenced by correct soil sampling which is done through an accredited laboratory, soil correction which is a process of applying certain fertilizers and chemicals to the soil to improve soil quality, land preparation which is done with a help of a contractor and the use of different materials to protect the planted trees as shown in figure 4.3. Figure 4.3 highlight the amount of relations which goes in place during establishment this include the farm having a number of relations with different actors which help with the maintenance of a recently established orchards. Those relations include tree supplier, nets supplier, pegs (wood) supplier, mulch supplier and input (nutrient) supplier. All these are there to ensure that these trees survive during the early stages of establishment.

Figure 4.3: Materials used to protect the newly planted avocado trees at Waterford Farm
Source: Capture at Waterford Farm (2021)

- **Young trees management**

This phase is where avocado trees are not yet productive, and the farm is not making any returns from them. The farm uses micro-sprinkler irrigation to irrigate these trees. Regular control of grasses and weeds and pests and diseases is performed by permanent and temporal labor. Fertilizers are applied once every two weeks during spring and summer.

- **Productive trees management**

Plant growth regulators are applied to manipulate tree growth and the yield on the avocado trees at Waterford farm. In addition, there is regular scouting (once a week) for pests and diseases on the farm to keep track of the number of pests and diseases in the orchards and the damage they cause so that proper action can be taken to prevent them from causing economic damage on the fruit. Since the orchards at this stage produce fruits that earn an income, they become subject to criminal activities such as theft, and as a result, security has to be put in place.

- **Harvesting**

During this period, additional temporal labour is introduced to perform this function, and that labour is trained. Specialized equipment, which is bought from a supplier who specializes in making of different harvesting equipment which are harvesting clippers, bags, containers and

long clippers. Before harvesting of avocados begins, the equipment is often taken to the supplier for maintenance. Tractors are used on the farm for other duties as well as site transportation of avocados. Transport services responsible for moving avocados from the farm to the packhouse are hired from a contractor.

- **Packhouse**

On arrival at the packhouse, the avocados are washed to prevent any unwanted field dirt or pests from entering the facilities. The packhouse is accredited by the British Retail Consortium (BRC) and Sustainability Initiative of South Africa (SIZA). The BRC food safety standards can be used by any food processing operation where open food is handled, processed, or packed (Farmsoft, 2021). One of the main objectives of this standard is to try and protect the consumer by proposing an evaluation basis for enterprises that supply packaging material for food products to retailers (Ducajo, 2021). In addition, BRC food standards help packhouses establish good manufacturing practices to produce safe, legal products that meet the quality levels expected by customers (Farmsoft, 2021). SIZA enables South African agriculture to be a global leader in ensuring sustainable, ethical trade and environment stewardship (SIZA, 2021). According to Citrus Resource Warehouse (2016), SIZA audits were originally developed for South African fruit farms and packhouses to promote sound and ethical labour practices.

At the packhouse, the avocado fruits are kept in a cold storage to maintain their quality until they reach the hands of the consumers. Packaging of avocados for various markets in which different qualities are packed at the packhouse in the main function performed by the packhouse. Specialized packaging for local retailers also takes place here. Low-quality avocados are processed into avocado oil.

- **Marketing**

Fruit of different qualities are sold to markets where they are demanded. Fruits produced on this farm are exported, sold to NFPM, local retailers, other avocado producers, and informal markets. It is the duties of the marketing team to determine the right channels at the right time in which the avocado will be sold at a good price.

The operations on this farm indicate that this farm has various relationships with different people/companies, which positively influence the operations of this farm. Therefore, the kind and type of relationships that this farm has with other people/companies will be the focus of

this SNA with the aim of analysing how such relationships influences the performance and the competitiveness of this producer.

4.4.2 Social Network Analysis of Waterford Farm

The opportunity to bring together different entities can create innovations and new competitive advantages (Kohnova & Papula, 2019). This analysis revealed that this farm has 337 ties with 26 different entities involved in all seven operations of this farm. The results of this analysis were further analysed using **UCINET** software to produce a virtual representation which is shown in figure 4.4. The 26 entities which are involved in the operations of Waterford Farm are listed below:

WFR= Waterford Farm Relation

WFR 1- Researchers

WFR 2- Engineers

WFR 3- Financial Institutes

WFR 4- Packhouse Manager

WFR 5- SAAGA

WFR 6- Accredited Lab

WFR 7- Contractors (Land Preparation)

WFR 8- Agricultural Engineer

WFR 9- Chemical Companies

WFR 10- Service providers for tree protection materials

WFR 11- Fertilizer companies

WFR 12- Security Company

WFR 13- Contractor for pruning equipment

WFR 14- Plant growth regulator company

WFR 15- Pest and disease chemical company

WFR 16- Harvesting equipment supplier

WFR 17- Specialized packaging material

WFR 18- Cold storage contractor

WFR 19- PPECB

WFR 20- Accreditation agent

WFR 21- Off filed transport contractor

WFR 22- Export markets

WFR 23- Local retailers

WFR 24- Local producers/Out growers

WFR 25- Government

WFR 26- Import markets

The planning phase, productive trees management, and the packhouse were identified as the operations having the most ties, which was equal to 65 each (Figure 4.5, 4.6, 4.7). This is because the success and the daily running of this farm is subject to good productive trees management. Many efforts are put in place by the farmer to ensure the success of productive trees management (Figure 4.6), hence it emerged as having many ties with various entities. How productive trees are managed plays also vital role in both the quality and quantity of avocados produced at Waterford Farm. Also, the planning phase (Figure 4.5) takes places in most of the activities which takes place on this farm which also result in it having many ties as well. The packhouse (Figure 4.7) also has many ties because it provides many services for the farm and other external entities.

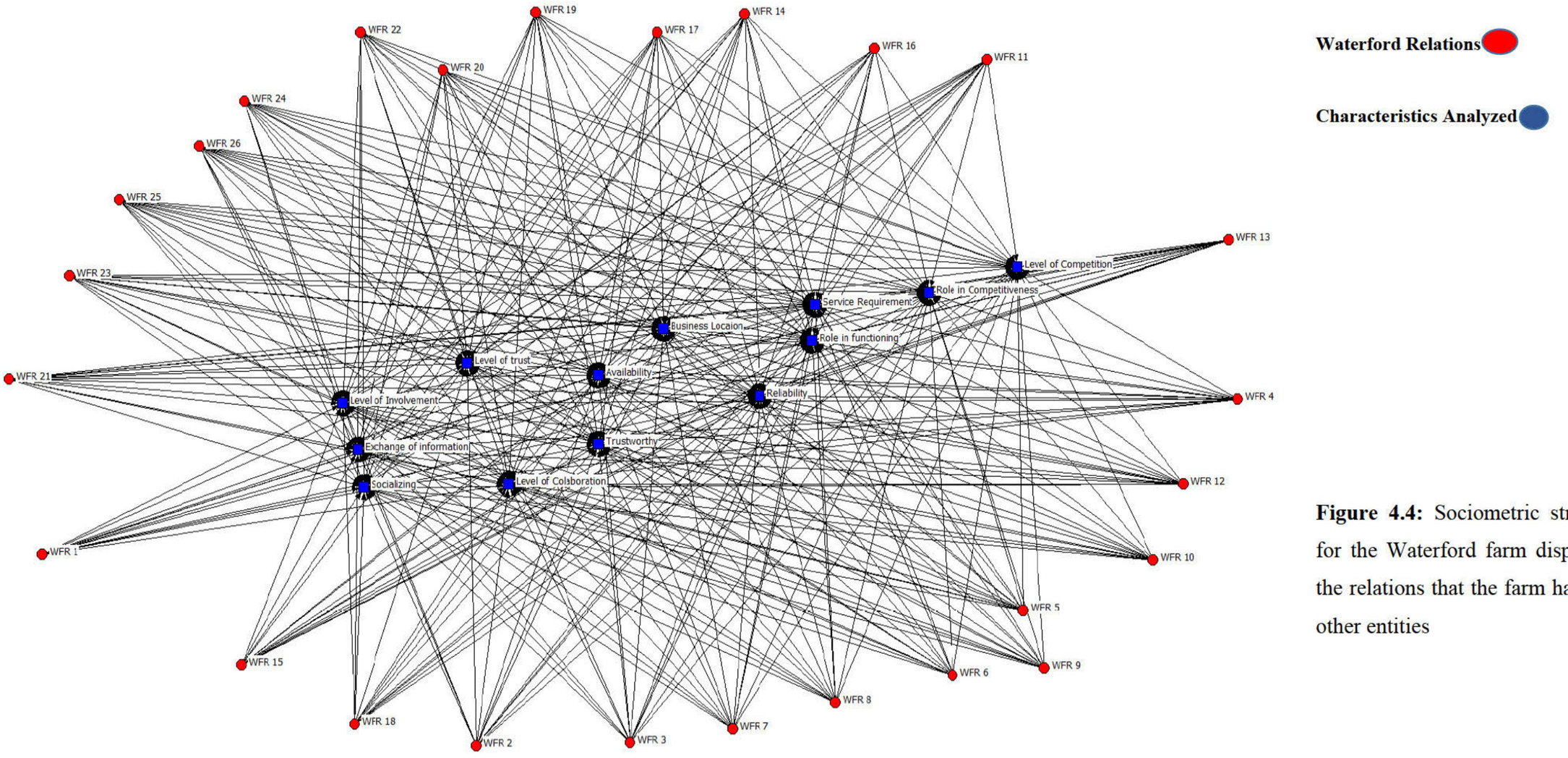

Figure 4.4: Sociometric structure for the Waterford farm displaying the relations that the farm has with other entities

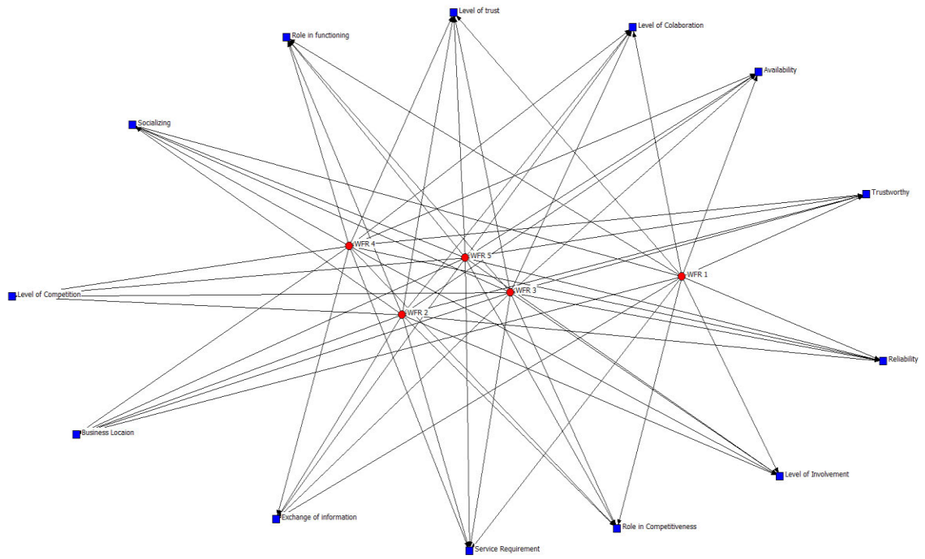

Figure 4.5: Sociometric structure for planning phase at Waterford

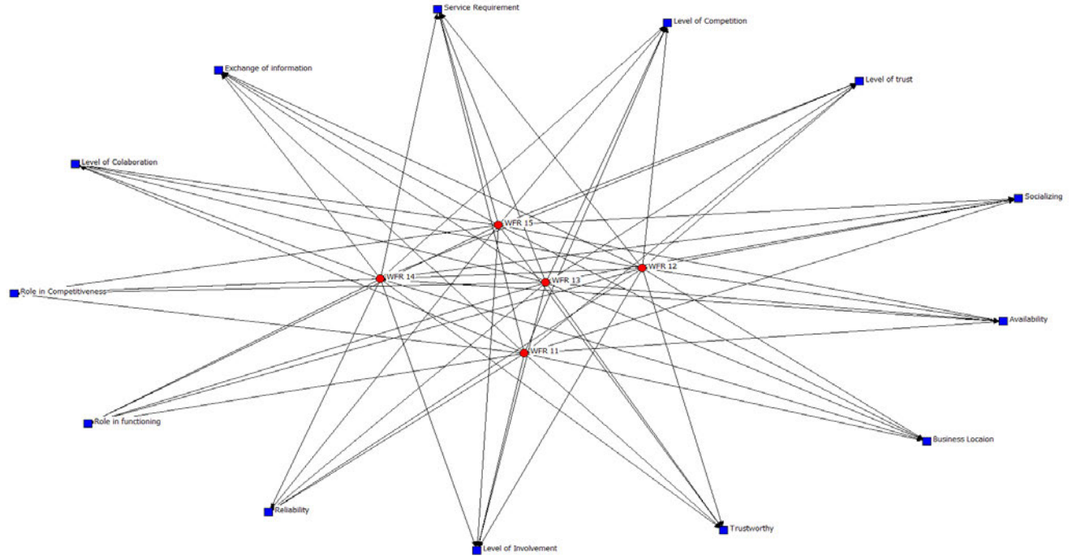

Figure 4.6: Sociometric structure for Productive tree management at Waterford

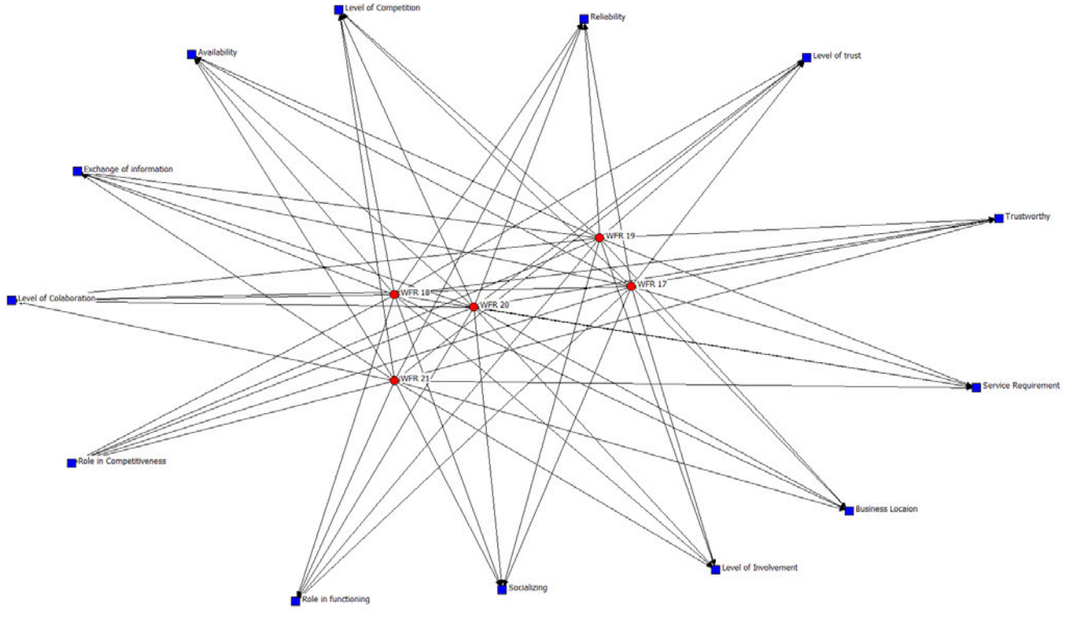

Figure 4.7: Sociometric structure for the Packhouse at Waterford

The producer was asked to elicit the interactions of the alters of Waterford Farm with **1=Interaction and 0=No Interaction**. The results of those interactions according to this producer are displayed in table 4.1. According to the results of this analysis, outside researchers (WFR 1) which this farm uses were found to be that entity that interacts the most with the other entities of this farm. This was because researchers gather all the information about the industry and use it to help the farmers and other South African avocado value chain actors to address different challenges. SAAGA (WFR 5) was also identified as also having many interactions with other entities. This is because of the level of involvement SAAGA has when it comes to their members. This level of involvement by SAAGA in the South African avocado value chain was highlighted in the previous chapter.

According to the farm manager, knowing such interactions between the alters (entities the farm is connected with) of the farm enables the farmer to have more flexibility in getting the services and information from their entities. For example, let us say the farmer wants to buy new young trees and when he goes to the nursery and only to find out that the nursery is only left with a few sets of trees which were supposed to be supplied to a certain producer who is also one of the entities that the farm interacts with when it comes to the exchange of information, lending of packhouse or whatever. Then this will allow the farmer an advantage to negotiate with the nursery and the producer about getting the trees. The farmer identified this nature of flexibility as one of the crucial facets of running an avocado farm business. Furthermore, knowing such relations and interactions enables the farm to develop effective strategies when it comes to the farm operations. These strategies include planning for efficient supplying channels for the farm avocados and other cost saving strategies.

Table 4.1: Interactions of the Waterford Farm alters

Relations	WFR 1	WFR 2	WFR 3	WFR 4	WFR 5	WFR 6	WFR 7	WFR 8	WFR 9	WFR 10	WFR 11	WFR 12	WFR 13	WFR 14	WFR 15	WFR 16	WFR 17	WFR 18	WFR 19	WFR 20	WFR 21	WFR 22	WFR 23	WFR 24	WFR 25	WFR 26
WFR 1		1	0	1	1	1	0	1	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	0
WFR 2	1		0	1	1	0	1	1	0	0	0	0	1	0	0	1	1	1	0	0	1	0	1	0	1	0
WFR 3	1	1		1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WFR 4	1	1	1		1	1	0	0	1	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1
WFR 5	1	1	1	1		1	0	1	1	0	1	0	0	1	1	0	0	0	1	1	0	1	1	1	1	1
WFR 6	1	0	0	1	1		0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0
WFR 7	0	1	0	0	0	0		1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
WFR 8	1	1	0	1	1	0	1		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
WFR 9	1	0	0	1	1	1	0	0		0	0	0	0	1	1	0	0	0	0	0	0	1	1	1	1	0
WFR 10	0	0	0	0	1	0	0	0	1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WFR 11	1	0	0	0	1	1	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
WFR 12	0	0	0	1	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	1	1	0
WFR 13	0	0	0	0	0	0	0	1	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
WFR 14	1	0	0	0	0	0	0	0	1	0	0	0	1		0	0	0	0	0	0	0	0	0	0	1	0
WFR 15	1	0	0	1	1	1	0	0	1	0	0	0	0	1		0	0	0	0	0	0	0	0	0	1	0
WFR 16	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0
WFR 17	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0		0	1	1	0	1	1	1	1	0
WFR 18	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1		1	1	0	1	1	1	1	0
WFR 19	1	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0	1	1		1	1	1	1	1	1	1
WFR 20	0	0	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	0
WFR 21	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1		1	1	1	1	0
WFR 22	1	0	0	1	1	1	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1		0	0	1	0
WFR 23	1	0	0	1	1	1	0	0	1	0	1	1	0	1	1	1	1	1	0	1	1	0		1	1	0
WFR 24	1	0	0	1	1	1	0	0	1	0	1	0	0	1	1	0	1	1	0	1	1	0	1		1	0
WFR 25	1	0	0	1	1	1	0	0	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1		1
WFR 26	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	1	

0= No Interaction; 1= Interaction

Source: Own processing

After going through business literature and consultations with industry experts and agribusiness managers, 12 factors were identified as factors which impact the competitiveness of businesses (table 4.2). Those factors business location of the entities, level of involvement of the entities, level of service requirement, reliability of the entities, availability of the entities, trustworthy, level of socializing between the business and the entities connected with, role played by the entities in the functioning of the business, level of trust between the business and the entities connected with, role of the services provided by the entities on the competitiveness of the business, level of collaboration between the business and the entities connect with, and the exchange of information between the business and the entities connected with. The farm and the entities that it is connected with were further analysed to investigate how these factors influence the functioning of the overall farm operations identified figure 4.1. Moreover, to determine how the functioning of those operations as a result of the relations that this producer has with its entities influences the overall performance and the competitiveness of this producer in the South African avocado value chain. This analysis used a set of structured and unstructured questions (Name interpreters) to prompt the producer to elicit the type of characteristics he uses to develop and maintain the relationships the farm has with its entities. Then the farmer was given an opportunity to quantify how these factors influences the functioning and the competitiveness of this farm using a 1-5 Likert scale with ***1 meaning more/high*** and ***5 less/low***. The results of this analysis are presented in table 4.2.

Table 4.2: Waterford farm relations and characteristics for these relations analysis

	Characteristics Analysed												
Farm Relations	**Business Location**	**Level of Involvement**	**Service Requirement**	**Reliability**	**Availability**	**Trustworthy**	**Socializing**	**Role in functioning**	**Level of trust**	**Role in the competitiveness**	**Level of Collaboration**	**Exchange of information**	**Mean**
WFR 1	2	3	3	2	3	2	4	2	1	0	1	1	**2**
WFR 2	2	1	1	1	2	1	3	1	1	2	1	1	**1,42**
WFR 3	2	2	1	2	2	1	3	1	1	1	1	1	**1,5**
WFR 4	1	1	1	1	1	1	1	1	1	1	1	1	**1**
WFR 5	4	1	2	2	3	1	3	1	1	1	2	2	**1,92**
WFR 6	3	2	1	1	1	1	3	1	1	1	3	1	**1,58**
WFR 7	1	1	1	1	1	1	3	1	1	1	2	1	**1,25**
WFR 8	2	1	1	1	1	1	3	2	1	2	2	2	**1,58**
WFR 9	1	2	1	1	1	1	3	1	1	1	1	1	**1,25**
WFR 10	2	3	2	1	1	1	3	2	1	2	2	3	**1,92**
WFR 11	1	1	1	1	1	1	3	1	1	1	1	1	**1,17**
WFR 12	1	1	1	1	1	1	3	1	1	2	1	1	**1,25**
WFR 13	2	3	1	1	1	1	3	2	1	2	2	1	**1,67**
WFR 14	2	2	1	1	1	1	3	2	1	1	2	1	**1,5**
WFR 15	2	1	1	1	1	1	3	1	1	1	1	1	**1,25**
WFR 16	2	3	2	1	1	1	3	2	1	2	2	1	**1,75**
WFR 17	3	2	1	1	1	1	3	1	1	1	1	1	**1,42**
WFR 18	2	2	1	1	1	1	3	1	1	1	1	1	**1,33**
WFR 19	2	2	2	2	2	2	3	1	1	1	1	1	**1,67**
WFR 20	2	1	1	1	1	1	3	1	1	1	1	1	**1,25**
WFR 21	2	1	1	1	1	1	3	1	1	1	1	2	**1,33**
WFR 22	5	1	1	1	1	1	3	1	1	1	1	1	**1,5**
WFR 23	3	1	1	1	1	1	3	1	1	1	1	1	**1,33**
WFR 24	2	1	1	1	1	1	3	2	1	1	1	1	**1,33**
WFR 25	2	2	1	1	1	1	3	1	2	1	2	2	**1,58**
WFR 26	5	2	1	1	1	1	3	1	1	1	1	1	**1,58**
Mean	**2,23**	**1,65**	**1,23**	**1,15**	**1,27**	**1,08**	**2,96**	**1,27**	**1,04**	**1,19**	**1,39**	**1,24**	**1,47**
SD	**1,07**	**0,75**	**0,51**	**0,37**	**0,60**	**0,27**	**0,45**	**0,45**	**0,20**	**0,49**	**0,57**	**0,51**	

0= Not applicable; 1= More/High; 5= Less/Low

Source: Own processing

The analysis showed that the farmer perceives that all 26 entities play an important role in the farm's ability to perform all its operations, with an overall mean of 1,47 out of 5 (Table 4.2). The packhouse has the biggest perceived influence on the functioning of the farm with an average of 1 out of 5. WFR 1 (researchers) were perceived to have the least involvement in the operations of this farm. Researchers, who are mostly required during the planning and establishment period, were also identified as the entities or services that have the least frequent interactions with the farm. The farmer also rated their level of involvement in the product, the farmer's service requirement, and the availability of researchers at 3 out of 5.

Land Preparation Contractors (WFR 7), Chemical Companies (WFR 9), Fertilizer companies (WFR 11), Security Company (WFR 12), Cold storage contractor (WFR 18), Off field transport contractor (WFR 21), Local retailers (WFR 23), and Local producers/Out growers (WFR 24) were identified as the top entities that are more involved in the operations of this farm and this producer also view these entities as playing a vital role in the functioning and the competitiveness of this farm. Furthermore, Government (WFR 25), Export markets (WFR 22), and SAAGA (WFR 5) were also identified by the producer as significant entities which are involved in the operations of this farm.

The producer ranked the influence of the different characteristics the farm has with all the its entities. During that analysis, trust (1,04) was identified by the analysis as the top characteristic between Waterford farm, and it’s alters. This is because according to Newman & Biggeman (2016), trust is an integral part of maintaining only successful business relationships, especially within agriculture. Moreover, farmers find value in working with entities that they trust (Wilson, 2000). Having assurances that each party will honorably hold their end of a transaction under any unforeseen circumstances generates value for both parties. According to this producer, the are no formal collaborations between this producer and any of the entities which are connected to this firm. Moreover, there are reported no foul play or any opportunistic behaviors from any of the 26 entitles the farm is connected with that this producer is aware of.

The findings of this analysis also revealed that most of these entities were considered as being trustworthy (1,08) by this producer. The producer also identified the farm alters as being reliable (1,15) during this analysis. For the farm to operate efficiently and move their avocados from farm to consumer, it was also found that the services of these entities are of greater importance (1,23) to the functioning and the competitiveness of this farm. These characteristics gave rise to stronger relationships, confidence toward the entity's services, and having this

characteristic also lowers transactional costs. This analysis revealed that there is not much socializing (2,96) between the farm and it's alters. The distance (2,23) between the farm and its entities was identified as significant hindrance, since this farm is located in KwaZulu-Natal and most of the avocado production is South African take place in Limpopo and Mpumalanga, hence most participants and major service providers of this value chain are located in these two provinces.

4.5 Conclusion

Waterford Farm was identified as having seven major operations which are responsible for the functioning of the farm. These operations are planning, establishment, young trees management, productive trees management, harvesting, packaging, and marketing. Under these operations, there are a number of activities that link the farm to external sources called entities, and those activities ensure the success of the farm operations. The producer develops these relations with the alters/entities based on the services that entities is/can provide for the farm activities.

Waterford farm, a commercially producing, packaging, processing, and marketing firm, was found to have 26 relations with different entities within and outside the South Africa avocado value chain. Many of the relationships with these entities enable the farm to do its day-to-day functions properly, and provide a competitive advantage against its local and global competitors. These relations are established and maintained on the bases of trust between the farm and the entities interacting with, how reliable the entities are to the producer, the type of service provided to the farm by these entities and how often does the farm requires them, and exchange of useful information. In turn, these help the farm with its overall functioning and competitiveness in the South African avocado value chain.

The farm manager plays a significant role in establishing and maintaining these relationships with these different entities. SAAGA was identified both in terms of the farm operations through the farm operations' case study, and the functioning and competitiveness through SNA to play a vital role for this producer. A large percentage of avocado production takes place in Limpopo and Mpumalanga in South Africa. Because of that, the results revealed that this farm which is in KwaZulu-Natal has identified the business location of most entities as a major constraint to its relations with its entities. Being professional when it comes to delivering the services by the entities and making sure that they provide the best-required service is very

important since the analysis reveals that there is not much socializing between this producer and his entities.

This study was able to demonstrate that having an understanding of the value chain relationships and linkages that a particular actor has with other actors could result in making more effective and efficient decisions that could improve the performance and competitiveness of that actor in the value chain. Therefore, a study of this nature can be further improved by analysing all the different types of actors who are in this value chain and the relationships they have with other actors within and/or outside this value chain with an aim of developing strategies targeted at improving the efficiency of this value chain, which could positively influence the overall performance and competitiveness of this value chain.

Understanding the relationships that are in the South African avocado industry could benefit the industry in number many of ways, most notable with strategic planning and development. The success, performance and competitiveness of this value chain could be improved by understanding the relationships between the actors of this chain and develop strategic based on the nature of those relationships. This information can also be used to identify certain weaknesses and strengths which are associated with particular relations, which might include the different behaviours (i.e., opportunistic behaviours) of certain actors. Moreover, such information can be used to identify areas of collaborations for a different number of value chain actors all aiming at improving the functioning and the competitiveness of this value chain, especially when it comes to export markets.

CHAPTER 5: AN ASSESSMENT OF THE SOUTH AFRICAN AVOCADO INDUSTRY'S COMPETITIVENESS

Abstract

The purpose of this chapter is to identify the current South African avocado industry's production and consumption rates, assess the industry's competitiveness, and compare it with that of its major rivals in the EU and UK avocado markets. To achieve this, **Comparative Advantage** (**RCA**), **Net Trade Performance Index (RCA1), Relative Import Advantage Index (RMA),** and **Relative Export Advantage Index (RXA)** and **Revealed Comparative Advantage (RTA)** were used to assess and measure the competitive advantage of the South African avocado industry and those of the industry's global rivals which are Mexico, Peru, Israel, Kenya and Spain. RTA was also used to compare the trade performance of the South African avocado industry with that of its EU and UK competitors. Results showed that Peru, Mexico, Kenya, and Israel have a higher competitive advantage and trade performance than South Africa. As part of improving the competitiveness, the industry needs to put in place the following strategic actions which could help improve the competitiveness of this industry in the global avocado markets, which include the develop late-maturing varieties, access to new global markets and develop strategies that will help the industry to take full advantage of the growing local demand. Findings of the analysis presented in this chapter provided a detailed quantitative competitiveness analysis of the South African avocado industry and how it compares with that of its major rivals in the exports markets.

Keywords: Competitiveness, Global Rivals, South Africa, Markets

5.1 Introduction

The level of prosperity that a nation may achieve depends on the interaction of three forces: competitiveness of the individuals, competitiveness of firms, and the competitiveness of a country (Anca, 2012). Since the South African government deregulated agricultural markets and trade policies which changed the competitive environment for the South African agriculture and agribusinesses, both the South African agricultural producers and agribusinesses have had to adapt to a new competitive environment to sustain and grow their domestic market share and contribute to national economic growth (Ortmann, 2005).

Competitiveness determines the ability to enter and conquer new markets, perform better than other players in the market, attract investment, and grow (Falciola *et al.*, 2020). To make the value chain to be more competitive, it is important to identify factors that need to be adjusted, and proper adjustments could contribute to changing negative value chain situations into positive situations which might ultimately improve the competitiveness of the value chains (Esterhuizen *et al.*, 2012). To determine the effectiveness and efficiency of activities within a value chain, it is necessary to measure its performance (Savic *et al.*, 2016). According to Toth (2012), agricultural enterprises that are regarded as competitive can generate extra profit above the socially acceptable level in a free, open, and competitive market.

According to Ortmann (2005), there are many factors which contribute to the South African agriculture industry not being able to realize its full competitiveness ability and because of that, there is a need to consider strategies and institutional innovations that will promote the competitiveness of the South African's agricultural sector. Many studies have been done in South Africa to address the issue of competitiveness for different South African agricultural sub-sectors (Blignaute (1999); Esterhuizen & Van Rooyen (1999); Van Rooyen *et al.* (2000); Esterhuizen *et al.* (2002); Hardman *et al.* (2002); Mahlanza *et al.* (2003); Esterhuizen (2006); Esterhuizen & Van Rooyen (2006); Mashabela & Vink (2008); Du Toit (2009); Ndou & Obi (2011); Van Rooyen *et al*. (2011); Van Rooyen & Esterhuizen (2012), Jafta (2014); Boonzaaier (2015); Dlikilili (2018), Sibulali (2018) and Nkamisa (2020)). These studies were done to identify and recommend different strategies to make those sub-sectors more competitive, which could result in a more competitive agricultural sector.

The main objective of the analysis in this chapter is to identify the current South African avocado industry's production and consumption rates, assess the competitiveness of this industry, and compare it with that of its global rivals in the export markets. This analysis will

serve as a background information in identifying the actual state of the South African avocado value chain competitiveness which will also be applied in the upcoming analyses/chapters Furthermore, this information would be used to develop and recommend strategic actions that could be used by industry participants to improve the competitiveness of this value chain. This analysis is an initial step in trying to address the research problem stated in Chapter one.

The main objective of this chapter will be achieved through:

- *Assessment of the current state of the industry's production and consumption rates*
- *Measure and analyse the competitive advantage of the South African avocado industry*
- *Analyse the trade performance of the South African avocado industry, and*
- *Compare the South African avocado industry's competitive advantage and trade performance with that of its global rivals (Peru, Mexico, Kenya)*

The next section provides an overview of the peer-reviewed local and international economic literature on competitiveness and the different ways to measure it. Section 5.3 provides an overview of the methodology to be used in this chapter. The measurement and the analysis of the South African avocado value chain competitiveness is provided in section 5.4. Conclusions are drawn in section 5.5.

5.2 Competitiveness and how to measure it

The review of competitiveness studies presented in this section aims to provide a sound understanding of the concept of competitiveness and the methods used to measure it. This is done with an aim of identifying (a) a definition of competitiveness that will be adopted for this study and, (b) methods suitable for measuring and analysing the competitiveness of the South African avocado value chain.

To be competitive not only requires a firm to sell or attain a given market share, but it must also do this at a profit that will enable it to continue existing (Bahta & Malope, 2014). This requires firms to be more efficient in their resource use and hence productivity is an important aspect of competitiveness. Hoang *et al.* (2017) defined competitiveness as the productivity of labour, capital, or natural resources. The quality of domestic linkages and domestic support systems plays an important role in creating international competitiveness. For firms to compete internationally, they require an effective domestic value chain (Schmitz, 2005). Schmitz (2005) further explained that suppliers that provide on-time delivery of high-quality inputs and support

institutions that can test the quality of the inputs and certify conformance with international standards will result in a more effective value chain.

According to Babu & Shishodia (2017b), competitiveness can be defined at both the micro and macro levels when it comes to economics. At the microeconomic (firm) level, competitiveness is defined as the ability of firms to consistently and profitably produce products that meet the requirements of an open market in terms of price and quality (Domazet, 2012; Babu & Shishodia, 2017a) and at the macroeconomic level, it is defined as the set of institutions, policies, and factors that determine the level of productivity of a country (World Economic Forum, 2015; Babu and Shishodia, 2017b). European integration has enhanced the need for competitiveness at the microeconomic level, which was targeted for enterprises operating in tradable (export-oriented) and non-tradable sectors (Erik & Judit, 2005). If competitiveness at the producer level is manifested perfectly, it will result in long-term subsistence and economically sustainable development (Modos, 2003; Toth, 2012).

According to Falciola *et al.* (2020), most of the literature which defines competitiveness emerged in the 1980s and 1990s, and that literature can be divided into two streams. The first view associated competitiveness with lower labour costs and favourable home countries policies (Brander & Spencer, 1998; Krugman, 1994). The second view associated competitiveness with productivity (Porter, 1990; Krugman, 1990, 1994; Delgado *et al.*, 2012). The productivity-based view has emerged as one of the most used in defining competitiveness. It has remained as the commonly used indicator of good performance and competitiveness. Falciola *et al.* (2020), aimed at designing a multidimensional framework to measure competitiveness at the firm level, argued that the productivity view has two shortcomings in policymakers who wish to improve the competitiveness state of their countries. Firstly, it does not provide information on the determinants of competitiveness, which means policymakers will not know which tools to use to improve competitiveness. Secondly, productivity only reflects a static measure of competitiveness, and it does not provide information about whether the competitiveness is ready to face changes in the economic environment.

5.2.1 Comparative Advantage and Competitive Advantage

Competitive and comparative advantage are two important concepts that act as a foundation in understanding international trade (Porter, 1990; Van Rooyen *et al.*, 2000; Dlikilili, 2018) and are sometimes confused with each other (Mashabela, 2007). These two concepts are important

not only to trade but as well as to illuminate the underlying factors responsible for current trade patterns (Esternhuizen & van Rooyen, 1999).

Competitive advantage is important to retain the long-term success or growth of a nation. There is no competitive nation without having competitive firms, and the nation's competitiveness strongly depends on a firm's competitiveness (Chikan, 2008; Sachitra, 2016). Competitive advantage can be defined as a firm's ability to improve the quality of its products, reduce the costs of its products, or grow its market share of profit (Grupe, 2010; Sachitra, 2016). According to Porter (1990), competitive advantage can be defined as productivity growth reflected in either lower costs or differentiated products that charged premium prices. The ability of a firm from a specific region to compete with other firms from elsewhere is the definition of the competitive advantage given by Smith (2013).

Competitive advantage can also be defined in terms of operational as a specific way of using the resources available and other detailed activities to keep the firm separate from its competitors and keep it active and growing (Sachitra & Chong, 2015). Sachitra (2016) noted that the given definition consists of three characteristics: long-term survival, difficulty to imitate, and difficulty to identify. In addition, the ability to perform activities and manage the links between them is a source of competitive advantage (Porter, 1985).

Comparative advantage is also defined as the ability of one country to produce a commodity at a lower opportunity cost relative to the output of another country (Lindert & Pugel, 1996; Pugel, 2012). Comparative advantage, therefore, indicates whether it is economically advantageous to expand the production and trade of specific commodities (Pugel, 2004). In addition, a comparative advantage clarifies how trade could potentially benefit a country through more efficient use of resources (land, labour, and capital) when the trade is unrestricted (Lispey *et al.*, 1993; Angala, 2015). However, Kannapiran & Flemming (2000) argued that comparative advantage is a concept that applies to inter and intra industry comparisons within a country in the traded goods sector. Still, it is of little use when it comes to intra country comparisons.

5.2.2 Measuring competitiveness

Latruffe (2010) divided the methods to measure competitiveness into two categories: Neoclassical economics and Strategic management school.

Neoclassical economics: Focus on trade issues and measure competitiveness using real exchange rate, comparative advantage indices, export and import indices, and other related metrics

Strategic management school: the emphasis is on the firm's structure and strategy. It defines competitiveness as the cost of leadership and/or non-price supremacy and competitiveness measures that fall under this category, include cost, profitability and productivity, and efficiency.

5.2.2.1 Revealed Comparative Advantage (RCA)

The competitive advantage method was developed by (Balassa, 1965) as a basis to measure competitiveness (Boonzaaier, 2015). According to Balassa (1965), RCA could be indicated by the trade performance of individual commodities and countries in the sense that a commodity pattern of the trade reflects relative market costs as well as differences in non-competitive factors. In some literature, the RCA is referred to as the Balassa method, which compares a country's share of the world market in one commodity relative to its share of all traded goods. This method was advanced by Vallrath (1991) to avoid double counting between pairs of countries. Vallrath (1991), offered an alternative specification of RCA, resulting in an analysis of international competitiveness (RTA) in agriculture from a world perspective. This measure provides insights into the static competitiveness of a commodity through a comparison of the share of the commodity in domestic exports with that of the world markets (Edward & Schoer, 2001).

5.2.2.2 Relative Trade advantage (RTA)

Competitive advantage is indicated by the trade performance of individual commodities, supply chains, and countries in the sense that each commodity's trade pattern reflects relative market costs as well as differences in non-price competitive factors such as government policies (Volrath, 1991; Almodarra & Saghanaia, 2016). Therefore, it is vital to determine the success of a particular sector in selling its products over time for both the local and foreign markets. The RTA method measures competitiveness under real-world conditions, including an uneven economic field, distorted economies, and varying trade regimes (Valrath, 1991, Esterhuizen, 2006).

Farto & Hubbard (2001) noted that RCA and RTA have a problem since trade patterns observed are likely to be distorted by government policies and interventions and may misrepresent underlying comparative advantages.

5.2.3 South African agriculture and agribusiness competitiveness

Agricultural policy and practices in South Africa have been and will continue to experience dramatic changes, and these changes, together with changes in the forces that affect the global market for agricultural products, require that farm products and agribusiness have to position themselves as business-driven competitors in a less controlled "free market" global trading environment (Esternhuizen & van Rooyen, 1999). Since the early 1980s, the South African trade regime has shifted from import substitution to export-oriented (Edward & Schoer, 2001).

A study conducted by Ntombela (2017) which was looking at the competitiveness of the South African agricultural sector performance in terms of institutions, infrastructure, and labour markets, indicated that the agricultural sector performance was much lower than the South African economy (Figure 5.1). From the same figure, it is clear that technology readiness in agriculture is lagging behind relative to the rest of the economy, which also impacts this sector's competitiveness.

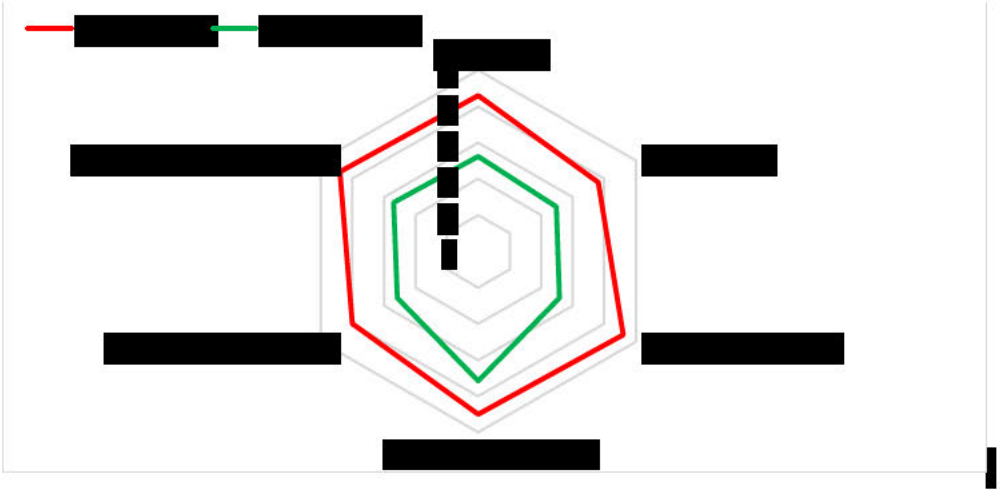

Figure 5.1: The South African economy versus agricultural sector performance

Source: WEF and Agbiz (2017); Ntombela, (2017)

A similar study also looked at the competitiveness change in the South African agribusiness sector between 2014 and 2017 (Figure 5.2). It was clear that the land issue is one of the key factors driving the confidence and competitiveness in the sector.

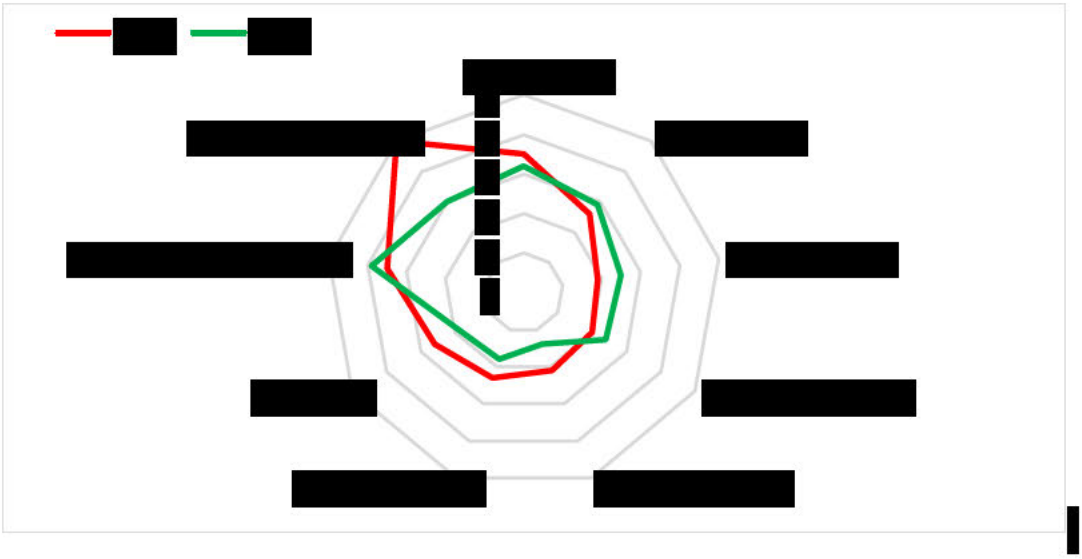

Figure 5.2: The South African agribusiness sector competitiveness performance

Source: Agbiz (2017); Ntombela (2017)

Ntombela concluded that the agribusiness sector's competitiveness had been declining from 2015 to 2017, and this was because of the occurrence of drought and rising policy uncertainties in the sector. The recommendations that were made to increase competitiveness in the sector, more efforts are to be put in creating a transparent and clear policy direction on land reform and tax reform in the country. When it comes to the land reform issue, establishing a land audit that consists of all affected stakeholders is required. New proposed policies such as sugar tax and carbon tax must give clear guidelines on how revenue recycling options are necessary to alleviate concerns on investors operating in sensitive and trade-exposed industries such as agriculture. This study is one of many examples which serves as evidence when it comes to the important role of conducting competitiveness analysis studies for particular industries.

A study conducted by Esterhuizen & van Rooyen (1999), showed that the South African agribusiness industry was generally marginal as far as international competitiveness is concerned since most of the RTA values were situated around zero. They concluded that to compete in a global economy, farmers and agribusinesses will have to be competitive. The scarce resource will need to be optimally utilized and evolve to create pockets of excellence in a sector, embracing the concept of the agricultural value chain. According to Mosoma (2004), the ability to maintain and improve the competitiveness of the South African agricultural sector remains critical, particularly when considering the changes that have occurred in the sector in the last decades.

Competitiveness has remained one of the most challenging and controversial concepts, and there are disagreements amongst economists about its measurements and appropriate indices to be used (Van Rooyen *et al.*, 2011). According to Falciola *et al.* (2020), there is no universal and exact definition for competitiveness since different organizations/firms view it differently. These authors went further by mentioning the two common views of competitiveness by different firms. Some organizations view competitiveness as the ability of one organization to persuade or attract customers to choose their product or service over their rivals. In contrast, others view competitiveness as the ability to improve continuously in their production processes. DAFF (2019) defined competitiveness in the context of the South African avocado value chain as an industry's capacity to create superior value for its customers and improved profits for the stakeholders in the value chain. According to Van Rooyen *et al.* (2011; Page 108), "… to be competitive in today's world is to be in a position to continue to trade successfully relative to the competition i.e., to consistently outperform the completion".

The South African avocado industry is export oriented and most players in this industry view competitiveness as being successful in the export markets. This was indicated by the actors during early consultations of this study. This was further confirmed through engagements with Mr Derek Donkin, the CEO of the South African Subtropical Growers Association. Donkin cited by (Cape Business News, 2019) stated that maintaining global market access for local produce is one of the industry's top priorities for the future.

With all of these in mind, the following definition of competitiveness will be used in this study:

"The ability to expand the trade of the South African avocados relative to its competitors in order to attract investment and other scarce resources to achieve sustainable returns."

5.3 Methods and Materials

For this analysis, competitiveness will be measured based on a methodology by Simo *et al.* (2016) and Senyshyn *et al*. (2019) in which competitiveness is based on **RCA**, **RCA1, RMA, RXA** and **RTA**. This is done with an aim of providing a more detailed measurement of the South African avocado industry's competitiveness. Previous competitiveness studies in South Africa have mostly used RTA only to measure value chain competitiveness. The purpose of these indicators is to provide a qualitative aspect to this study in order to support all the qualitative competitiveness analyses of this study.

This methodology also allows for comparison of the competitive advantage and trade performance of the South African avocado industry with that of its top competitors in the EU

and the UK markets. The countries identified by the South African Department of Agriculture, Forestry and Fisheries as strong competitors for the South African avocado industry in these exports markets will be used for this analysis. Those countries are Mexico, Peru, Israel, Kenya and Spain. The following indices and parameters will be applied as adapted from Simo *et al.* (2016) and Senyshyn *et al.* (2019):

5.3.1 Revealed Comparative Advantage (RCA)

$RCA = \ln [(xij:mij)/(X_j :M_j)]$ (**1**)

xij = export value of the i-th product groups of analysed sector of the country j

mij = import value of the i-th product groups of analysed sector of the country j

Xij = total export value of country j

Mij = total import value into the country j

Interpretation if:

parameter RCA > 0: commodity has a comparative advantage;

parameter RCA < 0: commodity has a comparative disadvantage.

parameter RCA = 0: neither a competitive advantage nor disadvantage.

5.3.2 Net Trade Performance Index (RCA 1)

$RCA\ 2= [(X_{ij} - M_{ij})] /[(X_{ij} + M_{ij})]$ (**2**)

X_{ij} = exports of the country "i" in the commodity group "j"

M_{ij} = import of country "i" in the commodity group "j"

Index value varies within the range –1 do +1. Since –1 there is a comparative disadvantage, up to +1 there is a comparative advantage.

Interpretation, if:

RCA 2 = –1, reduced exports (refers to comparative disadvantages);

RCA 2 = +1, reduced imports (refers to revealed comparative advantage).

If the value of exports equals the value of imports, then the RCA 2 index is zero.

5.3.3 Relative Import Advantage Index (RMA)

$RMA_{ij}= [(M_{ij}/ \sum M_{il})]/[(\sum\sum M_{kl}/\sum M_{kj} /)]$ (**3**)

M_{ij} = imports of the observed commodity "i" from country "j"

$\sum M_{il}$ = sum of the imports of commodity "i" from all EU countries except the country "j" $\sum Mkj$ = sum of all imports of commodities except the commodity "i" from country "j" $\sum\sum Mkl$ = sum of all imports of commodities except the observed commodity "i" from all EU countries except the country "j"

5.3.4 Relative Export Advantage Index (RXA)

$RXA = [(X_{ij}/\sum X_{il})]/[(\sum X_{kj}/\sum\sum X_{kl})]$ (**4**)

X_{ij} = the monitored commodity exports from the country

$\sum X_{il}$ = sum of observed commodities to all European countries except the particular country

$\sum X_{kj}$ = sum of all exports of commodities except the observed commodity into the particular country

$\sum\sum X_{l}$ = sum of all exports of commodities except the observed commodity in all European countries except the particular country

5.3.5 Relative Trade Advantage Index (RTA)

RTA is much more complex than the indices RXA and RMA because it considers both export and import and expresses the difference between the RXA and RMA

$RTA_{ij} = RXA_{ij} - RMA_{ij}$ (**5**)

Based on mentioned indicators, the competitiveness is evaluated as follows: Interpretation, if:

RXA > 1 and RTA > 0, so there is competitiveness,

RMA > 1 and RTA < 0, so there is no competitiveness.

The data used for this analysis will be accessed on International Trade Centre (ITC) (www.trademap.org). According to Esterhuizen & Van Rooyen (2006), these time-series databases provide the necessary trade data required to analyse the competitive performance of commodities over time. ITC covers statistics of 5300 H-S coded provides traded from 220 countries, and it provides import values and volumes, export values and volumes, growth rates, market share for products across all different sectors of the economy (Van Rooyen *et al.*, 2011). In a context of competitiveness, this data will be utilized to compile a multisectoral-based competitiveness index, as ITC statistics considers all products traded in all sectors of the economy.

5.4 Results and Discussion

5.4.1 South African avocado industry's production and consumption

From 1970 to mid-1990s the South African avocado industry depended mainly on exporting and selling their avocados to the municipal markets (commonly known as the NFPM) (Figure 5.3). As production started to increase and chances in the country's marketing policies, during the late 1990s the industry started to develop and open up new selling channels like processing of avocados, informal markets and direct to retail as highlighted in chapter 5 (5.3). All these channels place focused more on the local consumers.

South African avocado production has been increasing since it starts from 1970. According to SAAGA (2020), the avocado industry in South Africa has expanded steadily from the early 1970s to 2003, with the planting of 2000 ha in 1970 increasing to 12 000 ha in 2003. Since 2009, total planting has increased due to growing consumer demand for avocado, with the area of commercial avocado orchards standing around 17 000 ha with new planting amounting to approximately 1000 ha per annum (Donkin, 2020).

However, producers have not been able to achieve a constant increase in production due to various factors. One of the major factors causing this issue is *alternative bearing*. Shalom *et al.* (2012) defined alternative bearing as the tendency of a fruit tree to produce a heavy crop in one year (on-year) followed by a very light crop or no crop (off-year). This process can result in producers having to experience tremendous financial losses in more extreme cases. Alternate bearing has a severe negative economic impact on the commercial avocado industry and also it is not good for market growth (SAAGA, 2020). Irregularity in fruit production adversely affects fruit-producing and processing industries (Patterson & Gardener, 2021). To have a staple supply chain system, producers must maintain a more constant production level. In the South African avocado industry, the top producing regions which are Limpopo and Mpumalanga have similar weather and climatic conditions which results in them experiencing almost similar alternative bearing which causes the trends in the production of avocados in South Africa as shown in figure 5.3.

Avocado consumption is expected to remain increasing due to the rise of the Latin American population in the USA and Europe (South Africa's biggest export destination), which makes up the high percentage of the world's consumption percentage of avocados (Krasniqi *et al.*, 2017). The European markets, has experienced an increase from 650 000 tons (2018) to more than 1 100 000 tons (2020), and experts in the field are projecting more of this increase (Krasniqi *et al.*, 2017). In addition, the South Africa local consumption of avocados plays a significant role, with demand having grown considerably over the past few years (Donkin, 2020). When it comes to the South African local avocado markets, industry participants have revealed that they have not fully realized the full potential that the local market has to offer. This is due to the what has been classified as a growing middle class and the industry has not developed enough strategies to attract this growing group of consumers.

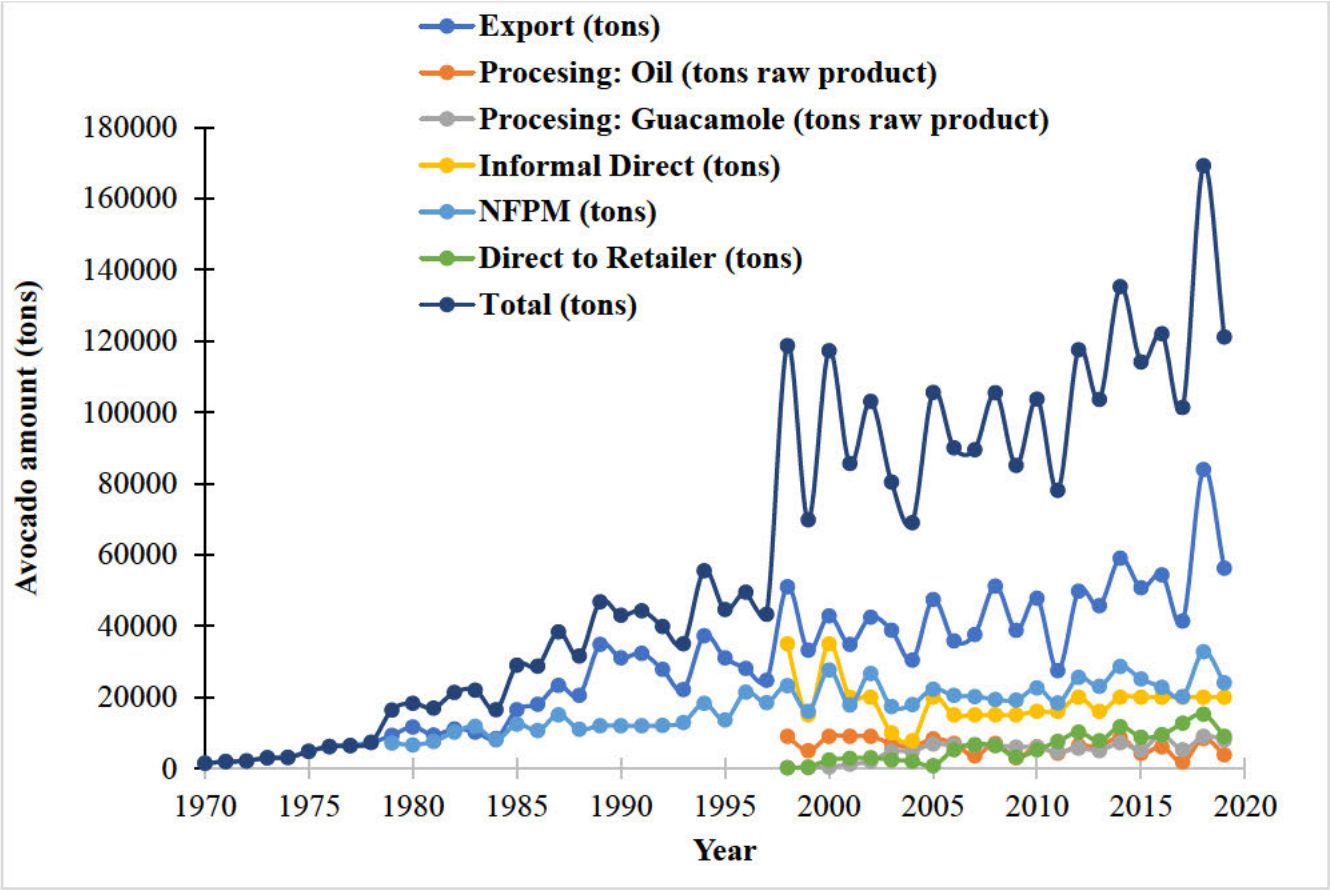

Figure 5.3: South African production figures from 1970-2019

Source: Own processing of the data from SAAGA (2021)

5.4.2 Measuring competitiveness of the South African avocado industry

According to Oelgemoller (2012), when using the RCA index (figure 5.4), the critical value is one: values above one indicates comparative advantages, whereas values between zero and one indicate comparative disadvantages. According to the finding of this analysis, the South African avocado industry has a comparative disadvantage in the EU and UK markets when compared with its global rivals in these markets. Furthermore, the South African avocado industry was revealed as having the lowest competitive disadvantage than all of its major global rivals in the EU and UK markets. Spain and Israel were revealed as having competitive disadvantage in the EU and UK avocado markets as well while Mexico, Peru and Kenya were revealed by this index as the countries which have the competitive advantage in these markets. This analysis revealed Kenya and Peru as the top competitors for the South African avocado industry in the EU and UK avocado markets. Over this period (2001 to 2019), the analysis revealed the Peruvian avocado industry as having a big increase in RCA in these markets while the Israelite industry experience a significant reduction. Mexico, a global producer and exporter

of avocados, has a higher RCA than South Africa, Israel, and Spain but a lower RCA than Peru and Kenya in the EU and UK avocado markets.

Revealed Comparative Advantage (RCA)

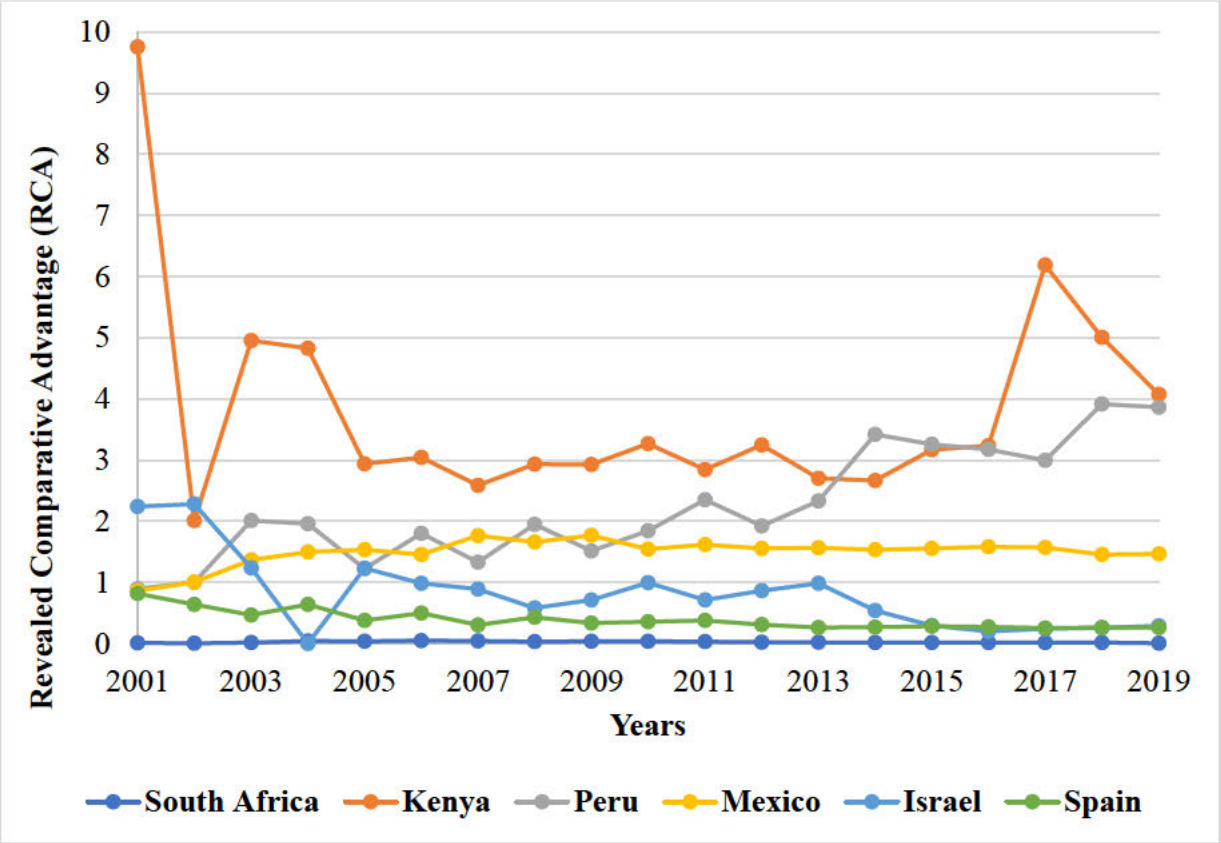

Figure 5.4: Comparison of competitive ability of the South African foreign trade of avocado with those of major global rivals using RCA index

Source: Own processing of the data from ITC (2021)

When comparing the competitiveness of the South African avocado industry with that of its major competitors using net trade performance (RCA 1), it was revealed that South Africa has the lowest net trade performance when compared with Kenya, Mexico, Peru, and Israel but the South African avocado industry has the highest comparative advantage when compared with Spain as shown figure 5.5.

Net Trade Performance Index (RCA 1)

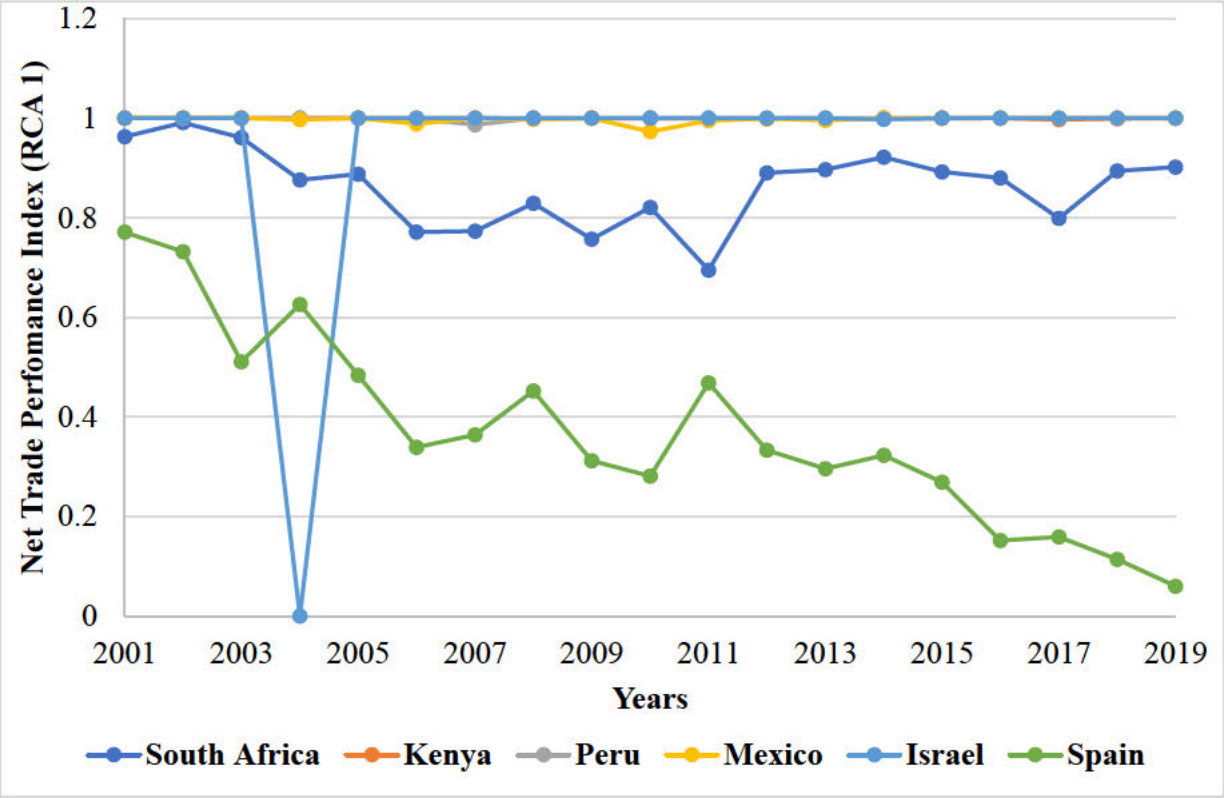

Figure 5.5: Comparison of competitive ability of the South African foreign trade of avocado with those of major global rivals using RCA 1 index

Source: Own processing of the data from ITC (2021)

RMA (Table 5.1), RXA (Table 5.2), and RTA (Figure 5.6) showed that South Africa is competitive in the trade of avocado globally. However, when the South African avocado industry is compared with its global rivals, the results show that it has the lowest competitive advantage than all of its major global rivals. This index also revealed Kenya and Peru as South Africa's top global rivals the EU and UK avocado markets. Moreover, the results of index also revealed that the competitiveness of the South African avocado industry has been decreasing since 2001 while that of Peru and Mexico has been experiencing a significant increase.

Relative Import Advantage Index (RMA)

Table 5.1: RMA value for the South African avocado industry and those of global rivals

Countries	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
South Africa	0,13	0,04	0,16	0,39	0,40	0,44	0,45	0,36	0,39	0,48	0,46	0,33	0,28	0,20	0,21	0,20	0,25	0,22	0,11
Peru	0,00	0,00	0,00	0,00	0,00	0,01	0,08	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00
Mexico	0,00	0,00	0,00	0,02	0,00	0,09	0,00	0,02	0,00	0,24	0,05	0,02	0,04	0,00	0,00	0,00	0,00	0,00	0,00
Kenya	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,00	0,00	0,00	0,04	0,01	0,00
Israel	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00
Spain	0,70	0,63	1,13	1,03	1,04	1,81	1,18	1,38	1,60	1,83	1,39	2,00	1,73	1,56	1,84	2,20	2,14	2,34	2,44

Source: Own processing of the data from ITC (2021)

Relative Export Advantage Index (RXA)

Table 5.2: RXA values for the South African avocado industry and those of global rivals

Countries	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
South Africa	7,63	12,21	4,27	7,66	8,23	4,94	4,53	5,07	3,76	5,48	2,66	5,91	1,36	6,07	4,32	3,57	2,22	4,15	2,32
Peru	9,08	10,11	9,99	21,35	15,16	22,64	17,37	27,52	19,67	24,12	31,50	27,56	7,26	48,41	45,43	41,48	40,76	52,02	49,30
Mexico	8,75	10,16	6,78	16,32	18,98	18,27	23,05	23,43	22,95	20,23	21,72	22,33	4,89	21,77	21,71	20,68	21,42	19,33	18,72
Kenya	98,48	20,29	24,55	52,60	36,30	38,18	33,78	41,33	37,95	42,67	38,13	46,57	8,43	37,76	44,17	42,28	84,23	66,50	51,96
Israel	22,64	23,02	6,13	0,00	15,19	12,42	11,64	8,19	9,27	13,05	9,56	12,44	3,07	7,68	4,09	2,59	3,29	3,42	3,70
Spain	8,26	6,46	2,32	6,98	4,70	6,25	4,00	6,07	4,40	4,69	5,09	4,47	0,83	3,83	3,98	3,62	3,47	3,47	3,38

Source: Own processing of the data from ITC (2021)

Relative Trade Advantage Index (RTA)

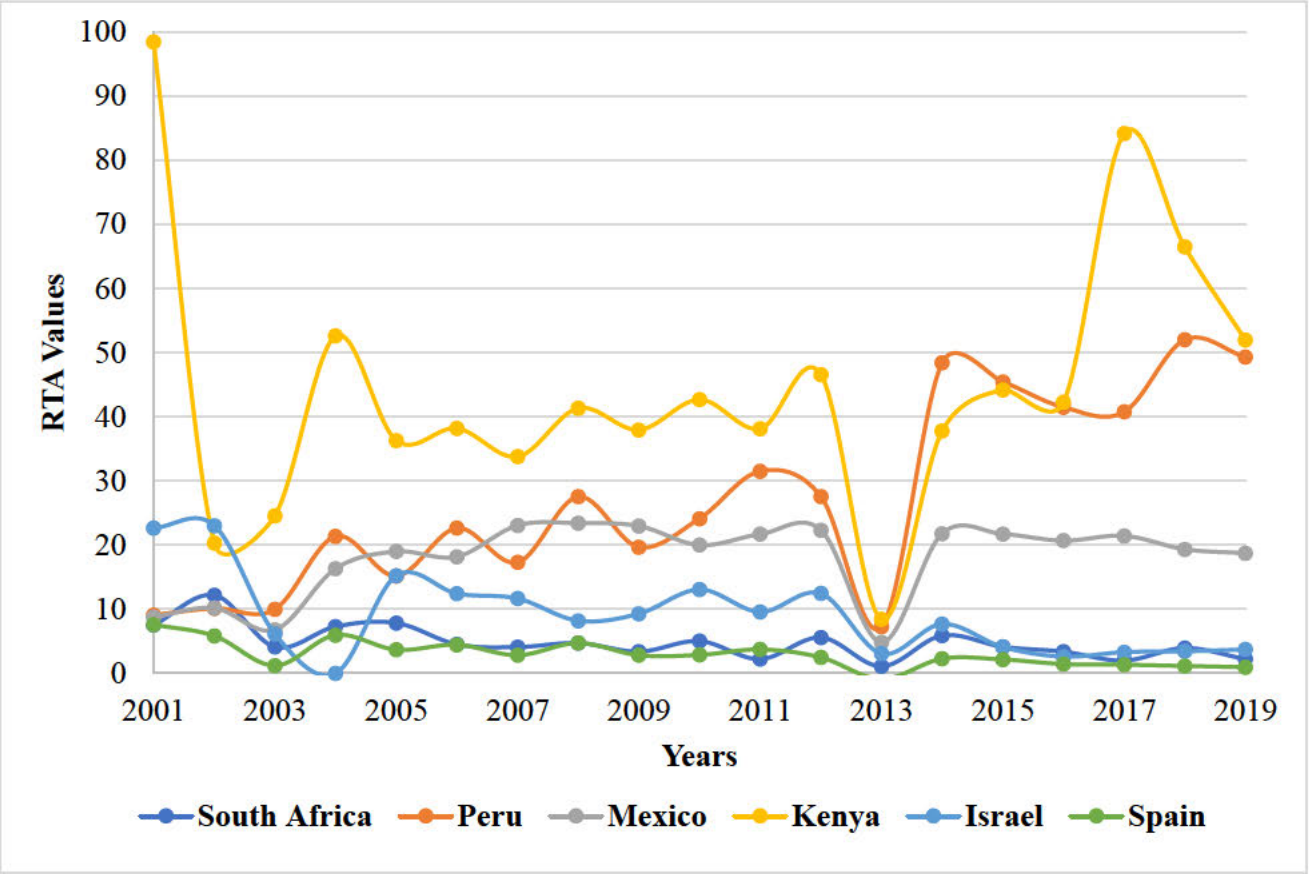

Figure 5.6: RTA values for the South African avocado industry with those of its global rivals

Source: own processing of the data from ITC (2021)

Freshplaza (2020a) identified Peru and Kenya as fast growing suppliers of avocados in the European market, which is one South Africa's top exporting destination for avocados. Kenya has been identified as one of the fastest-growing avocado exporters globally (Workman, 2021). Peru's core strategy is to expand its production and gain a larger share of the world market, especially in North America and Europe (Freshplaza, 2020b). All these indices used in this study have identified Kenya and Peru as South Africa's major rivals in the EU and UK avocados export markets. This is because both these countries are in the Southern hemisphere region together with South Africa as a result, they produce and supply avocados at the same time.

The indices used in this analysis also showed a significant decline in the comparative advantage and trade performance for Israel in 2004. According to Bedington (2005), in that same year, Israel exported 50 000 tons of avocados which was a 66% increase from previous year which was 2003. Israel is among the top producers and exporters of avocados globally with an average harvest of 100 000 tons and still growing (Imbert, 2018).

According to Oelgemoller (2012), RCA compares the relationship of national exports (X) of a single commodity (i) to total exports of all commodities, with ratio of worldwide (w) exports of that commodity (X_i^w) to total exports per annum. Based on the information provided above, there is a clear indication that this significant decline is as a result of the weaknesses which are associated with the use of these indices. For example, when using RCA to analyse the competitiveness of the Israel avocado industry it is clear that this country exported far less avocados in relation to the country's total commodities and total commodities exported in world markets.

5.5 Conclusion

The South African avocado industry has been experiencing growth both in terms of production and consumption of this fruit. This growth in production is as a result of many avocado farms expanding their operations, and many new players entering this industry because of the current and projected demand for this fruit. However, this growth has not been constant because of alternative bearing.

The overall results of this analysis have revealed the South African avocado value industry as having a competitive disadvantage in the export markets. Moreover, it was also revealed that South Africa has the lowest net trade performance when compared with Kenya, Mexico, Peru, and Israel but the South African avocado industry has the highest net trade performance when compared with Spain. All these indices used in this study have identified Kenya and Peru as South Africa's major rivals in the EU and UK avocados export markets. This is because both countries are in the Southern hemisphere region together with South Africa, as a result, they produce and supply avocados in these markets at the same time. Furthermore, these countries have been classified as the fastest-growing suppliers of avocados in the EU market, which is South Africa's top exporting destination. Kenya has also been identified as one of the fastest-growing avocado exporters globally.

The following strategies are proposed for this industry to be applied by the important actors in the South African avocado industry in order to increase its value chain's competitiveness and outperform its global rivals. Development of varieties which could be harvested and sold to the export markets at the different times as the Peruvian avocado industry (late-maturing varieties). The industry needs to fast-track the talk of opening new export markets for this industry, especially markets in the USA, China, Japan, and other African countries. SAAGA and the government need to be in talks with the logistics sector to establish efficient routes that this

industry could use to export this fruit more efficiently in the road and ocean while managing the cold chain properly. This will include making Durban and Port Elizabeth user-friendly for this industry to export the fruits rather than depending on the Cape Town port only.

A significant total amount of this fruit produced is marketed as fresh fruit. The industry could start by looking at the possibilities of creating various value-added products using this fruit. Products like avocado juice and/or cosmetic products can be produced from this fruit. This will add more activities and introduce new players in this value chain. Moreover, a major focus needs to be placed on the domestic market, as part of the industry trying to be globally competitive, it needs to take full advantage of the growing domestic market by creating various channels to market and supply this fruit locally. As it was indicated in the introduction, this fruit is only produced in very few regions in the countries and furthermore is very low volumes relative to the other fruits. Also in those regions, this fruit is produced at different times of the year. The has been a growing demand in a number of regions which do not produce this fruit and some of the regions they do not have NFPM or any other channels which the industry can use to supply these fruits. Therefore, as part of developing strategies to alleviate the issues which are faced by this industry in the export markets, the development of such channels will benefit the industry.

These recommendations for alleviating problems derived from this chapter will be presented in more details in Chapter 9.

CHAPTER 6: SWOT ANALYSIS OF THE SOUTH AFRICAN AVOCADO INDUSRTY

Abstract

SWOT analysis is a tool used to develop strategies, management planning, and analyse factors influencing the competitive position of an industry/firm. Recently the South African avocado industry has experienced a major decline in its position in the global exports markets and this decline is attributed to many factors, one of them being competitiveness. This study aims to conduct a detailed and more recent SWOT analysis for the South African avocado industry. This is done to identify the internal (strengths and weaknesses) and external (opportunities and threats) factors experienced by the participants in this industry, and analyse how these factors influence the competitive performance of this industry in the export markets. A qualitative research approach that involved relevant and recent literature analysis, and questionnaires sent to industry participants was used to collect data. This study was able to put forward a SWOT analysis at both industry and farm level for the South African avocado industry. Lack of economic and marketing research, one export destination, poor planning and inefficiencies associated with transportation and logistics, little government support, and high transportation costs were some of the factors were identified as negatively affecting this industry's competitive position in the EU markets. Four strategies were recommended with the aim of improving the competitive position of this industry.

Keywords: Actors, Avocado, Competitiveness, Global competitors, South Africa, Strategic, SWOT

6.1 Introduction

SWOT analysis is an analytical tool used by organizations for strategic planning and development (Wegren *et al.*, 2019). As part of a detailed competitiveness analysis study of the South African avocado value chain, a SWOT analysis will be conducted with an aim of identifying the Strengths, Weaknesses, Opportunities and Threats of the overall South African avocado value chain in order to develop industry level strategies that could be used to keep up with competition from global rivals. Furthermore, the findings of the analysis of this nature will serve as additional background information for the value chain analysis part (Chapter 8) of this overall study.

Value chains exist to strengthen the potential to take advantage of the opportunities in the operating environment, minimise unfavourable effects concerning several risks, and improve the competitive position of all participants (Savic *et al.*, 2016). However, for various reasons, a value chain may function sub-optimally, in which case value will be lost, its competitiveness will suffer, and the playing field not being equal to the detriment of, in particular, firms or actors that are not governing the chain (Mosoma, 2004). Consequently, continuous development of strategies by firms/industry is required to enhance the effectiveness, efficiency and competitiveness of the value chain.

SWOT analysis is a tool typically used for strategic planning and management by the organization, but it can also be used to build organizational strategies and competitive strategies (Gurel & Tat, 2017). SWOT analyses may be conducted at the level of the value chain in order to identify strengths and weaknesses in the supply chain and potential opportunities and threats. However, whether if it is conducted for an organisation or a value chain, it is only a tool that can be used in a planning process, and it must be informed by a sound understanding of the current situation and trends (Javanmard & Mahmoudi, 2008).

SWOT analysis, which has been described by Houben *et al.* (1999) as brainstorming key variables that affect a firm's/sector's performance, is undertaken using social science research methods, and the results are used to inform strategic and management planning (Helms & Nixon, 2010). According to Sica *et al.* (2015), SWOT analysis was devised for strategic positioning and advising business entities, but subsequently its applications have been extended to use in many other areas too of business. For example, Suwanmanueepong *et al.* (2018) used a SWOT analysis to develop marketing strategies that enabled the Nong Chock community in Bangkok to develop sustainable strategies for their agricultural products. SWOT analysis is a

commonly used framework in the business world for analysing the factors that influence a company's competitive position in the marketplace with an eye to the future (Rizzo & Kim, 2005).

Some of the advantages of conducting a SWOT analysis include;

- It encourages management to focus activities into areas of strength and where the greatest opportunities lie (Oladele & Sakagami, 2004);
- It can help researchers gain insight into the past and think of the possible solutions to existing or potential problems (Ommani, 2011);
- It requires the analyst to question the sector's competencies, resources, and capabilities to withstand external changes (Meyo & Lianga, 2012);
- It can improve evaluation and decision-making in various situations in which the system is, regardless of its type and complexity (Krasavac *et al.*, 2018);
- It assists with identifying and evaluating the essentials and environment of an organisation, corporation, venture or sector (Meyo & Lianga, 2012); and
- It promotes managerial awareness of the environmental changes, improved resource allocation decisions, risk management facilitation, it acts as an early warning system, and focuses management's attention on the primary influences on strategic change (Riston, 2011).

Despite the numerous possible benefits of conducting SWOT analyses identified above, and in spite being the mostly wide used as an analysis tool, SWOT analysis does have the important drawbacks including the following;

- It cannot go beyond making a definition regarding the current situation, and for this reason it should not be accepted as an analysis technique to inform organization strategy (Gurel & Tat ,2017);
- The method is prone to bias and is very different from testing the organization and experiencing the strengths at work (Weihrich, 1982); and
- It lacks a quantitative index that could be used as a comparison base amongst competing organizations (Suwanmaneepong *et al.*, 2018).

Considering the advantages and the disadvantages associated with the SWOT analysis, SWOT analysis could enrich the overall competitiveness analysis study the following;

- It will help to identify the areas of strengths in the South African avocado value chain that value chain participants can use as source of competitive advantage
- It will help to identify opportunities that exist in the South African avocado value chain and identity those opportunities that could be used by value chain participants to improve the overall competitiveness of this value chain
- Assist the researcher to gather further insights about the South African avocado value chain which could be used to develop strategic actions that may be used by value chain participants to enhance the overall competitiveness of the South African avocado value chain

The objective of conducting a SWOT analysis for the South African avocado industry in this study is to analyse the strengths, weaknesses, opportunities, threats and, current and future effects on the functioning and competitiveness of the industry. The findings of this analysis could help the South African avocado industry participants with strategies that could be used to take advantage of the strengths, counter the threats, and improve weaknesses. Implementation of such strategies could help to enhance the ability of the industry to keep up with the competition, especially in the export markets.

The next section provides a theoretical background on SWOT analysis and its different methodological procedures. Section 6.3 provides an overview of the methodology to be used in this chapter. The results of this chapter are presented in section 6.4. Conclusions are drawn in section 6.5.

6.2 Theoretical background on SWOT Analysis and its methodological procedures

The aim of this section is to present an overview of the peer-reviewed local and international economic literature on SWOT analysis and the various methods of conducting SWOT analyses. with the objectives of (a) identifying advantages associated with this analysis in terms of analysing competitiveness, and (b) identifying suitable methods for conducting a SWOT analysis of the South African avocado industry, taking into consideration the specific objectives of the analysis.

SWOT analysis divides the organization in a sense of two environments, i.e., external and internal environments (Figure 6.1) (Javanmard & Mahmoudi, 2008). Internal factors examine

the internal workings of the organization and these issues/items are usually within the control of the business owners or management (Zoller & Bruynis, 2007). These authors also defined external factors as outside factors that affects the organization, and owners or management do not have control over them but can manage them to enhance or reduce their impact on the organization. SWOT analysis is a simple yet powerful tool for sizing up an organization's resources capabilities and deficiencies, its market opportunities and the external threats to its future (Thompson *et al.*, 2007).

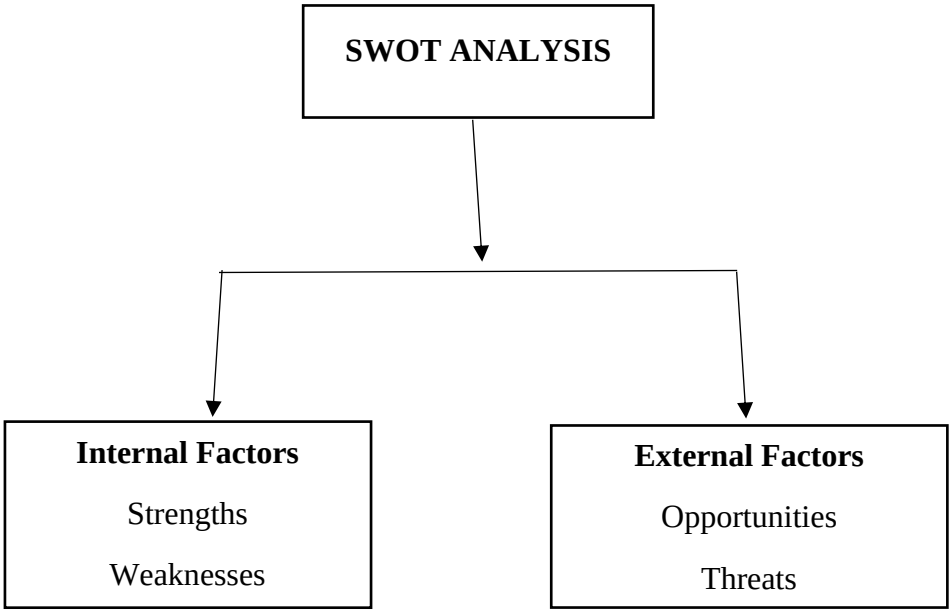

Figure 6.1: SWOT Analysis

Source: Gurel & Tat (2017)

SWOT analysis has four components which are Strengths, Weaknesses, Opportunities and Threats. The four components are operationalized as internal (strengths and weaknesses) and external (opportunity and threats) factors that are favourable or unfavourable for the organization to achieve its mission. Firms/organizations achieve strategic fit when the internal situation matches the external situation and the organization is well positioned to achieve and produce desired results (Kelsey, 2018). This technique is considered simple, yet effective mean to assess the current situation by analysing the four components (Ommani, 2011). Gurel & Tat (2017) defined each of the components as show below.

Organizational Strengths: Strength is the characteristic that adds value to something and makes it more special than others. Strength means that something is more advantageous when compared to something else. In this sense, strength refers to a positive, favourable and creative characteristic. Strength at organizational level involves properties and abilities by which an organization gains an advantage over other organizations and competitor organizations that are

revealed as a result of the analysis of its internal environment. In other words, organizational strength defines the characteristics and situations in which an organization is more effective and efficient compared to their competitors. An organization can be described as strong, equal or weak compared to their competitors based on five criteria: Relative market situation, relative financial structure, relative production and technical capacity, relative research and development potential, relative human capacity and management effectiveness (Gurel & Tat, 2017).

Organizational Weaknesses: Weakness refers to not having the form and competency necessary for something. Weakness means that something is more disadvantageous when compared to something else. In this regard, weakness is a characteristic that is negative and unfavourable. Weakness at organizational level refers to the situations in which the current existence and ability capacities of an organization are weaker compared to other organizations and competitor organizations. In other words, organization weakness means the aspects or activities in which an organization is less effective and efficient compared to its competitors. These aspects negatively affect the organizational performance and weakens the organization among its competitors. Consequently, the organization is not able to respond to a possible problem or opportunity, and cannot adapt to changes (Gurel & Tat, 2017).

Environmental Opportunities: Opportunity means a situation or condition suitable for an activity. Opportunity is an advantage and the driving force for an activity to take place. For this reason, it has a positive and favourable characteristic. For organizational managements, an opportunity is the convenient time or situation that the environment presents to the organization to achieve its goals. Opportunities are those that would yield positive results for the organization determined as a result of the analysis of its environment. Competition and the intense work present organizations big opportunities. In fact, opportunities are conditions in the external environment that allow an organization to take advantage of organizational strengths, overcome organizational weaknesses or neutralize environmental threats (Gurel & Tat, 2017).

Environmental Threats: Threat is a situation or condition that jeopardizes the actualization of an activity. It refers to a disadvantageous situation. For this reason, it has a negative characteristic that should be avoided. For organizational managements, a threat is the element that makes it difficult or impossible to reach the organizational goals. Threats are the situations that come out as a result of the changes in the distant or the immediate environment that would

prevent the organization from maintaining its existence or lose its superiority in competition, and that are not favourable for the organization. They can constitute an impediment to the success of the organization, and cause unrecoverable damages. All environmental factors that can impede organizational efficiency and effectiveness are threats (Gurel & Tat, 2017).

There are a number of methods which literature has revealed as methods of conducting a SWOT analysis. The literature indicates that SWOT analysis can be conducted using both qualitative and quantitative research approach methods. The most commonly used method of conducting a SWOT analysis involves a qualitative approach that uses document analysis which is followed by interviews or workshops as part of data collection. After gathering such information, a number of techniques can be used to analyse the data collected. A type of technique chosen is influenced by the objectives of the study. The qualitative approach has been used in SWOT analysis studies by King *et al.* (1994), Javanmard & Mahmoudi (2008), Meyo & Liang (2014), Arun & Ghimire (2018), Suwanmaneepong et al. (2018), and Wegren et al. (2019).

For example, Arun & Ghimire (2015) used nine different indicators to further analyse the strengths and the weaknesses which were identified during the qualitative approach in their study which was aiming at assessing the influencing factors of the Nepal national agriculture policy. Those indicators were 1) policy objective, 2) inclusiveness, 3) competitiveness, 4) cooperation, 5) modernization, 6) new concepts, 7) environment and sustainability, 8) monitoring and structure, and 9) policy option. Another study by Forleo & Palmieri (2019) which was aiming at identifying strengths, weaknesses, opportunities and threats of Educational Farms in Molise region, Italy, and key factors for setting a development strategy used a set of indicators to further analyse their qualitative data. The indicators were 1) farm's characteristics, 2) education activities, 3) networks, and 4) Institutions.

A study by Michailidis *et al.* (2015) employed a quantitative approach which was used in combination with a Delphi method in conducting a SWOT analysis in order to measure, in a scientific manner, the potential and pitfalls of treated wastewater reuse on European agriculture. During their study, they identified 200 strengths, weaknesses, opportunities and threats associated with the reuse of wastewater in European agriculture and they sent them (via email) out to industry stakeholder for further quantification using a nine-point Likert scale from 0 = strongly disagree to 9 = strongly agree. This was followed up by a focus group which comprised of key stakeholders made up of academics, policy directors, staff scientists, and

farmers to further analyse the findings. Another quantitative approach was used in study by Ommani (2011) which was aiming at using SWOT nalysis to identify strategies for agricultural development for wheat farmers of Shadervan District in Iran, especially in farming systems so that researchers or planners can help to recommend strategies for achieving food security. During this study, the researcher designed external and internal factors matrix, then analysed the SWOT matrix using the opinions of farmers, designed quantitative strategic programming matrix (QSPM) and lastly, strategies to improve these systems were recommended.

A study by Quezada *et al.* (2019) proposed a new SWOT analysis technique. This method measures and assesses the performance of a company for strategic management through the employment of a SWOT analysis combined with a quantitatively Balanced Scorecard (BSC). A BSC is a strategic measurement system which includes strategic objectives and performance indicators that are aligned with the mission and strategy of the organization (Quezada et al., 2019). These researchers were able to effectively apply this method to a company that belongs to the food industry. They concluded that this technique was useful but time consuming.

Formulating the right strategy at a right time and its subsequent implementation can help organizations to attract and retain a competitive advantage over rivals (Vanek *et al*., 2012). According to Ommani (2011), SWOT analysis provides a framework that could be used to prioritize business goals and to further identify the strategies of achieving them. SWOT is an analytical tool used by organizations for strategic planning and development (Wegren *et al.*, 2019). Many organizations or businesses carry out SWOT analysis at strategic planning, quality control while formulating government policies and legislations (Namugenyi *et al*., 2019). All of this is used by these establishments to create a competitive advantage that is better than their competitors. Organizations investigate a number of factors relevant to business alignments and strategies by employing SWOT analysis in different business scenarios Namugenyi *et al*., 2019). SWOT analysis can be conducted on farm or agribusiness value chain to better influence the competitiveness (Zoller & Bruynis, 2007).

Based on the literature reviewed, the commonly used technique of conducting a SWOT analysis is a qualitative approach which is carried out using interviews or questionnaires, and/or relevant document analysis. After gathering such information, a number of techniques/indicators can be used to further analyse the data collected. A type of technique chosen is influenced by the objectives of the study. Many studies have been able to use SWOT

analysis to develop competitive strategies. To achieve the aim of this chapter, SWOT analysis will be conducted through a use of questionnaire and document analysis.

6.3 Methods and Materials

This study utilized a qualitative research method approach. According to King *et al.* (1994), qualitative research includes a wide range of approaches, it tends to be focused on a single or small number of cases, which makes use of intensive interviews or in-depth analysis of historical material. For this analysis, the data was gathered using two techniques (adapted from Javanmard & Mahmoudi, 2008):

(1) Documentary studies: the study of documents, yearbooks, papers, private and public publications, and other available references; and

(2) Send out survey questionnaires (Appendix C, Questionnaire 1) to farmers, exporters, processors, specialists, experts, and professionals of the South African avocado industry. This was a census analysis involving all members (N= 409) of the SAAGA. 185 responses were received from this analysis which represents 45% response rate. Representing that response rate 82% was from producers and the remaining 18% was other actors in the South African avocado value chain who are SAAGA members.

Further analysis of the data will involve the evaluation of the findings of the SWOT against a number of indicators. The findings of the Strengths, weaknesses and Threats will be analysed on how these factors influences the competitiveness on the South African avocado value chain. Moreover, the opportunities which will be identified in this analysis would be used as part of developing strategies that could be used by the industry participants in order to improve the competitiveness of this industry.

6.4 Results and Discussion

The results of this analysis were presented as a SWOT framework using responses from SAAGA members. Those members consisted of producers, packhouses, exporters, input suppliers, and industry experts. Based on the responses received as part of this analysis, there was a clear indication between the factors that were applicable to producers only and those which were applicable to all the participants of this value chain. As a result of that, this study produced two SWOT matrixes, which apply at a farm level and industry level. In order for a factor to be identified as a Strength, Weakness, Opportunity and Threat, there had to be a clear consensus in the responses provided by the participants.

6.4.1 Industry Level SWOT Analysis

Industry level SWOT consist of all the factors which the was a clear consensus from all different value chain actors who participated in this study. .

6.4.1.1 Strengths

- Producing commercial – The industry is mainly made up of a number of commercial producers. These producers that produces commercially can be classified as large producers and commercially producing, packaging, processing, and marketing firms/producers
- Effective export marketing and advertising
- Strong value for crop – This fruit is perceived as having a much higher value compare with other fruits like apples and oranges
- Good quality fruit, credibility and consistent supply
- Development of rootstocks – The industry is constantly developing rootstocks that are resistant to different diseases and environmental conditions
- Well organized association – The industry falls under a well-organized structure which is the South African Avocado Growers' Association (SAAGA)
- Cold chain management – The industry manages it cold chain fairly effectively for both local and export markets
- Management of pests and diseases
- Solid technical research

6.4.1.2 Weaknesses

- One major export destination – The industry mainly exports their produce to the European Union (EU) markets
- Local marketing of the avocados – The industry value chain actors indicated that the industry has not been able to take full advantage of the growing local market
- Lower prices associated with the processing of the avocados
- Packhouse being the least profitable activity in the value chain
- Poor infrastructure at the harbors
- Attracting young entrants and training – Industry participants indicated that the industry has not been successful in attracting new graduates to be a part of this industry
- Lack of knowledge by small producers – Small producers have little knowledge when it comes to market information and administrations associated with accreditations.

- Lack of innovation in the industry
- Heavy alternative bearing
- Under supply of young trees - Nurseries under pressure resulting in sub-standard trees, long delays and backlogs in tree orders

6.4.1.3 Opportunities

- Organic and regenerative methods – Consumers are becoming more health-conscious about what they eat; hence the is a demand for organic avocados
- Access to new markets – The industry has an opportunity to enter into new markets like China, India, and the USA
- Recruitment of skilled labour – The participants indicated that the industry is in desperate need of skilled people
- Technologies to lower production costs
- Growing demand – The is an increase in demand for the fruit both locally and in various global markets
- Online and direct selling

6.4.1.4 Threats

- Global competitors having a more competitive advantage that the South African avocado industry
- Intense competition from global competitors on the South African avocado industry major export destination
- Lower local prices – This happens when the market is flooded with avocados from competitors
- Increased plantation of avocados by global rivals – Peru, Chile and Mexico which also compete with South Africa at the EU markets are expanding their operations at a greater rate
- Local and export transportation and logistics processes – This is caused by high transportation costs, poor roads and infrastructure, and the industry having to rely on one port
- Labour issues and audits (accreditations) obstacles
- High production costs
- Little government support

6.4.2 Farm-Level SWOT Analysis

Factors which were identified by South African avocado producers.

6.4.2.1 Strengths

- Reliable packaging facilities – These facilities are available in two forms. The first one is the one which involved the lending out traditional packhouses and the other one involves the lending out of packhouses from commercially producing, packaging, processing and marketing firms
- Availability of water resources
- Good and reliable storage facilities – Participants indicated that the availability of storing facilities throughout the seasons plays as an important strength
- High moral of employees – This is incentivized by actors in the form of employee rewards and bonuses
- High labour supply
- Climate and environment – Many of the producers are located in areas which have suitable climatic conditions for avocados and those areas have good soils
- Partnerships between producers to market fruit – This is when different producers come together to market their produce

6.4.2.2 Weaknesses

- High marketing and advertising costs
- Control over the supply chain – A limited number of actors are involved in the South African avocado value chain, producers indicated that as a result of that, they receive small income.
- Orchard replacement – Due to the shortage supply of trees, the is a small incentive among growers to replace underperforming orchards
- High level of on-farm avocado theft

6.4.2.3 Opportunities

- Direct supply of fruit – Creating channels that will enable producers to supply avocados directly to the markets, especially the local markets
- Value-added products
- Late cultivars – Development of late cultivars which will be supplied to the global markets later than major rivals mainly those located in the southern hemisphere region

6.4.2.4 Threats

- High input costs
- High production costs
- High labour costs
- New entrances
- Government policies – Government polices like minimum wages which makes labour expensive and land policies which cause uncertainties about land ownership were policies which participants deemed as a threat
- Accreditations (e.g., GlobalGap, SIZA, HACCP)

The factors which were identified both at the industry and farm levels were further analysed through engagements with SAAGA officials. During those engagements, a number of factors were identified as top factors that fall under Strengths, Weaknesses, Opportunities and Threats for the South African avocado value chain. Table 6.1 gives an overview summary of the SWOT analysis of the South African avocado industry which was developed after further consultations with SAAGA.

Table 6.1: SWOT – Matrix of South African avocado industry

Internal Factors	External Factors
Strengths	**Opportunities**
1. Excellent commercial production 2. Effective marketing and advertising of avocados 3. Well organized association 4. Proper chain management 5. Solid technical research 6. Proper and reliable packaging facilities 7. Available water resources 8. Good climatic and environmental conditions	1. Production of organic avocados 2. Access to new markets 3. Recruitment of skilled labour 4. Technologies to lower production costs 5. Growing local middle class that demand avocados 6. Online and direct from farm selling of avocados 7. Value-added products 8. Development of late cultivars
Weaknesses	**Threats**
1. One major export destination 2. Poor local marketing of avocados 3. High production costs 4. Inability to attract new talent 5. Lack of knowledge by small producers 6. Lack of innovation by the industry 7. Under supply of young trees	1. Intense competition from global rivals 2. Lower local prices 3. Increased plantation of avocados by global rivals 4. New entrances 5. High input costs 6. Exploitation of small producers by commercial producers 7. Government policies 8. Inefficient transportation and logistics processes 9. One major port for avocado exporters 10. Poor infrastructure at the port 11. High transportation costs

Source: Own processing

Factors such as higher transportation costs, one major export destination, higher production costs, poor local marketing, increased competition from global rivals are some of the major factors that has negatively impacted the competitiveness of this value chain. Alternative bearing, under supply of young trees, government policies, lack of innovation by the industry are some of the factors which were identified as major bottlenecks when it comes to the ability of this value chain to function more efficiently.

Based on the findings of this analysis, a SWOT Matrix (table 6.2) was developed for strategic actions that could be used by the important South African avocado value chain participants to improve on the weaknesses and threats that are existing on this value chain. Strategy one could be applied both at firm (producers and packhouses) and industry levels while strategies two, three and four are industry (SAAGA and government) based strategies. These recommendations for alleviating problems derived from this chapter will be presented in more details in Chapter 9.

Table 6.2: Overview of SWOT Analysis strategies for the South African avocado industry

Proposed Strategies and Objectives	Reference to a SWOT analysis
Strategy 1: Marketing strategies *Objectives:* • Identify new local supplying channels or markets • Access to new export markets • Creation of value-added products	S – Increased demand O – Access to new markets O - A growing local middle class that demand avocados W - Poor local marketing of avocados
Strategy 2: Mentorship programs *Objectives:* • Recruitment of qualified individuals to work in this industry • Mentoring of small producers by commercial producers	O - Recruitment of skilled labour T - Exploitation of small producers by commercial producers
Strategy 3: Research and Education *Objectives:* • Development of late-maturing avocado varieties • Enhance consumer awareness • Provide information for technical advice	S - Solid technical research O - Development of late cultivars W - Inability to attract new talent
Strategy 4: Transportation and logistics processes strategies *Objectives:* • Identify efficient routes to be used by exporters when exporting avocados from South Africa • Development of advanced cold chain for export markets	S - Proper and reliable packaging facilities W - One major port for avocado exporters W - Poor infrastructure at the port W - Inefficient transportation and logistics processes W - High transportation costs T - Government policies

Abbreviations: S = Strength, W = Weakness, O = Opportunity, T = Threat

6.5 Conclusion

This study which involved avocado industry actors who are members of SAAGA was able to identify all the strengths, weaknesses, opportunities and threats faced by the actors of this industry both at the industry and farm levels. In doing so, this study was able to put forward a more recent and much detailed SWOT analysis of the South African avocado industry. Since the industry has experienced a significant decline in its competitive position in the global export markets (as indicated in the previous chapter), this study identified a number of factors that the actors deemed to cause this decline. These factors are lack of economic and marketing research, the industry having one major export market, one major exporting port, lack of new market access, oversupply of avocados by global competitors in the industry's major export destination, failure by the industry to attract skilled new talent, little governmental support and poor transportation and logistics processes caused by poor road infrastructures, port management, and high transportation costs.

CHAPTER 7: ANALYSIS OF THE TRANSPORTATION AND LOGISTIC PROCESSES FOR THE SOUTH AFRICAN AVOCADO VALUE CHAIN

Abstract

The South African avocado industry is export-oriented, with its biggest markets being the EU and the UK markets. Due to the significant contributions in terms of economic returns, the supplying of avocados to the export markets has on this industry, and the country's GDP. Moreover, considering the higher levels of competition this industry has been experiencing from its global rivals which are Peru and Mexico, there is a greater need to transport this commodity with fewer rejections, less inefficiencies, and damages to the quality.

The aim of this study is to analyse the domestic and export transportation and logistics processes, and measure the logistics trade quality performance of the South African avocado value chain. To achieve this, this study employed three part analyses which are made up of qualitative and quantitative research approaches. The findings of this study suggested that the competitiveness of the South African avocado value chain is being negatively affected by the transportation and the logistics processes which are responsible for moving this fruit from producers to consumers, especially those in the export markets. This study was able to recommend three major strategies that industry participants could use to improve the competitiveness of this value chain.

Keywords: Avocado, Competitiveness, Exports, Logistics, Transport

7.1 Introduction

Fliehr (2013) noted that long distances between production sites and domestic destinations require a high participation of the transportation and logistics services within the value chain. In South Africa, the distance from the avocado production sites (predominantly in Mpumalanga and Limpopo) are relatively distant from the seaports. For example, the main seaport used for South African avocado exports is the Cape Town Port, which is approximately 1800-2000 km from production regions. There used to be a specialised avocado train that ran to Cape Town weekly with only avocados, but this stopped after some trains of avocados missed the sailing of the weekly vessels, resulting in a general perception amongst growers that Spoornet was "not reliable" and consequently reduced the demand for the service (Bard, 2020).

Due to the significant contributions the supplying of avocados to the export markets has in terms of economic returns for industry participants, the GDP of the country, and considering the higher level of competition this industry has been experiencing from its global rivals (as shown in Chapter 5), there is a greater need to transport this commodity with few rejections, and less inefficiencies and damages to the fruit quality. All of this is possible through having an understanding of all the factors that have a negative effect on the competitiveness of the South African avocado industry as a result of the transportation and logistics processes. This kind of information will be useful in developing effective strategies for improving the competitiveness of this value chain, especially in relation to the exporting of this fruit.

According to Bulgurcu & Nakiboglu (2018), logistics is one of the most important components of the value chain that has a significant influence on the success, efficiency and cost of the entire chain. A study conducted by the NAMC (2017b) which was looking at "the role of transport in logistics of agriculture" with an aim of identifying and defining the key transport costs drivers in South Africa with impact on agricultural logistics, with the focus on rail transportation was conducted. The study concluded with, if agricultural logistics were to succeed in gaining cost improvements and better efficiencies, that will be essential to meet future agricultural production, there is a need to initiate and pursue engagement with Transnet and relevant government departments to complete and commission the major rail corridors as soon as possible.

For a number of industries in South Africa, the largest cost component of the total costs has always been transporting costs (Council for Scientific and Industrial Research (CSIR), 2013). According to Farmer's Weekly (2015), the cost of transport has become a great burden for

South African producers. This agricultural news outlet further stated that, for smallholder producers, transport has caused a make-or-break facet of production that has a major influence on diminishing margin returns. An illustration of the transport costs was given using ZZ2, which is one of the largest agribusiness firms in South Africa, which produces tomatoes, avocados, apples and stone fruits amongst other things, their report on transportation cost revealed that its transport costs as a percentage of total costs had increased by 6,3% since 2004. In that year (2004), transport made up 2% of the company's total cost, rose to 4% in 2010 and was 8,3% in 2015.

This chapter aims to analyse the domestic and export transportation and logistics processes of the South African avocado value chain, and measure the logistics trade quality performance of this industry and compare it with that of the industry's major global rivals which are Mexico, Peru, Israel, Kenya, and Spain. The information obtained from this analysis would be used to develop and recommend strategic actions for the South African avocado value chain actors, especially exporters and agribusiness managers, which they could use for the shipment of avocados from the farm to port and to markets (both local and international) in a more efficient manner. This efficient movement would result in an improved competitiveness, especially in export markets. Information of this nature could also be useful for Transnet and the department of transport in knowing the effects that transportation and logistics have on this industry and what need to be done to alleviate the issues associated with transport and logistics. Dewberry (2020) noted that the main benefits of improving trade logistics were market expansion, increased competitiveness, enhanced ability to leverage off economies of scale and increased specialisation.

To achieve the objective of this analysis presented in this chapter, the following questions will be addressed:

- *What are the challenges and potentials of the South African transport sector for avocado exports?*
- *How are the costs and the efficiency of the logistics and transportation processes influencing the competitiveness of the South Africa avocado industry*?
- *How do the logistics trade quality of South Africa compare with that of its global rivals in avocado global export markets?*

The next section provides a short overview of the peer-reviewed local and international economic literature on the transportation and logistics processes for the agricultural industry

and their impact on the functioning and the competitiveness on this industry. Section 7.3 provides an overview of the methodology to be used in this study. The results of the measurement and the analysis of the transportation and logistics processes of the South African avocado industry are presented in section 7.4. Conclusions are drawn in section 7.5.

7.2 Transportation and logistics processes for the agricultural industry and their impact on the functioning and the competitiveness on this industry

The aim of this section is to present an overview of the peer-reviewed local and international economic literature on transportation and logistics processes for the agricultural industry and their impact on the functioning and the competitiveness on this industry. This is done with an aim of trying to understand the current state of the transportation and logistics processes for the South African agricultural industry and use that information as a baseline in trying to achieve the objective of this chapter.

Various stakeholders such as farmers, vendors/agents, wholesalers, rural retailers, suppliers, and transportation companies are involved in the agricultural food and agribusiness value chains (Bosona, 2011). Their interest in these value chains is that to deliver high-quality produce at the right time in the right quantity to the right consumer at the minimum cost to satisfy the consumers (Ballou, 2007). However, the quality of the produce, especially in supply chains of relatively perishable products, is highly depended on the conditions and the management of the transportation processes (Cook *et al.*, 2011). Organizations are shifting their focus on delivering customer value through logistics as a means of remaining competitive (Mentzer *et al.*, 2001; Esper *et al.*, 2007). The costs and the overall functioning of the transportation industry have a significant contribution to the produce's final price (Raut & Gardas, 2017).

According to Wong & Karia (2019), the logistic industry was recognized as a new industry in the late 1980s. Since that time, it has been experiencing significant levels of growth but not all logistics service providers are competitive (Wong & Karia, 2019). Logistics is defined as “a process of planning, implementing and controlling procedures for the efficient and effective transportation and storage of goods including services and related information from the point of origin to the point of consumption for the purpose of conforming to the customer’s requirements” (Council of Supply Chain Management Professionals, 2020). To achieve sustainable competitive advantage, the logistic industry needs more theories and practical solutions (Wong & Karia, 2019). The logistic industry is faced with changing customer

expectations, technological breakthroughs, new entrants to the industry, and new ways to compete or collaborate as key disrupting factors (PwC, 2016). According to this publication, these disruptions have very different implications for individual companies, depending on which segments they operate in, their type of ownership, and their location. "Increasing variety of goods, the just-in-time, delivery systems, low load rate, specialization and centralization of production systems, globalization of marketing and seasonal variations are amongst the main challenges of logistics system which may lead to the necessity of developing effective logistics in the agricultural sector" (Gebresenbet & Bosona, 2012; Page 127).

In a dynamic business environment, the most successful companies in terms of growth and profitability are those who are able to manage their logistics processes and evolve their logistic management practices over time (Abrahamsson *et al.*, 2003). Transportation and distribution are regarded as one of the most critical determinants of business success (Granillo-Macias *et al.*, 2018). Organizations are faced with many challenges as they strive to compete in today's dynamic global markets (Sabry, 2015). "To remain competitive, organizations must recognize the importance of value chain practices that not only improve their own performance but also create value by means of optimizing customer satisfaction and helping to significantly improve the overall performance of a business" (Cook *et al.*, 2011; Page 120). A study conducted by Sandberg & Abrahamsson (2012) which was looking at the logistic capabilities for sustainable competitive advantage concluded that sustainable competitive advantage is achieved through a combination of efficient and effective logistic operations and a well-functioning, adjusted, in-house IT systems. These authors further identified five factors which are responsible for assuring that sustainable competitiveness is achieved and maintained, these factors are managerial knowledge and presence, cross-functional teamwork, control, learning and supply chain relationships.

A study which was carried out by Langley & Capgemin (2007), showed that many users were dissatisfied with services provided by their logistics service providers. In the same study, the researchers reported that many logistics service providers failed to deliver expected costs reduction, trustworthy relationships, and increasing needs for a wider portfolio of logistics services, geographical coverage, and advanced information technology. Logistics is a key factor that contributes mainly to the financial positioning of a company through the balance between performance and cost (Granillo-Macias *et al*., 2018). Granillo-Macias *et al*. (2018) contend that the relationship between logistics costs and business strategies plays an important role in business planning, mainly influencing new competitive strategies.

Since the agricultural value chains involve raw materials and products with sell-by dates, some agricultural chains involve living organisms in the initial links of their chain; this sector is a logistic challenge (Wajszczuk, 2016). The growing complexity of logistics and its importance as a major economic activity has raised the profile of information and communication technology to improve the levels of visibility, responsiveness, and efficiency in supply chains relying on multimodal transport operations (Mondragon *et al.*, 2012). A study by Raut & Gardas (2017) identified these factors as the factors that affect the sustainable transportation process in the fruit and vegetable value chain: Improper/Lack of packaging, improper handling of packed produce while loading and unloading the fruits and vegetables, non-availability of refrigerated vehicles, packages getting exposed to the sun and rain while loading and unloading, poor storage, a stack of packages too high, close storing pattern of the packages, the vibration of the vehicle, rash driving, bad conditions of the road, absence of radiation shield on top of the vehicle and excessive loading on the vehicle.

In the agricultural industry, globalization of food production has considerably influenced the food supply chain system by an increasing distance the food has to be transported to reach the consumers (Bosona, 2011), as a result of this strategic management of the supply chain, becomes a vital factor. Successful economic integration and poverty alleviation in Africa will remain linked to the liberalisation of the trade in agricultural goods (Cissokho *et al.*, 2012). Studies by Limão & Venables (2001), Portugal-Perez & Wilson (2012), Takele (2019) and Jordaan (2014) have been able to demonstrate that efficient trade logistics can stimulate trade between different countries. "International logistics is a fundamental element of the global economy, with its promoted importance by the growth of the amount of freight being traded as well as a great variety of origins and destination" (Candemir & Celebi, 2017; Page 4695). According to Tanoino *et al.* (2019), it is highly important to consolidate all the transport sectors into a single multimodal system, which would be useful in terms of customer serving, shipment time and accuracy, cargo safety, end-to-end information support, and financial support relationships. Like individual consumers, industrial consumers expect to get shipments faster, more flexible, and with more transparency at lower prices (PwC, 2016).

Mangan *et al.* (2008) stated that there are five modes of transports used to transport goods: road, rail, water, air, and pipeline transport. They argued that driven speed and the geographical locations of the transport's origin and domestic destination are the key factors for the selection of the transport to be used since distance and time directly influence transportation costs and reliability of supply. These authors when further to state that, transport medium cost, speed,

flexibility, local access and available capacities as factors which are put into consideration when choosing a mode of transport in order to ensure efficiency in the logistic process with minimization of breakdowns and costs. Elevated logistics costs due to longer distance transportation of goods reduces the price received by producers in remote production areas (Fliehr, 2013). Through the past decade, the largest cost component of total costs in the value chains has always been transporting costs as shown in figure 7.1(Council for Scientific and Industrial Research, 2013). Even though these costs tend to be industry specific, this figure is used to illustrate the important role of the transportation and logistics in many of the industries in South Africa.

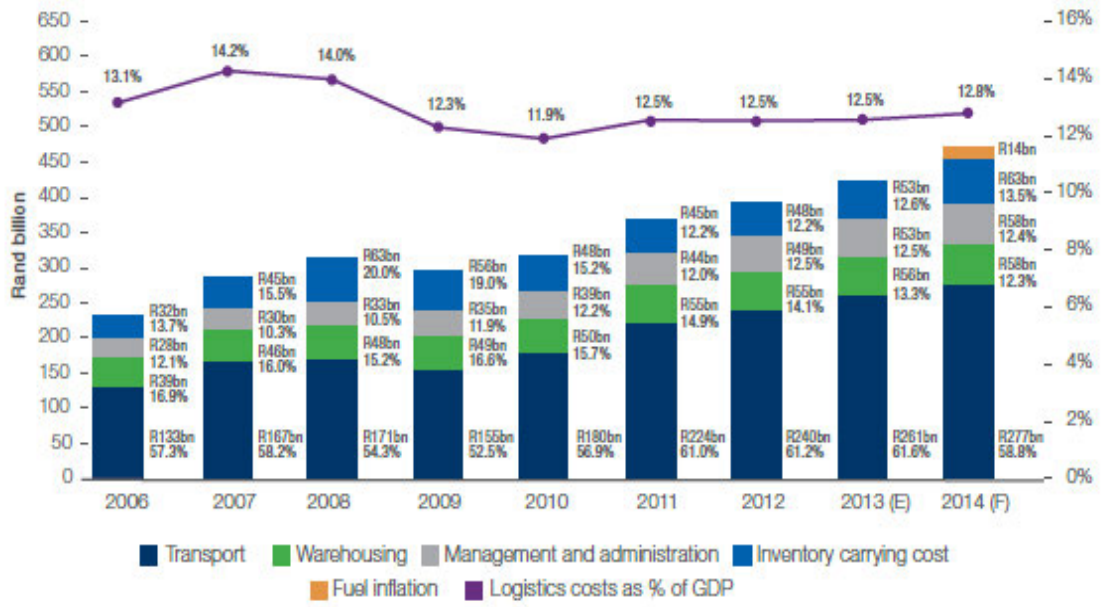

Figure 7.1: South African total national logistics costs and their components from 2006-2014
Source: Council for Scientific and Industrial Research (2013)

In conclusion, logistics play an important role in the functioning and the competitiveness of agricultural and agribusiness value chains. The quality of produce, especially in value chains of relatively perishable products, is highly depended on the conditions and the management of the logistics and transportation processes. Also, the costs and the overall functioning of the transportation industry have a significant contribution to the produce's final price.

Based on the literature, the transport sector is very important for the competitiveness of other industries, especially if it is well functioning. For the agricultural industry, the transport and logistics part, plays a vital role in ensuring that the produce reaches the consumers at a required time. If it is not well functioning for this industry, it may result in poor quality supply which

can affect the competitiveness, especially when supplying to export markets. Various studies in both local and international levels have been able to demonstrate that efficient transportation and logistics could result in lower transportation costs for industries using them, and improve competitiveness for them as well.

7.3 Methods and Materials

This analysis has three parts. The first two parts involves the use of qualitative research approach and the last one uses quantitative research approach:

- Part 1 involved a census survey of the South African avocado exporters who are SAAGA members using a combination of structured and unstructured questions.
- Part 2 involved a survey of Port Managers and Harbourmasters of the five major seaports in South Africa (*Durban RoRo, Maydon Wharf and Agric-Bulk Terminal*, *Port Elizabeth Terminal*, *Cape Town Port* and *East London Terminal),* also using a combination of structured and unstructured questions. The sample was selected by way of a deliberate sampling of the major seaports in the country which deals with various fruits that are sold to international markets.
- Part 3 involved the use of indices to measure trade logistics quality of a country. The aim of this part was to measure and compare the trade logistics quality of the South Africa avocado industry with those of its major global rivals in the export markets.

7.3.1 Factors affecting the competitiveness of the South African avocado industry as a result of the transportation and logistics processes

In order to safeguard supply and allow competitive prices for South African avocado exporters, transportation and logistics processes are some of the key factors that the South African avocado industry will need to address in order to improve the overall competitiveness of the South African avocado value chain. The first part of the analysis in this chapter was conducted using a census study of 25 South African avocado exporters who are SAAGA members. The second part involved a deliberate sampling of the major seaports in the country which deals with various fruits that are sold to the international markets. These two parts were used to identify factors which are negatively affecting the competitiveness of the South African avocado value chain using information from exporters and port officials. The information with regards to the influence of the transportation and logistics processes on the competitiveness of the South African avocado value chain was gathered using survey Questionnaire 2 (Appendix C). This survey was conducted using Survey Monkey. Furthermore, a Likert scale will be

employed in order to analyse how do different value chain value chain actors view the factors which are affecting the competitiveness of this value chain as a result of the transportation and logistics processes responsible for the movement of this fruit from producers until consumers.

7.3.2 Measuring Trade Logistics Quality

The following methods and indices were used to measure and compare trade logistics quality for the South African avocado industry with those of its global rivals in the export markets which are Mexico, Peru, Israel, Kenya, and Spain. These indices will be based on the recent available data pre Covid-19.

7.3.2.1 Global Competitiveness Index 4.0

According to Dewberry (2020), the World Economic Forum produces an annual Global Competitiveness Report which ranks and scores countries on various criteria. The Global Competitiveness Report is designed to help policy-makers, business leaders and other stakeholders shape their economic strategies in the era of the Fourth Industrial Revolution Schwab (2019). This report uses the Global Competitiveness Index (GCI) 4.0 to evaluates the national competitiveness of 140 economies and provides insight into the drivers of economic growth. The GCI 4.0 framework is made up of 12 main drivers of productivity pillars which are used to evaluate competitiveness, those pillars are:

1. Institutions
2. Infrastructure
3. ICT Adoption
4. Macroeconomic Stability
5. Health
6. Skills
7. Product Market
8. Labour Market
9. Financial System
10. Market Size
11. Business Dynamism
12. Innovation Capability

Pillars 1-4 make up the "enabling environment", 5-6 "human capital", 7-10 "markets", and 11-12 "the innovation ecosystem". The higher a country or region's score the better its rating in terms of competitiveness for that pillar (Dewberry, 2020). The Global Competitiveness Index identifies and assesses the factors that underpin the process of economic growth and human development (Schwab, 2018). It highlights the necessity of addressing the spillover effects and externalities, positive and negative, intended or unintended, of a policy or strategy beyond the direct objective it pursues. The GCI encourages the application of systems thinking, an approach that leaders must adopt in order to apprehend and address today's complex global challenges (Schwab, 2019).

7.3.2.2 Logistics Performance Index

The World Bank's international Logistics Performance Index (LPI) is a biennially produced global benchmark for over 160 countries. The LPI analyses differences between countries in terms of customs procedures, logistics costs and the quality of the infrastructure for overland and maritime transport (Mart *et al.*, 2014). This index is comprised of 6 indicators:

1. The efficiency of customs and border management clearance
2. The quality of trade and transport related infrastructure
3. The ease of arranging competitively priced international shipments
4. The competence and quality of logistics services
5. The ability to track and trace consignments
6. The frequency with which shipments reach consignees within the scheduled delivery time

The LPI data is gathered from surveys completed by logistics practitioners and the final international LPI score of 1 to 5 that is given to a country is the weighted average of the six indicators (Arvis *et al.*, 2018). According to Dewberry (2020), countries can be categorised based on their score as: logistics unfriendly, partial performers, consistent performers or logistics friendly. There is a gap between low income and high-income countries' LPI scores but income is not the only factor that influences a country's LPI, which is evidenced by the fact that LPI scores can vary vastly amongst income group peers (Arvis *et al.*, 2018).

7.3.2.3 The World Bank's Ease of Doing Business: Trading across borders

The World Bank produces an annual report that measure and scores the 'Ease of Doing Business' for each country. The distance from frontier method is used, and each country's score is calculated by combining measures of different units such as the amount of 'time to start a company' or the 'procedures to transfer a property, which are representative of how easy it is to do business in a given country (The World Bank, 2019).

7.4 Results and Discussion

7.4.1 Transportation and Logistics: Exporters

A total of 16 exporters (64% response rate) responded to the questionnaires for this analysis. The respondents included large producers, commercially producing, packaging, processing and marketing avocado firms, packhouses, and avocado traders who specialises with the exporting of this fruit. The participants indicated that avocados in South Africa are shipped in two different ways for the two main markets. For the local markets, the avocados are transported

around the country through various channels as shown in figure 7.2. For these markets, avocados are transported mainly through the use of road transportation. Participants revealed that in some instances air transportation is used to ship the avocados from one province to another (mainly the Ripe and Ready avocados). For the local situation, the avocados are transported in various channels which makes it risky in terms of managing the fruit quality, avoiding losses, staying competitive and selling the fruit at a good price. Players need to have strategies which enables them to supply avocados to a specific channel, at a right time with a right price. Therefore, strategic development and management are the key factors in being a successful player who participant in the shipment of avocados for the local markets.

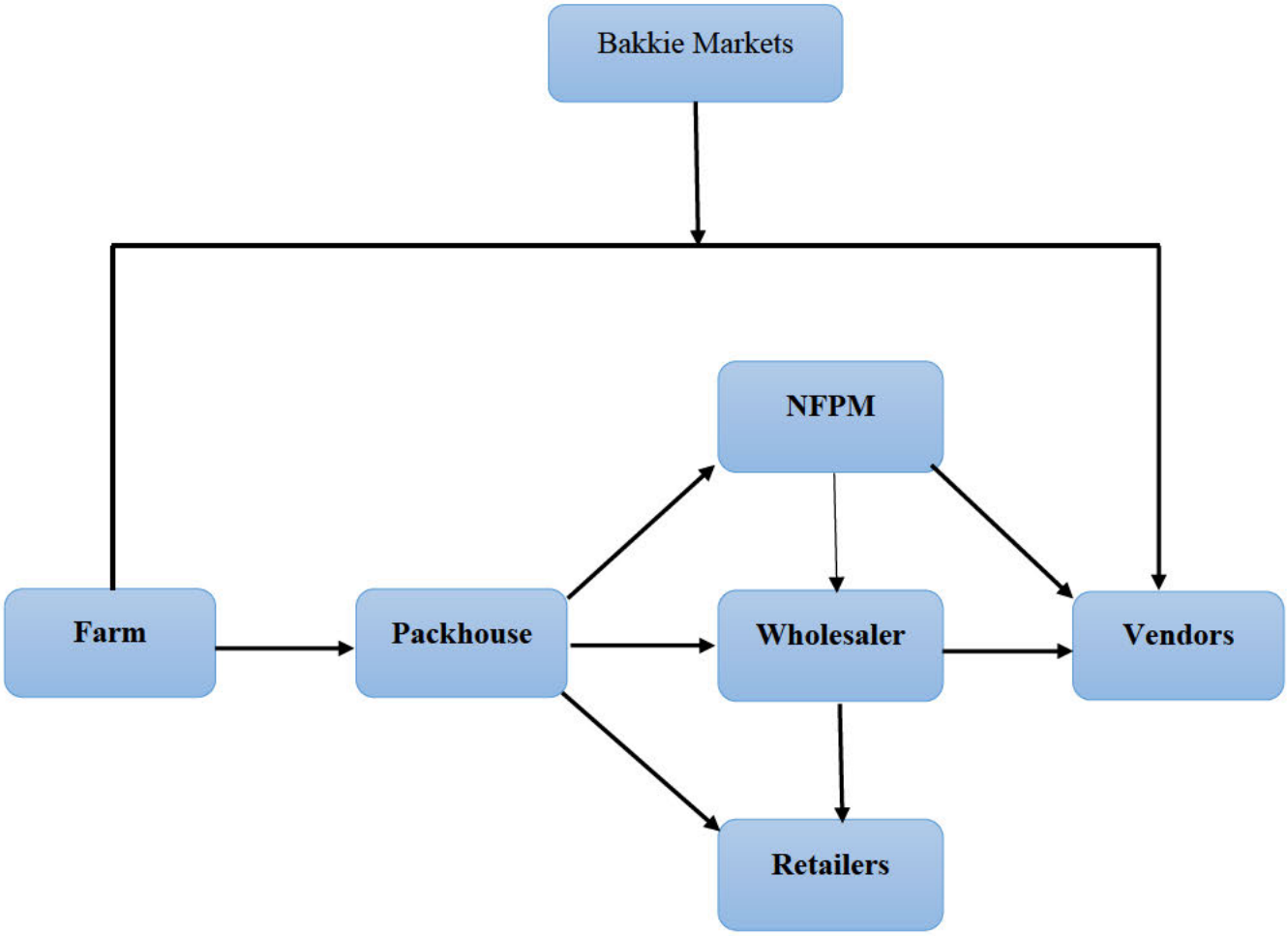

Figure 7.2: Movement of South African avocado supplied in the local markets

Source: Own processing of the data from SAAGA exporters survey (2021)

The movement of the avocados from South Africa to export markets is shown in figure 7.3. South African avocado exporters described the export process as being influenced by and being highly dependent on the farming practices of producers. Farming practices are influence by the consumer requirement in the export markets and farm accreditations like SIZA, HACCP,

GlobalGap, etc. These accreditations are used to ensure that the consumer requirements are met by producers. Direct from the field, avocados get transported to the packhouses. After packing, cooling, and inspection, avocado pallets are containerized and trucked as soon as practically possible to the ports, mainly the Cape Town port. The avocados receive additional inspections at the packhouses, port and export markets. The distance travelled from the packhouses to the port is about 1800-2000 km, and this usually takes about 24 hours, including loading, traveling, and unloading. Upon arrival, it is kept at port and loaded on the ship as scheduled. Traveling time from harvest to shipping usually takes about 8 - 10 days. When it comes to supplying avocados to the export market, effective movement of the fruit and efficiency from all stakeholders involved is required in order to successful supply this fruit into these markets.

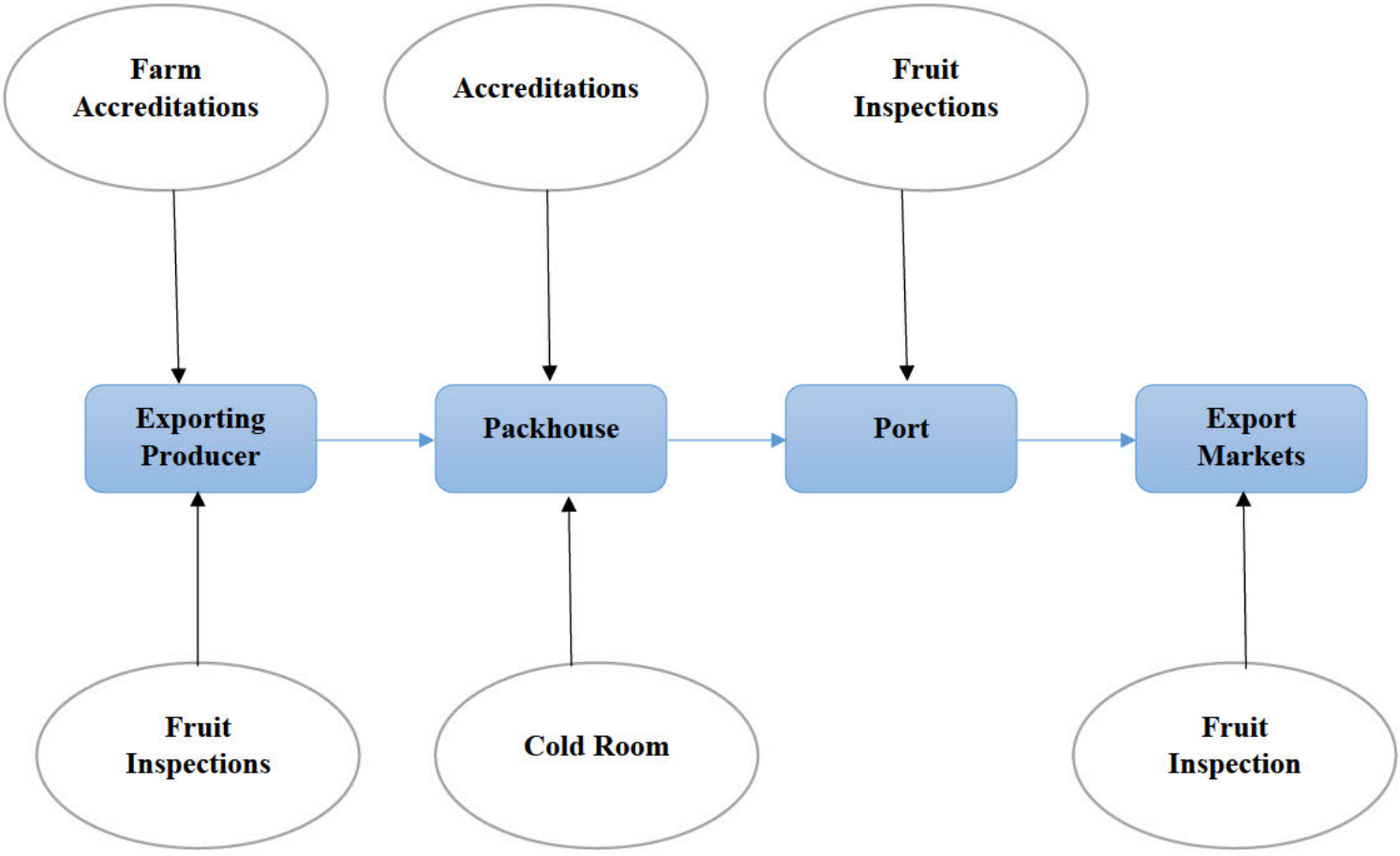

Figure 7.3: Movement of South African avocado supplied in the export markets

Source: Own processing of the data from SAAGA exporters survey (2021)

The national highways were described as currently being sufficient and in good condition for the transportation of goods across the country. On the other hand, secondary roads were generally described as challenging, a cause of increased transactions costs and a significant contributing factor to some major delays for the avocado exporters. Congestion at weighbridges was also identified as a factor contributing to the delays. Although these delays do not result in any fruit losses, but they can have a detrimental impact on the quality of the fruit, which could result in claims and rejections by consumers in the export markets.

Avocados are commonly transported by sea to export markets. Transportation of fresh produce by sea can contribute to losses because "[various] core factors along with varying temperature levels become a source of problems which lead to damage and/or loss of precious cargo" (Uygun & Jafri, 2020; Page 2). Exporters indicated that the seaports are associated with port inefficiencies, poor infrastructure and poor management. The perception was that this was as a result of the ports being owned by the state.

Through early consultations with key informants and SAAGA officials, 18 factors were identified as factors which are negatively affect the competitiveness of the South African avocado value chain as a result of the transportation and logistics processes. Though the census part of this analysis which involved exporters who are SAAGA members, an additional six factors were identified. In total, 24 factors were identified as affecting the transportation and the logistics processes of the South African avocado value chain, which impact the overall competitiveness of this value chain. Exporters were asked to rank the 24 factors in a manner in which they viewed them with regards to how they affect the competitiveness of this value chain using a five-point Likert scale, where **1=No Obstacle, 2= Minor Obstacle, 3= Moderate Obstacle, 4= Major Obstacle, and 5= Very Severe Obstacle.**

These factors were grouped further into three major constraints for the South African avocado chain, and these constraints were infrastructure problems (table 7.1), Transportation Costs drivers (table 7.2) and regulations problems (table 7.3). Each group consist of factors which have a number of similarities with each other. For example, transportation cost drivers constraints all contribute the overall costs of transporting this commodity.

South African avocado exporters identified input costs as the biggest transport and logistics cost driver. Infrastructure issues (table 7.1) were highlighted as one of the major constraints negatively affecting the competitiveness of the South African avocado value chain. Transport infrastructure matters for all actors in the value chain (The World Bank Group, 2015).

Inadequate transport infrastructure and services in rural areas push up marketing costs, undermining both local and international markets (The World Bank Development Report, 2008). The authors further stated that small-scale producers who tend to be geographically dispersed face large obstacles due to the lack of good quality infrastructure and efficient transport, limiting them from obtaining essential inputs and getting their produce to the market. When these producers try to access transport, their transportation costs are very high, limiting their competitiveness and ability to participate in the agricultural value chain. The transportation infrastructure of a nation reflects its resource availability and commitment to efficient and effective logistics execution (Goldbsy, 2000).

Table 7.1: Infrastructure constraints affecting the competitiveness of the South African avocado export value chain

Infrastructure Constraints	Number of respondents	Range	Mean	Standard Deviation
Restrictions on period of time entering in large cities	16	1-4	2.2	0.83
Congestions around major cities	16	2-4	2.9	0.68
Congestion on main roads	16	2-5	3.1	1.12
Poor road condition	16	2-4	2.4	0.81
Missing links in the road	16	1-3	2.2	0.83

Source: Own processing of the data from SAAGA exporter's survey (2021)

Transportation cost drivers (table 7.2) were identified as the major constraint negatively affecting the competitiveness of the South African avocado industry in relation to transportation and logistics processes. According to Stepien *et al.* (2016), logistics costs include the costs associated with the processes of transportation and distribution, packaging, material handling, inventory maintenance, transportation management and storage, loading and unloading, management of information, and communication. Tax rates, tax administration, corruption and roadblocks, fuel costs and transportation costs were the major factors identified by this analysis to contribute to higher input costs. A study conducted by Van der Vorst *et al.* (2009) revealed that costs associated with transportation are the ones with the greatest contribution in the structure of logistics costs and that they have a major impact on the competitiveness of the agri-food supply value chain actors.

Table 7.2: Factors affecting the costs for the transportation and the logistics processes for the South Africa avocado industry

Transportation Costs Drivers	Number of respondents	Range	Mean	Standard Deviation
Tax administration	16	3-5	4.5	0.82
Tax rates	16	3-5	4.7	0.60
Crime and Security	16	2-5	3.8	0.86
Corruption and roadblocks	16	3-5	4.3	0.77
Road accidents	16	1-5	3.3	1.13
Lack of backload	15	2-4	2.9	0.74
Labour costs	16	2-5	3.3	1.23
Fuel costs	16	3-5	4.4	0.62
Costs of maintenance and spare parts	16	1-4	2.8	0.77
Costs of transport	16	2-5	4.0	1.06

Source: own processing of the data from SAAGA exporter's survey (2021)

Regulation problems (table 7.3) were identified by this analysis as not having too much negative effect on the competitiveness of this value chain. The factors which are under this constraint, most of them are not controlled or determined by the actors in this value chain. For most respondents, there was some level of consensus about the effect of most of the factors except for Phytosanitary regulation, and Regulations and licenses.

Table 7.3: Regulation problems affecting the transport and logistic processes for the South Africa avocado export chain

Regulation Problems	Number of respondents	Range	Mean	Standard Deviation
Health problems of drivers	16	1-4	2.8	1.00
Inadequately trained work force	16	1-3	1.6	0.72
Labour problems	16	1-4	2.7	1.08
Phytosanitary regulation	16	1-5	2.8	1.48
Stopping time for inspection	16	1-4	3.1	0.81
Practices of competitors in the informal sector	16	1-4	2.4	0.89
Border-crossings	16	1-3	1.8	0.75
Freight allocation	16	1-4	2.1	0.85
Regulations and licenses	16	2-5	3.3	1.01

Source: Own processing of the data from SAAGA exporter's survey (2021)

South African avocado exporters revealed that it is not common practice to find farmers, packhouses, or exporters owning their own transport that is used to transport avocados from farm to packhouse and packhouse to ports. This was due to the fact that the opportunity costs of owning such transportation are very high. The participants revealed that most of the industry players outsource transportation and logistics services involve in the shipment of avocados for both markets to an external firm(s). The literature has identified a number of advantages which are associated with outsourcing which are: a) outsourcing creates value from an expert firm on the chosen area (Liou *et al.*, 2011) and b) outsourcing helps firms to reduce operating costs and improve competitiveness (Uygun *et al.*, 2015).

For this analysis, transportation costs were identified as one of the major constraints by the South African avocado exporters. For most of the factors that were identified and analysed in this part, the was no clear consensus with regards to the effect of these factors. This could be attributed to many factors which include experience of the exporters, type of the exporter, road shipment routes used by exporters, production site/packhouse location, and perceptions about what the kind of services expected from the government.

7.4.2 Transportation and Logistics: Ports

Port performance can be measured based on infrastructure, landside transport connections, vessel connectivity, operations performance (efficiency of handling containers), and

import/export processing efficiency (government instituted customs processes) (Botes *et al.*, 2018). During this part of the analysis, another 24 factors were identified by South African avocado exporters as factors that are constraining their competitiveness, and these factors were identified as being as a result of the functioning and management of the ports. These factors were then sent out to the South African biggest seaports for analysis. During that analysis, ports were made aware that South African avocado exporters identified these factors, and ports were given a chance to rate the factors in a manner in which they need to be addressed by the ports in order to promote the competitiveness of the South African avocado industry especially when it comes to exporting this fruit from South Africa to export markets. Ports were given a chance to rate these factors using a 7-point Likert scale, with **1=less attention**, **4=neutral** and **7=more attention**.

Results of this analysis are shown in figure 7.4. The results show a clear consensus between exporters and ports officials regarding the factors affecting the competitiveness of this industry which are as a result of the functioning and the management of the ports. This is supported by the fact that exporters identified these factors as constraining and the ports indicating that indeed more attention is needed in addressing these factors with an aim of promoting the competitiveness of this industry. Also, ports that participated in these studies revealed that addressing these factors will not only help the avocado industry and but all the fruit industries that are exporting their produce from South Africa to the other parts of the world using these seaports. Factors which were identified by the ports as needing more attention with regards to being addressed in order to promote the competitiveness of this value chain are port marketing strategies and approaches, computerized maintenance systems, clear policies and procedures regarding some of the ports systems, strategic planning, management of port security, and container terminal operations.

Furthermore, this analysis also revealed that the Cape Town port is the main port that avocado exporters use to export this fruit from South Africa to export markets. The Durban port indicated that once in a while it does receive avocados which eventually have to go through the Cape Town port then after that to the respective export markets. Exporters, especially those from KwaZulu-Natal, indicated that if they have fruits that have a higher moisture content, they transport them to the export markets using Durban port. Using other ports is not a common practice for this industry, since it mainly exports to Europe and trips which are going to Europe from South Africa, go through the Cape Town port. Because of that, exporters have settled for using the Cape Town port.

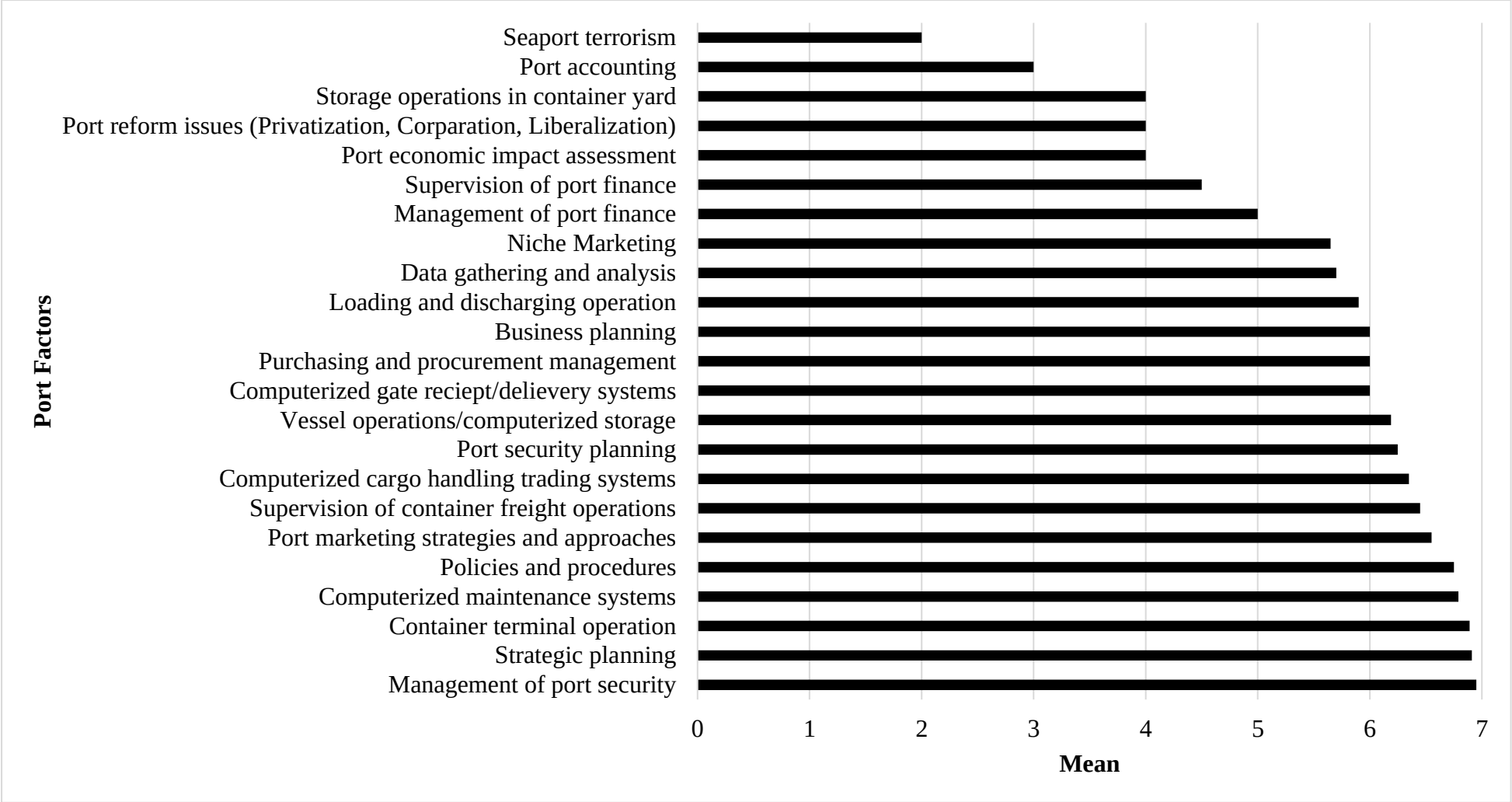

Figure 7.4: Port logistical and non-logistical factors influencing the competitiveness of the South African avocado industry

Source: Own processing of the data from South Africa's five major Ports Managers and Harbourmasters (2021)

7.4.3 Measuring trade logistics quantity

7.4.3.1 Global Competitiveness Index

When measuring the trade logistics quality of South African avocado industry in relation to those of its global rivals in the export markets (table 7.4) using GCI 4.0, South Africa has the highest overall index than Kenya, similar index with Peru and less index than Mexico, Israel and Spain. The top performing countries seem to be having higher scores compared to South Africa in terms of health and skills. South Africa has the highest score when it comes to financial systems and has a highest score in Innovation Capacity than Peru and Mexico which are the major rivals in avocado global markets. South Africa was revealed as having the lowest health services by this index in relation to all the country's global rivals.

Table 7.4: Global competitiveness index of South Africa and its major global in the avocado export global markets for the year 2019

	Overall	Institutions	Infrastructure	ICT Adoption	Macroeconomic	Health	Skills	Product Market	Labour Market	Financial System	Market Size	Business Dynamism	Innovation Capability
South Africa	62	57	68	50	88	53	58	55	61	83	69	62	45
Mexico	65	48	72	55	98	82	58	58	56	62	81	66	44
Peru	62	49	62	46	100	95	60	57	59	61	62	56	33
Kenya	54	55	54	36	72	55	56	53	59	58	53	64	36
Israel	77	66	83	68	100	98	80	62	71	81	60	80	74
Spain	75	65	90	78	90	100	72	61	61	77	77	67	64

Source: Own processing of the data from Schwab (2019)

7.4.3.2 Logistics Performance Index (LPI)

When measuring logistics trade quality using LPI, it was revealed that South Africa, Mexico, Israel and Spain were logistics friendly while Peru and Kenya were classified as partial performers (table 7.5). This index revealed that in 2018 South Africa had the second highest LPI when compared with its major global rivals in avocado exports markets. Mexico and Peru

which are South Africa's top rivals had the lowest scores than South Africa under all the six indicators used under this index.

Table 7.5: Overall LPI in 2018 of South Africa and its global competitive rivals in the global avocado markers

	Overall International LPI	Customs	Infrastructure	International Shipments	Logistics Quantity & Competence	Tracking and Tracing	Timeliness
South Africa	3.38	3.17	3.19	3.51	3.19	3.41	3.74
Mexico	3.05	2.77	2.85	3.10	3.02	3.00	3.53
Peru	2.69	2.53	2.28	2.84	2.42	2.55	3.45
Kenya	2.81	2.65	2.55	2.62	2.81	3.07	3.18
Israel	3.31	3.32	3.33	2.78	3.39	3.50	3.59
Spain	3.83	3.62	3.84	3.83	3.80	3.83	4.06

Source: Own processing of the data from Arvis *et al.* (2018)

7.4.3.3 The World Bank's Ease of Doing Business: Trading across borders

When measuring trade logistics quality using The World Bank's Ease of Doing Business: Trading across borders (figure 7.5), South Africa was revealed as having the lowest score in comparison to the industry's global rivals in the avocado global export markets. This analysis revealed Spain, Israel and Mexico as having the highest scores.

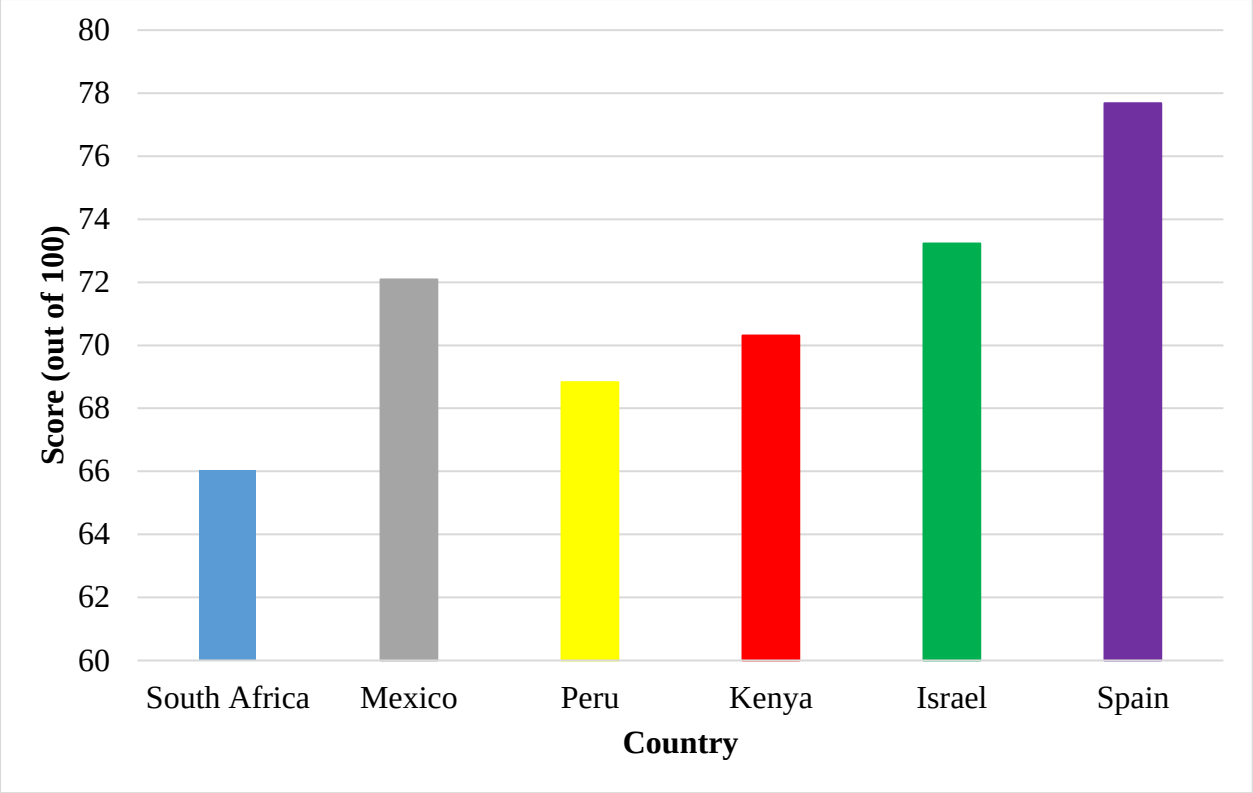

Figure 7.5: 2020 Trading across borders scores for South Africa and its global rivals in global avocado markets

Source: Own processing of the data from The World Bank (2019)

7.5 Conclusion

The South African avocado industry has been displaying lower competitive disadvantages in the global avocado markets. The industry's competitive disadvantages could be attributed to many factors, one of them being transportation and logistics performance for the exporting of this fruit from South Africa to these markets. Respondents to the surveys conducted in this study perceive that the competitiveness of the South African avocado value chain is significantly affected by the transportation and logistics processes responsible for the movement of the avocados from South Africa to local and international markets. This analysis identified three major constraints that negatively affect the competitiveness of the South African avocado industry, and those constraints are: infrastructure constraints, transportation cost drivers, and regulation problems. Also factors which are also affecting the competitiveness of the South African avocado industry as result of transportation and logistics processes include port inefficiencies, poor port management, higher transportation costs, one major seaport for exporting avocados from South Africa, and improper logistics and transportations functioning which results in a number of delays that negatively affect the quality of this fruit.

South African biggest seaports officials together with avocado exporters identified a number of factors that needs to be addressed by the seaports in order to promote the competitiveness of the South African avocado industry in relation to avocados sold to international markets. Those factors include Container terminal operations, management of port security, computerized maintenance systems, and port marketing strategies. These factors were as a result of poor port infrastructures, little technological improvements by South African ports and congestions in the ports.

The factors which were identified by the seaports and constraints identified by exporters during this analysis, were identified as negatively affecting the functioning and efficiency of the transportation and logistics processes in this value chain which ultimately negatively impact the overall competitiveness of this value chain, especially in relation to export markets. Transportation and logistics processes costs and their functioning(efficiency) remains a major constraint for the exporters who are exporting avocados from South Africa to the international markets. This study was able to reveal that all the constraints and factors identified as negatively affecting the competitiveness of this value chain, affected the competitiveness of this value chain through additional costs and delays which affect the quality of the fruit which result in additional financial losses for producers and exporters. These factors and constraints are as a result of poor port infrastructure, ineffective transportation and logistics routes, underutilization of other major seaports by the industry participants, and poor functioning and management of the seaports.

The quantitative part of this study seems to be painting a different picture compared to what the exporters and seaports officials have revealed about the state of the transportation and logistics process of the South African avocado industry in relation to that of its global rivals. Two (GCI and LPI) out of three indices which were used to quantify the trade logistics quantity for South Africa revealed that South Africa is performing at the same level and in some instances even better than its global rivals in terms of the quality of the trade logistics.

In most instances, the quantitative part of this study does support some of the factors which were raises by exporters and seaports officials. The is a clear clash in some of the findings of both the qualitative and quantitative parts of this study. The term “clash” in this regard refers to the situation were the qualitative part of this study revealed some factors as constraining while the quantitative part revealed them as not constraining. The major clashes include port infrastructure, port policies and procedures, port efficiency, and innovation.

Overall, based on the findings of this analysis, the South African avocado transportation and logistics processes are not functioning efficiently, as a result of that they are negatively impacting the overall competitiveness of the South African avocado value chain. The South African avocado industry if it wants to keep up with the intense competition it has been experiencing from its global rivals (which are Mexico, Peru and Kenya), it needs to start addressing the issues associated with transportation and logistics processes. Addressing such issues will require effective value chain strategic development and management by all stakeholders involved in this value chain, especially those who are responsible for the exporting of this fruit. This chapter recommends three major strategies that industry participants could use to improve the competitiveness of this value chain in relation to the transportation and logistics processes. Those three strategies are a) the establishment of efficient logistics and distribution channels, b) port infrastructure improvements, and c) utilization of the other major seaports. These recommendations for alleviating problems related to logistics and transport derived from this analysis will be presented in more details in Chapter 9.

CHAPTER 8: VALUE CHAIN ANALYSIS OF THE SOUTH AFRICAN AVOCADO INDUSTRY

Abstract

The purpose of this final analytical chapter was to analyse the competitiveness of the South African avocado value chain as viewed by the value chain actors and industry experts in order to identify all the factors that have a negative and/or positive influence on the competitiveness of this value chain. This is done with an aim of developing and recommending effective strategic actions that could be used by the participants found in this value chain in order to improve this value chain competitiveness, especially when it comes to export markets. To achieve the purpose of this chapter, a three-step analytical framework was used. In many respects it is similar to the five-step analytical framework used by Esterhuizen *et al.* (2002), Esterhuizen (2006), Esterhuizen & Van Rooyen (2006), Ndou & Obi (2011), Van Rooyen *et al.* (2011), Jafta (2014), Angala (2015), Boonzaaier (2015), Abei (2017), Dlikilili (2018), Sibulali (2018), Barr (2019), Noyakaza (2019), Nkamisa (2020) and Simelane (2021) in various value chain studies that measured and analysed the competitive performance of various agricultural commodities. Climate change, competition in the international markets, and a number of South African agricultural policies were identified as major constraints for the competitiveness of the South African avocado industry.

Keywords: Avocado, competitiveness, South Africa, value chain

8.1 Introduction

According to Kaplinsky & Morris (2001), a value chain describes the full range of activities required to bring a product or service from conception through different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after uses. As the product moves along the value chain, it is assumed to gain value (Zamora, 2016). Value chain actors are the people at each link along the chain required to move a product from the farm to the consumer (McGregor & Stice, 2014).

Value chain analysis (VCA) is a valuable framework for understanding temporal and spatial connectivity of people and food products and other interactions (Alarcon *et al.,* 2017; Muloi *et al.,* 2018). Zamora (2016) showed that VCA is an effective way of examining the interactions among different players in each industry. During the VCA, the chain activities are broken down into different components from basic raw material to the product received by consumers into strategically relevant segments to better understand the whole system, including the behaviour, costs and the sources of differentiation (Shank and Govindarajan 1992; Dekker 2002). A broad approach to VCA start from the production system of the raw materials and move along the linkages with other actors and enterprises engaged in trading, processing, assembling, transportation, etc. (Rosale *et al.*, 2017). VCA is classified as an essential analytical tool for strategic management and very useful for analysing a value chain's strategic improvement (Dekker, 2002). VCA is reasonably flexible, and it can help design projects or programs to provide support to the value chain to achieve the desired development outcome (M4P, 2008).

A five-step competitiveness analytical framework which have been used in studies by Esterhuizen *et al.* (2002), Esterhuizen (2006), Esterhuizen & Van Rooyen (2006), Ndou & Obi (2011), Van Rooyen *et al.* (2011), Jafta (2014), Angala (2015), Boonzaaier (2015), Abei (2017), Dlikilili (2018), Sibulali (2018), Barr (2019), Noyakaza (2019), Nkamisa (2020) and Simelane (2021) to analyse the competitiveness of value chains of various agricultural and agribusiness commodities is one of the most common techniques used in South Africa to perform competitiveness analysis of value chains. The method elicits and analyses the views and the opinions of the participants of these value chains to identify factors that negatively or positively influenced the competitiveness of those value chains. The participants were then asked to rank the influence of those factors using a five-point Likert Scale, were 1 = Most Constraining; 3 = Neutral and 5 = Most Enhancing. A quantitative aspect was also included, in which the researchers used the RTA method to measure the competitiveness performance of

those value chains. From this, the researchers were able to identify and recommend strategic actions that could be used by the value chain participants to make their value chains more competitive.

The five-step analytical framework have been used to analyse the competitiveness different industries and commodities. Most of the industries and the commodities which have been analysed using the five steps analytical framework in South Africa are export oriented. For example, studies by Esterhuizen *et al.* (2002), Esterhuizen (2006), Esterhuizen & van Rooyen (2006), Angala (2015), Boonzaaier (2015), Dlikilili (2018), and Sibulali (2018) have provided a broad analysis of different industries within the agricultural and agribusiness sector in South Africa. On the other hand, studies by Abei (2017), Van Rooyen *et al.* (2011), Jafta (2014), Barr (2019) and Noyakaza (2019) have analysed specific agricultural commodities, i.e., cocoa, apples, sugar and wine from South Africa. The findings of those studies are industry or commodity specific, and it is not appropriate to extrapolate the results of those studies to the South African avocado industry. No recent studies have analysed the competitiveness of the South African avocado industry and compared it with that of its global rivals. A study of this nature is therefore needed in order to recommend strategic actions to alleviate the factors constraining the competitiveness of this industry.

The aim of this chapter is to analyse the competitiveness of the South African avocado value chain as viewed by the value chain actors and industry experts through a detailed value chain analysis (VCA) to identify factors that negatively and/or positively affect its competitiveness. The information obtained during this analysis would be used to recommend strategic actions that the South African avocado value chain actors, especially agribusiness managers, could use to improve the current and future competitiveness of this value chain.

The aim of this study will be achieved by answering the following research questions:

- *What are the factors affecting the competitiveness of the South African avocado value chain?*
- *How can such information be used to establish an industry agenda to promote greater competitiveness?*

The next section provides an overview of the peer-reviewed local and international economic literature on value chain analysis and different methodological procedures for conducting value chain analysis. Section 8.3 provides an overview of the methodology to be used in this chapter.

The results of the value chain analysis of the South African avocado industry are presented in section 8.4. Conclusions are drawn in section 8.5.

8.2 Value chain analysis and techniques for conducting value chain analysis

The aim of this section to perform a literature analysis of the local and international previous value chain and VCA studies to be able to understand these concepts and choose a method to use to perform VCA to achieve the main objective of this study.

8.2.1 Value chain

A value chain represents enterprises in which different producers and marketing companies work within their respective businesses to pursue one or more end markets (Mango *et al.*, 2015). Advances in communication technologies and declining transportation costs facilitate coordination between value chain actors (Gibbon *et al.*, 2008). According to Kit (2006), agricultural value chain actors can be divided into two groups namely direct and indirect actors. Direct actors are the ones that are commercially involved in the value chain (input suppliers, producers, processors, traders, retailers, consumers) and indirect actors are the ones that provide support services like financial and non-financial services and support the functioning of the value chain (bankers and credit agencies, business service providers, government, researchers, and extension agents).

According to Zamora (2016), a value chain can be divided in terms of who drives the chain: buyer-driven chain and producer-driven chain. Buyer-driven chains are common in labour-intensive, consumer goods industries where large retailers, merchandisers and trading companies play a central role in establishing production networks usually in developing countries while producer-driven chain is characterized by capital intensive and technology-oriented industries dominated by the large transactional corporation which play a key role in managing the production networks (Abecassin-Moedus, 2006; Zamora, 2016). Each stakeholder in the chain has a link to the next to form a viable chain (Kumar & Kapoor, 2010). It has been argued that linking of farmers to the markets through effective value chains would reduce the use of intermediaries in the chain and strengthen the value-adding activities by better technology and inputs, upgraded infrastructure and processing and exports (Pabuayon *et al.*, 2009; Miller & Jones, 2010; Kamar & Kapoor, 2010). Kamar & Kapoor (2010), provided that this process can raise the income of farmers and provide an incentive to improve the management practices towards higher farm productivity.

The value chain approach involves addressing the major constraints and opportunities faced by players at different levels of the value chain through a wide range of activities such as ensuring access to the full range of necessary inputs, facilitating access to cheaper inputs, strengthening the delivery of business and financial services, or increasing access to higher-value markets (Chagomoka *et al.*, 2015). The value chain approach is flexible and mainly a descriptive tool to look at the interactions between different economic agents (Rosale *et al.*, 2017). The value chain approach, by its conceptualization, provides an indicative picture of underlying costs, profits, and trade competitiveness of various crops at a particular point in time (Karl *et al.*, 2007; Mango, 2015).

8.2.2 Value Chain Analysis (VCA)

According to Porter (1985), within a value chain system, some relationships exist. These relationships are between activities in the value chain, between business units of the firm and between the firm and its suppliers and buyers. The ability of the firm to be able to identify these relationships and the information associated with each relationship will enable firms to be more competitive. "To manage a business well is to manage its future; and to manage the future is to manage information" (Harper Jr 1961; Neves *et al.*,2013; Page 8). VCA is important because it provides a framework used to identify and understand the value chain governance, structural deficiencies, and challenges (Kaplinsky & Morris 2001; Alarcon *et al.*, 2017; Muloi *et al.*, 2018). A study carried by Muloi *et al.* (2018), aiming at characterising camel milk system supplying Nairobi city, and assess its governance, main challenges and the potential food safety risk practices using a value chain framework, grouped major challenges or barriers experienced by different stakeholders of the chain into nine categories. Those nine were i) policy, ii) marketing, iii) financial, iv) infrastructure, v) relational, vi) security, vii) technology and ix) organizational.

VCA has been used to evaluate and examine entire industries and industry clusters as well as specific systems within firms (Zamora, 2016). It has also been used to examine the global value chain (GVC), which is defined "as a shift to higher value-added products, services, and production stages through the increasing specialization and efficient domestic and international linkages" (Ernst, 2004; Zamora, 2016; Page 117). According to Recklies (2001), VCA describes activities within and around an organization and relate these activities to an analysis of the competitive strength of the organization. When it comes to the activities in the value chain, Porter divided them into two: Primary and Secondary activities (figure 8.1). Primary activities are directly concerned with the creation or delivery of a product or service and they

are divided into five main areas which are inbound logistics, operations, outbound logistics, marketing and sales, and service. Supporting activities are divided into four main areas which are procurement, technology development, human resource, and infrastructure (systems for planning, finance, quality, information management). According to Recklies (2001), the term margin (figure 8.1) implies that organizations realize a profit margin that depends on their ability to manage the linkages between all activities in the value chain.

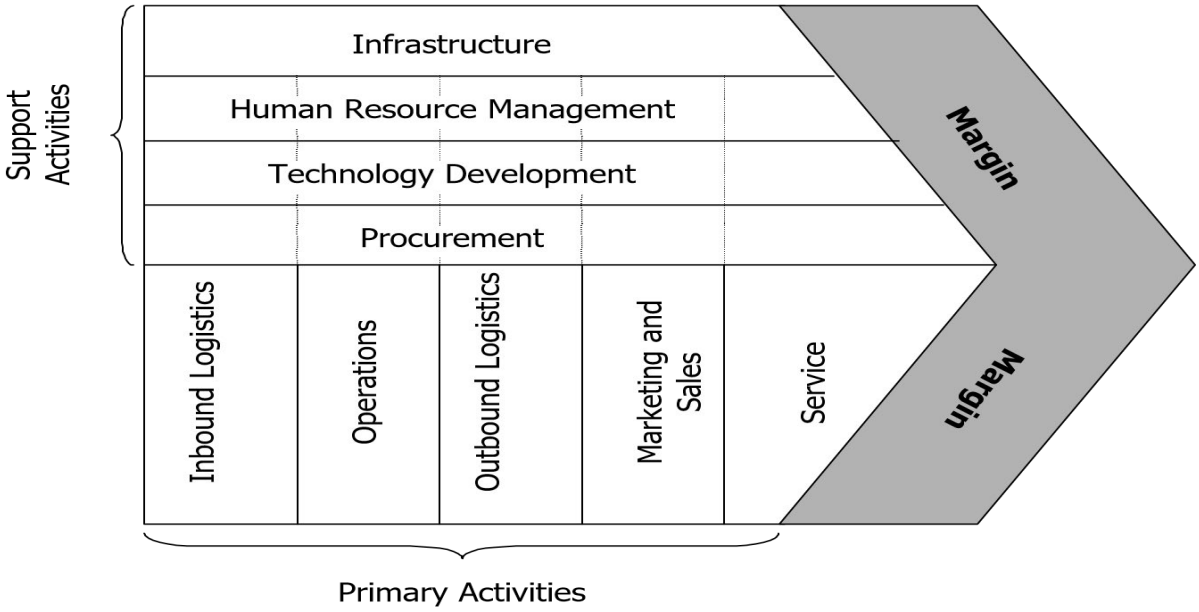

Figure 8.1: Primary and secondary activities of a value chain

Source: Porter (1985)

A VCA can also uncover insights into challenges that are faced by the sector because of different drivers, such as weak governance and market access including small firms and competitiveness in changing markets (Rosale *et al.*, 2017). A typical value chain analysis can be performed in the following steps (Rich *et al*., 2011)

- Analysis of own value chain- which costs are related to every single activity
- Analysis of the customer's value chain- how does the product fit into their value chain
- Identification of potential cost advantage in comparison with competitors
- Identification of potential value-added for the customers- how can the product add value to the customer (lowest cost or higher performance)

VCA has generated a simple and effective tool which compares producer's assessment of their competitiveness with buyer's assessment of the producer's competitiveness, so that this technique can work, it is essential to break down what one means by competitiveness and to operationalise the components in simple terms (Schmitz, 2005). The author explained this

further by giving an example using the footwear industry to assess competitiveness. The relevant criterions used are the following: Product quality, Price, Time from order to delivery, Punctual delivery, Flexibility, and Innovation design.

Results are shown on figure 8.2 on how producer view his competitiveness and how his buyers view it.

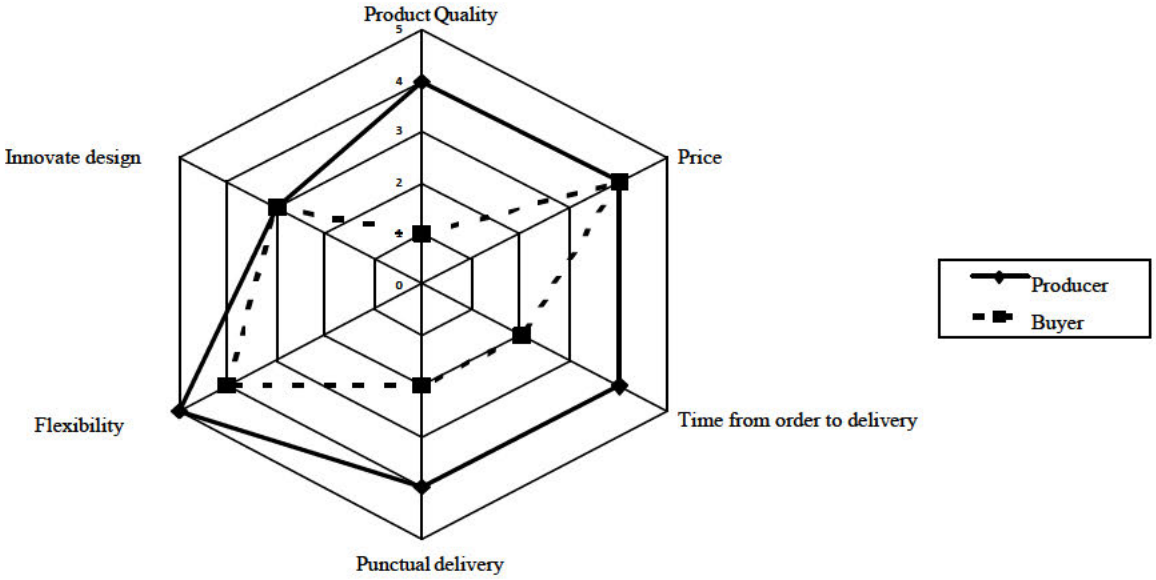

Figure 8.2: Comparing the views of producer and buyers on a spider diagram

Source: Schmitz (2005)

8.2.3 Application of VCA

For any industry to apply VCA effectively, it is important to know how that industry is constructed in terms of information, product, as well as money, flows between the different actors in the chain (Spies, 2011). VCA is simply a tool that can assist the people involved in the chain to better understand the business world they are operation in (McGregor & Stice, 2014). The authors stated that the VCA is important because of the following reasons: VCA can identify all actors involved in the chain, VCA can identify the contribution and the risks faced by each actor, and VCA can identify the weaknesses that prevent progress and suggest actions that can be taken. Lusby & Panlibuton (2004), provided several steps that can be followed when conducting VCA. Those steps were: identify final markets, identify key functions, identify participants performing each function, map participants according to the specific functions they perform, map inter-relationships between participants, submit a description to the private sector and specialists and make the necessary adjustments, and monitor and evaluate.

8.2.4 Methods to analyse value chains

According to (Kaplinsky & Morris, 2000; Spies, 2011), table 8.1 provides several aspects that are needed to be included in chain analysis, the ones highlighted with a bold font are applicable to this study. Spies (2011), argued that value chain mapping is an important step in analysis of a chain, followed by additional analysis depending on the information required, quantifying, and describing value chain details, economic analysis and, benchmarking and chain upgrading. The areas of investigation highlighted in red have been applied in some parts of this study.

Table 8.1: Data requirements for chain analysis

Area of Investigation	Data Required
Commodity characteristic	• Grades and grading systems. • Perishability. • Physical handling requirements. • Packing methods and materials for shipment and sale.
Consumption patterns	• Trends in the domestic and export market. • Consumption patterns by socioeconomic and ethnic group. • Future market prospects.
Supply situation	• Production by region. • Stocks for transformation and consumption by season and region. • Flows between markets, including imports and exports.
Price relationship and seasonality	• Method of procurement. • Secular trends in real prices at the farm gate, wholesale and retail levels. • Seasonal and cyclical trends in prices. • Changes over time in relative price relationships. • Changes over time in input/output price and cost relationships.

Table 8.1: Data requirements for chain analysis (Continued)

Area of Investigation	Data Required
Food system participants and organization	• Marketing channels and commodity sub-sector stages. Important assembly, redistribution, and terminal markets. • Types, numbers, and geographical distribution of firms at key sub-sector stages. • Prevalence and importance of alternative institutional arrangements, such as contracts, vertical integration, direct marketing, cooperatives, and spot markets.
Sub-sector and food system operation or behaviour	• Practices and strategies of sub-system participants (individuals, firms, organisations for procuring inputs, processing, storage and marketing of outputs). • Vertical coordination mechanisms: exchange arrangements, risk-reduction/sharing, information dissemination. • Sources, uses and distribution of production and marketing information. • Adaptability and responsiveness of sub-system to shifting supply/demand, exogenous shocks, policy changes and uncertainty. • Evidence of market power.

Table 8.1: Data requirements for chain analysis (Continued)

Area of Investigation	Data Required
Marketing system infrastructure	• Physical infrastructure (transport, including roads, ports, airports, and waterways; marketplaces; storage and processing facilities; communications; electricity; water supply). • Infrastructure adequacy and bottlenecks. • Evidence of excess or unutilised capacity.
Government marketing, institutions and policies	• Regulatory environment: rules; input and product regulations; laws affecting marketing and trading activities; property rights. • Public marketing institutions (parastatals, cooperatives, joint ventures); the extent and nature of their participation in marketing; effect on the behaviour and performance of private participants in the food system. • Macroeconomic policies: price policies; exchange, interest, wage rate policies; fiscal and monetary policies. • Banking and credit policies.

Table 8.1: Data requirements for chain analysis (Continued)

Area of Investigation	Data Required
International trade and commodity competitiveness	• Commodity exports and world market situation. Imports of the commodity or substitutes and their impact on domestic production, markets, and prices. • Trends in exports and imports. • Likely changes in exports and imports, and emerging market opportunities or dependencies. • The competitiveness of exports in particular foreign markets.
Representativeness of the period under study	• Timing of the study relative to the annual commodity production and marketing cycle. • Agricultural and economic characteristics of the year of the study relative to earlier years or climatic cycles.

Source: (Kaplinsky & Morris, 2000; Spies, 2011)

8.2.4.1 Sub-Sector Analysis (SSA)

SSA encompasses a meaningful grouping of economic activities linked horizontally and vertically by market relationships (Nang'ole *et al.*, 2011). The authors also stated that SSA involves studying the networks of relationships linking suppliers, processor, transport and traders in a way that connect producers and enterprises with final consumers of goods and services.

8.2.4.2 Commodity Chain Analysis (CCA)

The CCA which was originally called *filiere* analysis, was developed as an analytical tool to study ways in which agricultural production systems were organized in the context of developing countries (Nang'ole *et al.*, 2011). This framework paid attention to how local production systems is linked to the processing industry, trade, export, and final consumption (Van de Berg *et al.*, 2009). According to Rodurer (2004), this analysis method tended to be

viewed as having a static character, reflecting relations at a certain point in time and it did not indicate the growing or shrinking flows either of commodity or knowledge nor the rise and fall of actors. During this approach, specific physical condition flows within a sector are mapped with the focus being on domestic markets while ignoring dynamic adjustments to sector relationships and characteristics (Raikes *et al.*, 2000; Kaplisky & Morris, 2001; Alemu, 2014)

8.2.4.3 Global Commodity Chain (GCC)

The concept of GCC was introduced by Gereffi and others in the 1990s. GCC focuses on the power relations in the coordination of globally dispersed, but linked production systems (Nang'ole *et al*., 2011). A study done by Gereffi *et al*. (2005), utilized the framework of the value chain to examine how firms and countries are globally integrated and to assess the determinants of the global income distribution. According to (Kaplinsky & Morris, 2001), Gereffi established four core elements of GCC: I) Input-output structure, II) Territorial structure, III) Institutional framework, and IV) Governance structure.

In conclusion, a value chain represents a number of enterprises in which different producers and marketing companies work within their respective businesses to pursue one or more end markets. Each stakeholder in the value chain has a link to the next in order to form a viable chain. VCA is important because it provides a framework used to identify and understand the value chain governance, structural deficiencies, and challenges. VCA can also be used to describe activities to an analysis of competitive strength of the organization. In order to conduct an effective VCA, a number of different information with regards to the value chain is required, which includes value chain actors, activities, processes, money and flows between different actors.

From the literature, it was clear that the is no single method of conducting value chain analysis, and a range of methods have been used to carry out this type of analysis. The choice of method is influenced by the objectives of the study. Taking into accounts the objectives of any value chain analysis studies, a number of aspects needs to be included during VCA. For example, since the overall objectives of this study is to conduct a detailed competitiveness analysis for the South African avocado value chain, in order to conduct a VCA for this study, the literature suggests that a number of aspects needs to be included. Those aspects are a) Commodity exports and world market situation. Imports of the commodity or substitutes and their impact on domestic production, markets, and prices; b) Trends in exports and imports; c) Likely changes in exports and imports, and emerging market opportunities or dependencies; and d)

The competitiveness of exports in particular foreign markets. These aspects can help researchers to choose or develop an appropriate method to measure and analyse competitiveness in order to achieve the objectives of their studies.

8.3 Methods and Materials

To achieve the objective of this chapter, a three-step analytical framework derived from the five-step analytical framework which was used in studies by Esterhuizen *et al.* (2002), Esterhuizen (2006), Esterhuizen & Van Rooyen (2006), Ndou & Obi (2011), Van Rooyen *et al.* (2011), Jafta (2014), Angala (2015), Boonzaaier (2015), Abei (2017), Dlikilili (2018), Sibulali (2018), Barr (2019), Noyakaza (2019), Nkamisa (2020) and Simelane (2021) was used this chapter. These steps are:

Step 1: Determine factors affecting the competitive performance of the South African avocado value chain through interviews with industry participants, experts and knowledgeable stakeholders, and avocado executive survey

This step involved determining the factors that either positively and/or negatively influence the competitiveness of the South African avocado. The factors were first identified through literature analysis, consultations with industry players and experts, and various consultations with SAAGA. A structured questionnaire (Appendix C; Questionnaire 3) was developed, designed in the form of the Porter competitive diamond model to rate the impact of the factors identified using a 7-point Likert scale with ***1-constraining***, ***4-neutral***, and ***7-enhancing***. Although some previous studies have used a 5-point Likert scale, this study will use a 7-point Likert scale based on findings of Finstand (2010) and Diefenbach *et al*. (1993) who respectively found that "the five-point item scale was slightly poor than 7-point item scale on all criteria, and significantly worse with subjective opinions" (Finstad, 2010: Page 106), and that 7-point Likert scales performed better that 2-point, 5-point, 12-point and 100-point alternatives. This analysis was conducted in a form of a census study which involved all 409 members of SAAGA.

Step 2: Analyse such factors affecting the competitiveness of this value chain to identify major factors enhancing and/or constraining the competitiveness of the South African avocado value chain

For this step, a methodology developed by Porter (1990) to analyse competitiveness (Porter's Diamond) will be adapted and used for this part of this study to analyse the factors affecting the competitive performance of the South African avocado industry. Base on this methodology,

six key determinants, namely: 1) production factor conditions, 2) demand conditions, 3) related and supporting industries, 4) firm strategy, structure and rivalry, 5) government intervention and policy, and 6) chance would be used to determine the forces and factors influencing the competitive performance of the export oriented South African avocado industry.

Step 3: Propose strategies to enhance the competitiveness of the South African avocado value chain

This step involves using all the information obtained from both steps (step 1& 2) to propose industry-wide strategies that could be used to make the industry more competitive at a local and export levels.

This particular study/chapter uses the three steps out of five steps because, only the three steps are necessary to answer the research questions investigated in this chapter. However, the other two remaining steps have been addressed in different parts of the overall study. The two steps which were left out in this chapter are: a) Defining Competitiveness and b) Measure industry competitiveness using RTA. For example, both of these steps were addressed during the competitiveness assessment of the South African avocado value chain analysis in Chapter 5.

8.4 Results and Discussion

Step 1: Determine factors affecting the competitive performance of the South African avocado value chain through interviews with industry experts and knowledgeable stakeholders, and avocado executive survey

The South African avocado industry census study was conducted using Survey Monkey and the responses are highlighted in table 8.2. 201 responses were received from this analysis which represents 49% response rate. Representing that response rate, 60% was from all the different type producers identified in chapter 3 and the remaining 40% was from the other actors in the South African avocado value chain who are SAAGA members which included input suppliers, packhouses and processing firms. The survey respondents identified government interventions and policies as the most constraining determinant while related and supporting industries were identified as the most enhancing determinant.

Table 8.2: The determinants of competitive performance in the South African avocado industry

Determinants	Mean	Determinants	Mean
(I) Production factor condition		**(II) Related & supporting industries**	
The general infrastructure used by the industry	4.11	Financial services providers	4.24
The cost of industry infrastructure	2.16	Privately funded scientific research	4.24
The cost of doing business in the industry	2.63	Government-funded scientific research	2.18
The quality of research available for the industry	4.47	Evaluation and testing new varieties according to industry's best practices	4.94
The quality of technology available	4.65	Access to grower-club varieties	3.59
Access to quality technology	4.68	Avocado industry's expenditure on research and development	4.06
The cost of technology	3.58	Collaboration with scientific research institutions	4.71
Would technology advancement impact competitiveness?	5.53	Electricity supply	2.59
Does the changing structure of the industry impact competitiveness?	4.50	Telecommunication services	3.71
Obtaining long-term finance	3.63	Specialized technology services	5.65
Obtaining short-term finance	3.95	The cost of specialised or hired technology	3.59
Skilled labour	2.74	Availability of local suppliers of primary inputs	5.53
Competency level amongst skilled labour	3.42	The quality of local suppliers of primary inputs	5.29
Obtaining unskilled labour	5.95	The sustainability of local suppliers of primary input	4.94
The quality of unskilled labour	2.79	Availability of storage and packing facilities	5.18
Cost of hiring unskilled labour	2.47	The cost of storage and packing facilities	3.76
Extend of using labour saving machinery	5.21	Availability and reliability of transport	5.29
Access to natural resources (Land & Water)	2.63	Effective management of the cold chain	5.59
Your location's suitability for avocado production	5.47	Necessary infrastructure requirements for export purposes	3.88
Establishment and production costs	2.84		
The impact of local climate/weather variation	1.79		
The productivity level of the industry	3,84		
The effectivity level of your business	5.05		
The transportation to export	3.42		
The storage (export product)	3.32		

Table 8.2 (continued)

Determinants	Mean	Determinants	Mean
(I) Firm strategy, structure and rivalry		**(II) Government support & policies**	
The management of information flow from suppliers to your company	4.63	South Africa's trade policies	2.71
The flow and use of information from consumers to your company	4.75	South Africa's land reform policies	1.88
The management of market intelligence for the avocado fruit industry	4.88	South Africa's labour policies	2.24
Competition in the local market	2.13	South Africa's macro-economic policies	3.06
Threats of new entrants locally (new avocado farmers)	3.19	South Africa's competitions act	3.53
Competition in the international markets	1.06	South Africa's BEE policy	2.29
Threats of new international competitors	1.06	The credibility and reliability of the current political system	1.88
To what extent does economies of scale influence your competitiveness	5.38	The credibility and reliability of politicians	1.35
Your willingness to reinvest in avocado operations	5.13	Regulation standards	4.41
Your willingness to take risks	5.25	Complying with regulatory standards	4.24
Does your current resource base support future avocado fruit operations	4.75	Administration of regulation	3.12
Competition for resources used by the industry vs other agricultural related activities	4.38	The taxation system	2.71
		Political factors effect on company's strategic position	2.94
		The effect of corruption and opportunism on business competitiveness	1.82
		The water regulation act	2.94
		The call for land expropriation without compensation	1.53

Table 8.2 (continued)

Determinants	Mean	Determinants	Mean
(I) Demand conditions		**(II) Chance factors**	
Local market size	2.94	The current exchange rate	4.63
Local consumers preference of avocado fruit	3.78	Cost of crime	1.23
The growth in volume of the local market	3.44	Global developments	4.60
The growth in value of the local market	3.89		
Consumer education and availability of information, to base marketing decisions on	4.39		
The international avocado fruit export market	4.67		
The diversity of new international marketing markets	4.17		
The influence of adverse weather conditions on buying patterns of avocados in export market	3.11		
Seasonality and availability of the South African fruit impacts the industry's competitiveness	3.39		
The South African avocado industry's relationship with mega retailers	5.00		
The chance of expansion in the existing markets	4.39		
The likelihood of emerging markets increasing your firm's competitiveness	4.83		
Changing composition of food demand (food preference)	5.28		
Brexit agreement impact on the competitiveness	3.78		
Competition from Northern Hemisphere producers	2.83		

Source: Own processing

The findings identified the following as the *seven* most enhancing factors:

- ***Relationship with mega local retailers (mean of 5.00 out of 7):*** The participants indicated that their relationship with the mega local retailers plays an important role in the industry's competitiveness, especially in supplying the avocados locally. A significant percentage of avocados in the South African avocado value chain are sold through retailers. There was a clear consensus among many of the participants regarding the influence of this factor. 11.11% of the participants ranked this factor with a score of between 1-3, 27.78 of the participants remained neutral while the remaining 61.12% ranked it with a score of between 5-7, with 38.89%, of the participants ranking it with a score of 6. But the size of the local market and its growth was ranked with a mean of 2.94 out of 7, which classify it as a constraint.

- ***Storage and packing facilities (mean of 5.18 out of 7):*** This enhance competition for actors by allowing them to be able to store their produce for a certain period during harvesting season so that the actors will be able to sell their fruits at the right price while being packed using suitable packaging materials. The was a clear consensus from a number of participants regarding the availability of these facilities. 11.76% of the participants ranked this with a score of between 1-3, 23.53% of the participants remained neutral while the remaining 64.70% ranked it with a score of between 5-7 with most participants in this group ranking it with a score of 6. The issue which was noted during this analysis was that there was limited access to these facilities for exporters. This was as a result of higher costs which are associated with such facilities for exporting avocados from South Africa. The costs of storage and packing facilities for export markets was ranked with a mean of 3.76 out of 7, which classified it as a constraint for these facilities.

- ***Changing food preferences (mean of 5.28 out of 7):*** The participants indicated that the growing 'middle class', which is more concerned with healthy foods and living, has enabled them to be more competitive since most of them are purchasing this fruit. The was a good consensus among the participants regarding the influence of this factor. 5.56% of the participants ranked this factor with a score of between 1-3, 27.78% of the participants remained neutral and the remaining 66.66% ranked it with a score of between 5-7, with 44.44% of the participants in this group ranking it with a score of 6. But on a global scale consumer preference are influenced by major global developments

which participants of this analysis ranked with a mean of 4.60 out of 7. A major constraint which is associated with changing consumer food preferences was highlighted from previous chapters, were industry participants indicated that they have not been able to realize the full potentials of the local markets due to lack of strategic developments.

- ***Economies of scale (mean of 5.38 out of 7):*** Many producers benefit from combining their produce with other producers in order to meet the export markets' demand. How these relationships are formed, maintained and also how do they influence the competitiveness and the performance of actors in the South African avocado industry was highlighted during the Social Network analysis (Chapter 4) part of the overall study. The was a clear consensus from many of the participants about the level of influence brought about by this factor. The was no participants who answered with a score of between 1-3. 25% of the participants remained neutral while the remaining 75% ranked the influences of this factors with a score of between 5-7.

- ***Availability and the quality of the local suppliers of primary inputs (mean of 5.53 out of 7):*** The supplying of fertilizers, chemicals, planting materials, and machinery and equipment by local suppliers enable the actors to obtain these materials faster, and at a reasonable price, as a result, it gives the industry a better competitive advantage. Another way in which this promotes competitiveness for the producers is that most of the input suppliers provide their inputs on credit. The was a clear consensus from many participants regarding the influence of this factor as 5.88% of the participants ranked this factor with a score of between 1-3, 11.76% of the participants remained neutral, while the reimaging 82.35% ranked it with a score of between 5-7 with most participants in that group ranking it with 52.94%. The participants ranked the overall quality of the inputs provided by the local suppliers with a mean of 5.29 out of 7.

- ***Effective management of the cold chain (mean of 5.59 out of 7):*** The industry is export oriented and it has achieved success in the international markets through various cold chain management systems. Over the years, other South African producers have managed to develop effective cold chains with local retailers, and a perfect example is Westfalia Fruit Group and Woolworth. The was clear consensus from many participants regarding the influence of this factor, with 5.88% of the participants ranking it with a score of between 1-3, while 5.88% of the participants remained neutral and the

remaining 88.23% ranked it with a score of between 5-7 with 35.29% of participants from this group ranking it with a score of 6. This was made possible by the availability and the reliability of transportation services which were ranked with an overall mean of 5.29 out of 7. However, the availability of transportation is constrained by the costs of transportation services, especially for the export markets which were ranked with a mean of 3.42 out of 7 by the participants.

- ***Technology advancement (mean of 5.65 out of 7):*** The participants indicated this enables the industry to enhance its competitiveness since technology advancement helps to reduce input costs and promotes efficiency. There was a clear consensus among a large number of participants about the influence of technological advancements on the competitiveness of the South African avocado value chain, hence this was the highest ranked factor in terms of enhancing the competitiveness of this value chain. 10.53% of the participants ranked this factor with a score of between 1-3, 5.26% remained neutral and the remaining 84.51% ranked it with a score of between 5-7, with 47.47% of the participants ranking it with a score of 6. This is also supported by other factors which fall under technological advancements. Participants also ranked specialized technological services with a mean of 5.65 out of 7, and the extent of using labour saving machinery because of technological advancements with a mean of 5.21 out of 7. On the other hand, the cost of technology was identified as a major constraint with a mean of 3.58 out of 7. As a result of the costs, access to quality technology was ranked with a mean of 4.65 out of 7. The distribution of responses for access to quality technology consist of 15.79% of participants ranking it with a score of between 1-3, 26.32% remained neutral while 57.89% of the participants ranked it with a score of between 5-7.

This study identified the following factors as the *six* most constraining:

- ***Competition in the international markets (mean of 1.06 out of 7):*** The participants indicated that the industry has been experiencing intense competition in the global or export markets from competitors like Peru, Mexico, and Kenya. A number of factors which are responsible for this have been highlighted in the previous chapters. There was a general good consensus from the participants with regards to the influence of this factor. 87.50% of the participants ranked this constraint with a score of between 1-3 with 50% of the participants in this group ranking it with a score of 2, 6.25% of the

participants remained neutral while the remaining 6.25% ranked it with a score of between 5-7. More threat in the exports markets were ranked with an overall mean of 1.06 out of 7. This is as a result of northern hemisphere countries developing avocado variants which enable them to compete with the southern hemisphere countries.

- ***Crime (mean of 1.23 out of 7):*** Producers are the ones who are significantly affected by crime and they indicated that the level of losses they experience because of it in terms of quantities is a lot, hence to some extent their competitiveness is impacted. The was a clear consensus among producers who according to this analysis are mostly affected by the criminal activities. 88.24% of the participants ranked this factor with a score of between 1-3, with 70.59% of this group ranking it with a score of 1 and 100% of participants who are producers were answered within this range. 11.76% of participants remained neutral and none of the participants answered using the scale which was above neutral.
- ***Climate/weather variations (mean of 1.79 out of 7):*** Participants indicated that the South African avocado industry is highly vulnerable to climate variability and change. There was a clear consensus about the negative influence climate/weather variations have on the competitiveness of the South African avocado value chain. 94.46% of the participants ranked the effect of this factor with a score of between 1-3, with 52,63% ranking it with a score of 2, 5.26% of the participants remained neutral and no participants ranked the effect of climate/weather variations with a scale which was above neutral. Producers ranked the suitability of their location for avocado production with a mean of 5.47 out of 7, which is an indication that their locations are highly suitable for avocado production. The main issue which makes climate/weather variation a major constraint is the unpredictability which is associated with it when it comes to avocado production. A study conducted by Randela (2018) which was aiming to assess the impacts of climate variability and change on the production of avocados in Limpopo province to recommend adaptive strategies for farmers that might boost their economic returns concluded that avocado production is generally sensitive to changes in temperature than rainfall in the Limpopo province which is the top avocado production region in South Africa. All of this has a significant effect on the competitiveness of producers and yields of avocados produced, which have negative financial implications for producers.

- ***The credibility and reliability of South African policymakers and political system (mean of 1.88 out of 7):*** The so-called new political system in South Africa, which consist of coalitions between different political parties, have been described as "unstable and unpredictable" by the avocado value chain actors, and this has created a playing field that is filled with uncertainty, as a result, it makes it hard for actors to think long term when it comes to their operations. This political system is constraint by the credibility and reliability of politicians which according to this analysis was ranked with a mean of 1.35 out of 7. As a result of that, there was a general good consensus regarding the credibility and reliability of politicians and political system among participants were 76.47% of participants ranked it with a score of between 1-3 with 64.71% of that group ranking it with a score of 1, 17.65% remained neutral while 5.88% ranked it with a score of between 5-7.
- ***South African land reform polices (mean of 1.88 out of 7):*** The uncertainty regarding the issue of land ownership in South Africa which there is still a big debate amongst policy makers have made it difficult for producers to develop long term strategies regarding their operations which has impacted their competitiveness. The was a clear consensus from a large number of participants regarding the influence of this factor from the participants. 76.47% of the participants ranked the influence of this factor with score of between 1-3, with 58.82% of the participants in this group ranking it with a score of 1, 23.53% of responded remained neural and none of the participants ranked this factor with a score that was above neutral. This factor is one of the major constraints as the results of a newly proposed policy which seek to expropriate land from many producers without compensation, and the influence of this policy was ranked with a mean of 1.53 out of 7, which makes it a major competitive constraint.
- ***The cost of industry infrastructure (mean of 2.16 out of 7):*** In comparison with their major competitors, the industry participants indicated that the costs of infrastructure (transportations, storage, packing facilities, ports) are significantly higher than that of their global competitors. There was a clear consensus among the participants about the influence of this factor with no participant answering with a score which is more than neutral. 78.95% of participants ranked the effect of this constraint with a score of between 1-3, with 68,42 ranking it with a score between 1-2 and the remaining 21.05% of participants remained neutral.

- ***Electricity supply (mean of 2.59 out of 7):*** Participants at all levels of the value chain indicated that both electricity supply negatively impact their competitiveness compared to their global rivals. This was supported by the level of consensus in the responses of participants with 76,47% of participants ranking it with a score of 1-3 with most of the participants in that group ranking it with a score of 2, 11,76% of participants remained neutral while the remaining 11.76% of participants ranking it with a score of 5-7.

Step 2: Analyse such factors affecting the competitiveness of this value chain to identify major factors enhancing and/or constraining the competitiveness of the South African avocado value chain

These factors were further analysed as follows

- ***Production factor condition (3,79 out of 7):*** This determinant was identified as slightly constraining the competitiveness of the South African avocado industry. Cost of sector specialized infrastructure, shortage of skilled labour, quality of unskilled labour, climate change and access to natural resources were factors contributing in constraining the competitiveness of the South African avocado industry under production factor conditions. Factors that positively influence competitiveness under this determinant are technology advancement, location of most of the production regions, obtaining of unskilled labour, and the quality of research conducted by SAAGA for the industry. Figure 8.3 shows the distribution of industry participants' responses from the seven-point Likert scale rating. This figure indicates that there is no clear consensus regarding how the factors under the production factor condition affect the competitiveness of the South African avocado industry.

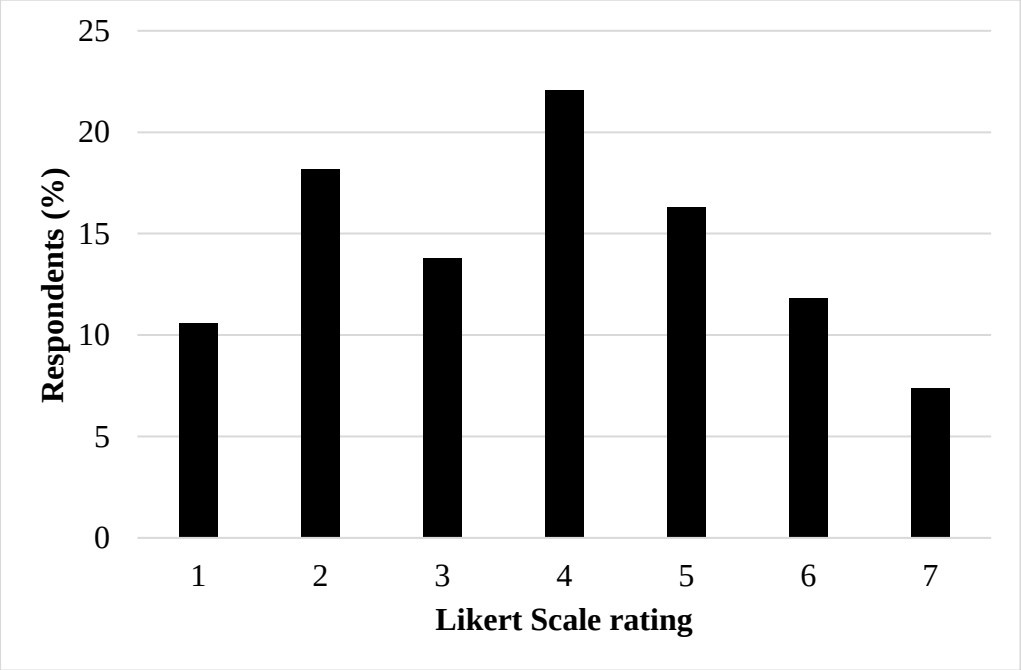

Figure 8.3: Overall responses for production factor conditions per each rating of the Likert scale

Source: Own processing of the data from SAAGA exporters survey (2021)

- ***Demand conditions (3,99 out of 7):*** The demand conditions factor has an overall ratio that is slightly below the neutral range, as a result, it falls other a minor constrain of competitiveness for the avocado industry according to this analysis. The analysis identified local market size as a major constrain under demand conditions for the South African avocado industry. Changing food preferences caused by the emerging "middle class", relationship with local retailers, consumer education and the availability of market information for consumers, avocado export markets, and the projected room for expansion in the local markets were factors identified as enhancing the competitiveness of the South African avocado industry under demand condition. Figure 8.4 shows the distribution of industry participants' responses regarding the demand condition factors. The figure indicates a clear variation of the responses from participants when it comes to this determinant, which shows that there was no clear agreement with regards to the effect on competitiveness of this value chain as a result of this determinant.

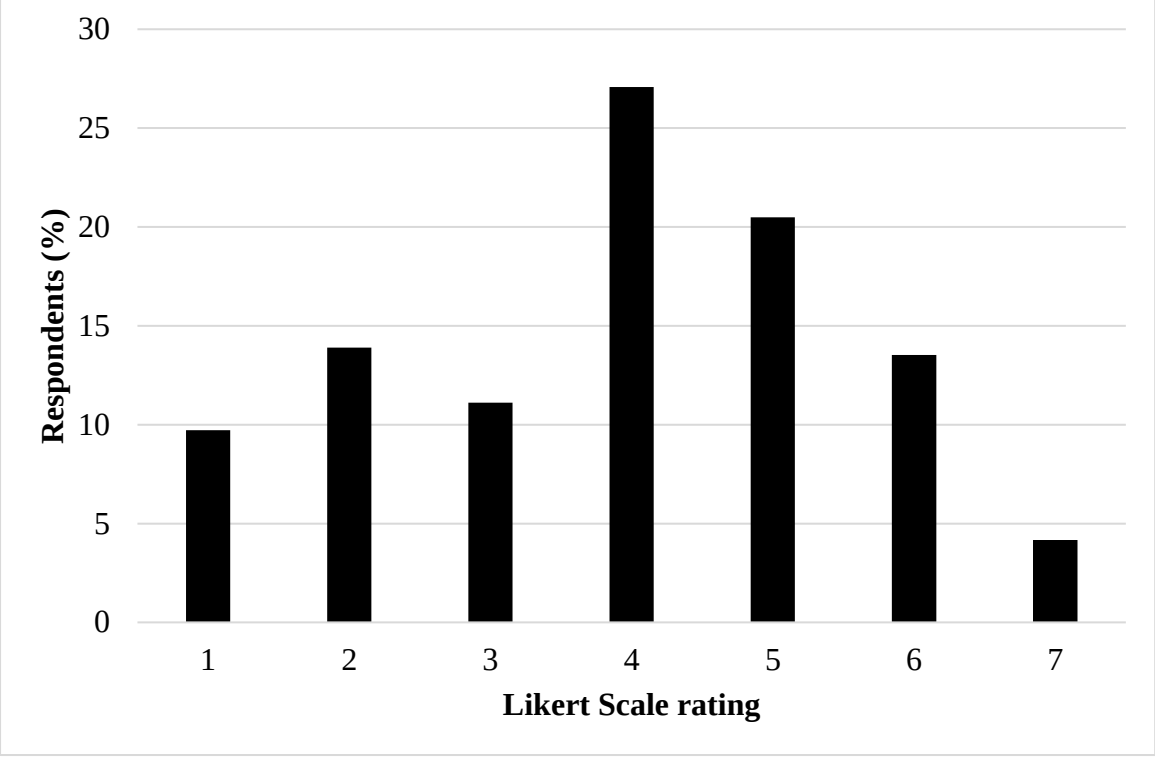

Figure 8.4: Overall responses for demand conditions per each rating of the Likert scale
Source: Own processing of the data from SAAGA exporters survey (2021)

- ***Relating and supporting industries (4,35 out of 7):*** This analysis identified this determinant as the most enhancing for the South African avocado industry. Specialized technology services, effective management of the cold-chain, availability and reliability of transport services, availability of storage and packing facilities, evaluation and

testing of new varieties with an aim of outperforming rivals, and availability of local primary input suppliers. Electricity supply and lack of government-funded research were their major constraints of competitiveness under relating and supporting industries. The distribution of responses shown in figure 3.6, as the same as the other determinant, shows some level of variation about the influence of the factors and how they impact the industry's competitiveness. But unlike the other determinant, in this determinant the is a clear indication that most participants view relating and supporting industries as enhancing the industry's competitiveness.

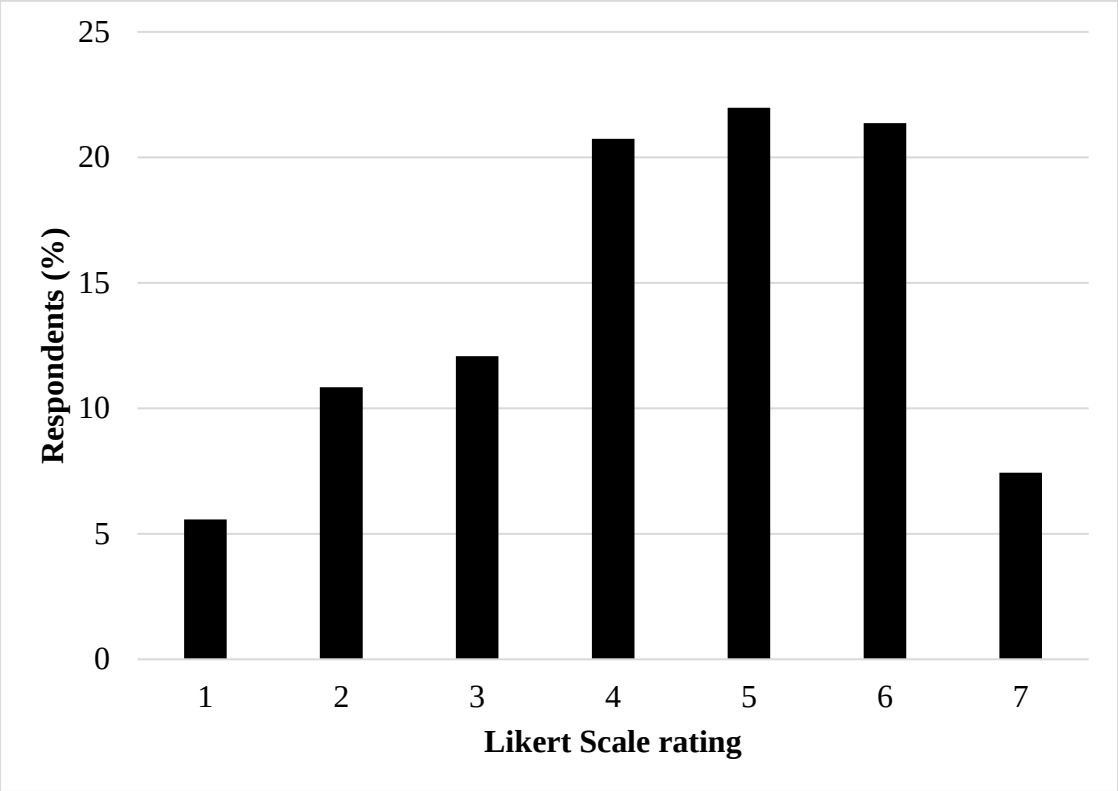

Figure 8.5: Overall responses for relating and supporting industries per each rating of the Likert scale

Source: Own processing of the data from SAAGA exporters survey (2021)

- ***Firm strategy, structure, and rivalry (3,88 out of 7):*** this determinant was identified as constraining to the South African avocado industry. This was due to the fact that industry participants identified competition in the international markets and threats of new additional competitors in the global markets as major factors constraining the competitiveness of the South African avocado industry. Economies of scale, availability of natural resources, flow and use of information from consumers, and management of information from suppliers are factors identified by participants as

enhancing the competitiveness of the South African avocado industry under the firm strategy, structure, and rivalry. The distribution of responses by participants is shown in figure 8.6. This figure also highlights the lack of consensus from participants with regards to firm strategy, structure and rivalry factors and the way these factors influence the competitiveness of the South African avocado value chain.

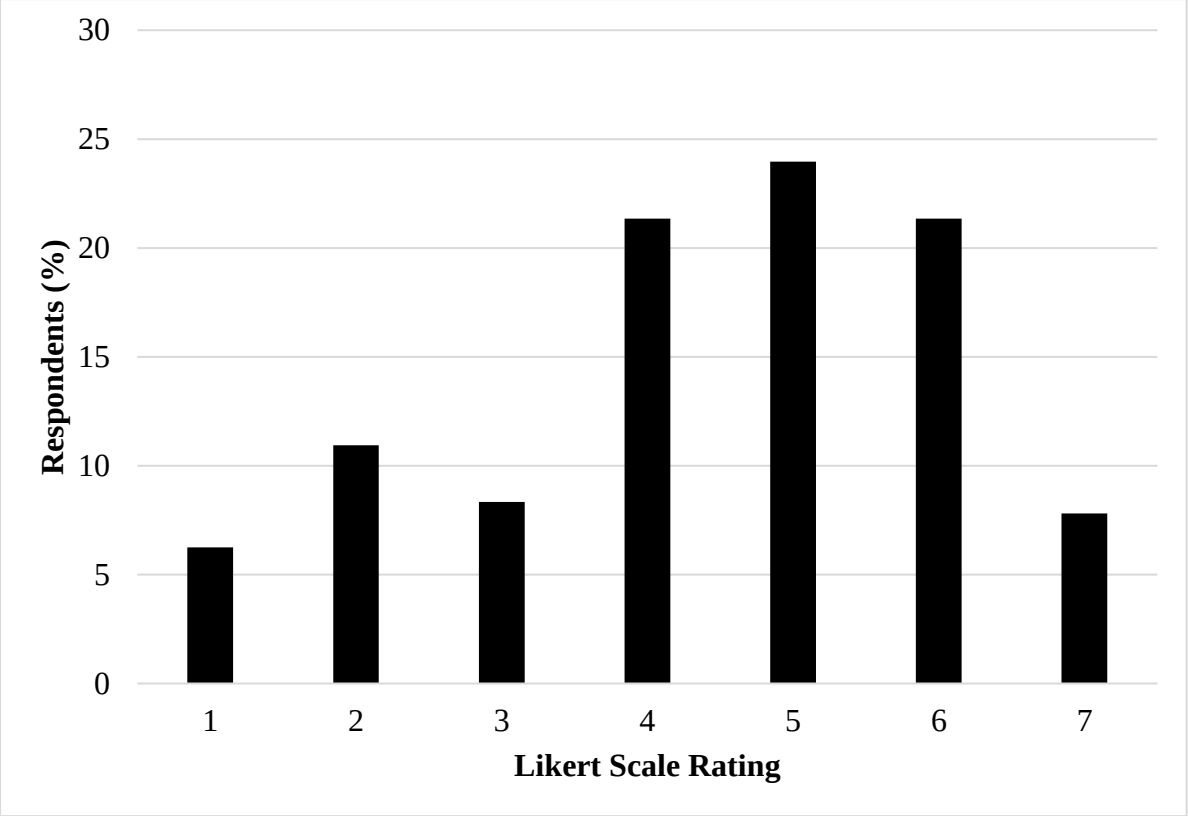

Figure 8.6: Overall responses for firm strategy, structure, and rivalry per each rating of the Likert scale

Source: Own processing of the data from SAAGA exporters survey (2021)

- ***Government support and policy (2,67 out of 7):*** this determinant was identified as the most constraining determinant out of the six used in this study to analyse the competitiveness of the South African avocado industry. South African land policies, most notable the newly proposed policy of land expropriation without compensation, labour policy, most notable minimum wages, trade policies, credibility and reliability of the current political system as factors which are constraining the South African avocado industry under government support and policy while factors such as regulatory standards and the benefits of complying with these standards were identified as the enhancing factors under this determinant. The distribution of responses from participants for this determinant is shown in figure 8.7. This figure displays a higher

level of agreeance from participants about the effect of government action on the competitiveness of the South African avocado value chain. The consensus displayed by this figure is that, government action is negatively impacting the overall competitiveness of this value chain.

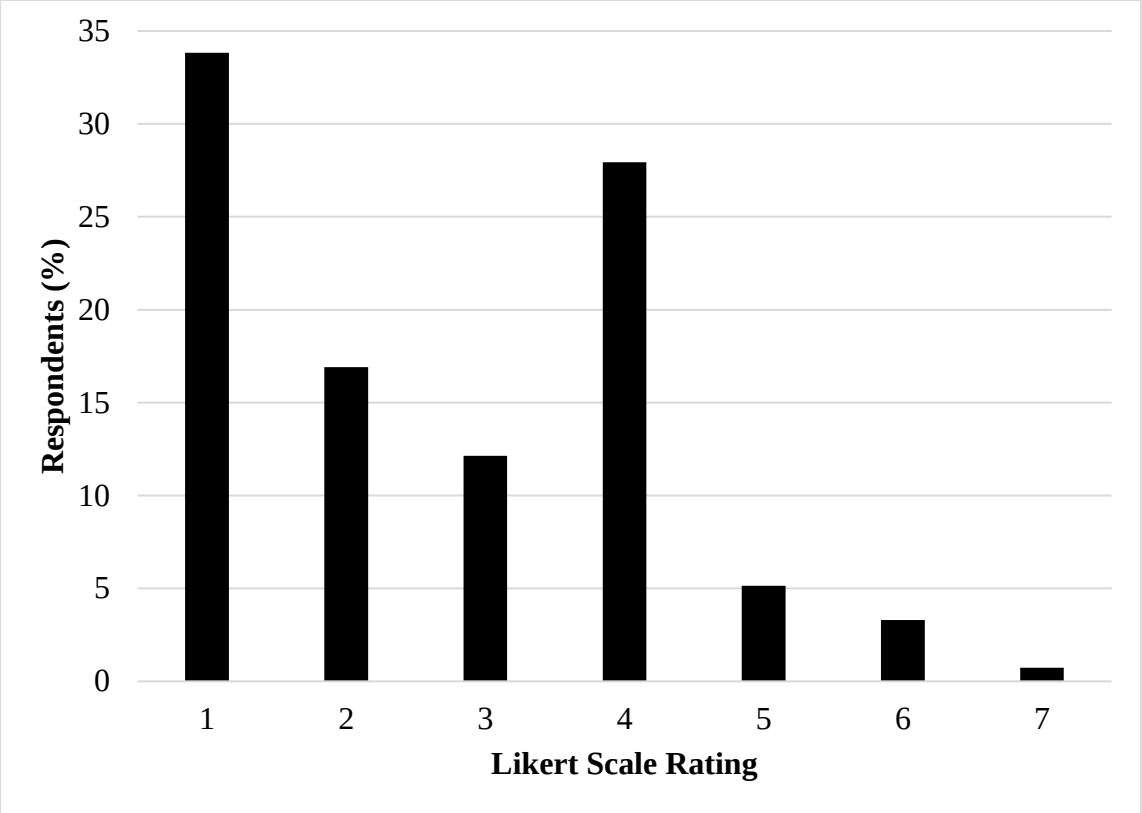

Figure 8.7: Overall responses for government support and policy per each rating of the Likert scale

Source: Own processing of the data from SAAGA exporters survey (2021)

- ***The role of chance (3,49 out of 7):*** this determinant was also identified as constraining the South African avocado industry competitiveness by the participants of this study. The cost of crime was identified as a major contribution to this phenomenon. The participants further identified that the current exchange rate and various global developments resulting from consumers about food safety had improved the competitiveness of this study. The distribution of responses by participants is shown in figure 8.8. Even though the overall weighted response of participants indicate that this determinant is slightly constraining the industry's competitiveness, the distribution of most of the responses is towards enhancing.

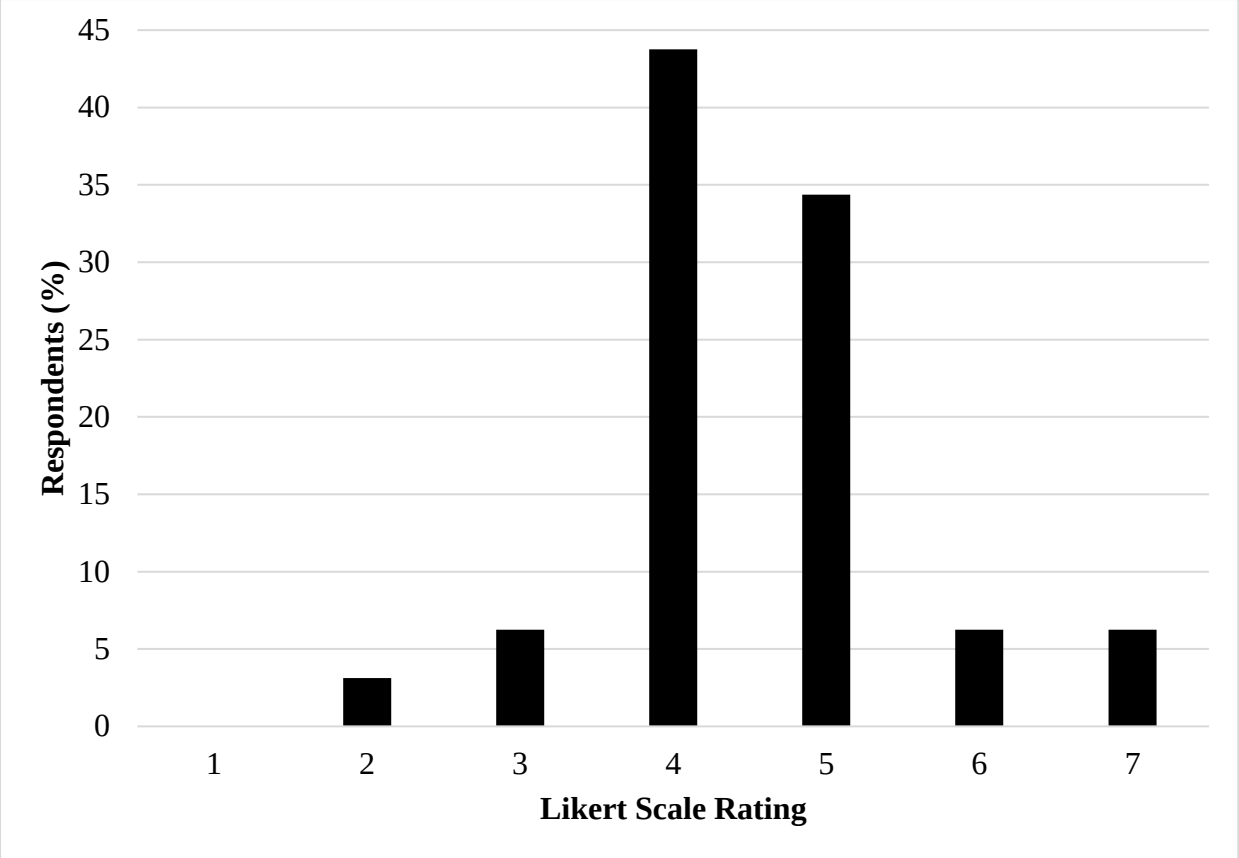

Figure 8.8: Overall responses for the role of chance per each rating of the Likert scale

Source: Own processing of the data from SAAGA exporters survey (2021)

The overall variation in the findings with regards to how the factors effect/influence the competitiveness of the South African avocado value chain which is observed when analysing the competitiveness of the South African avocado industry using the Porter's determinants of competitiveness is as a result of a number of factors which were identified by the analysis as being neutral (mean of 4). Further analysis on those factors revealed a significant variation among responses from participants. Those factors include avocado industry's expenditure on research and development, the chance or opportunities of expansion in the existing markets (local and export), competition for resources (land, information, human and capital) used by the industry versus other agricultural related activities, the flow and use of information from customers to industry participants to inform strategy, the management of information from primary input suppliers to the industry participants, complying with regulatory standards, primary funded scientific research, and the level of development for general infrastructure used by the industry participants. This variation could be caused by many factors, including the size of the operations, position in the value chain, experience of agribusiness manager, location, type of market supplying to, access and use of industry information, and marketing strategies.

Step 3: Propose strategies to enhance the competitiveness of the South African avocado value chain

From this analysis, a summary of strategic actions that the industry participants could use to improve the competitiveness of the South African avocado industry were developed (table 8.3). A full description of some of the strategic actions will be provided in chapter 9.

Table 8.3: Proposed strategies to enhance the competitiveness of the South African avocado value chain

Production factor conditions	• Attract and training of skilled labour • Development of new varieties suitable for new environmental conditions
Demand conditions	• Opening of new local marketing channels • Effective marketing of avocado in the local markets • Taking a full advantage of the changing consumer buying patterns
Relating and supporting industries	• Adopt electricity cost saving measures • Use of alternative energies (eg Solar) to minimize the challenges of electricity • Establishment of efficient logistics and distribution channels
Firm strategy, structure and rivalry	• Establishment of the South African avocado industry strategic plan • Innovation through value chain collaboration
Government support and policy	• Funding of new research • Access to new export markets • Improvement of infrastructures and seaports
The role of chance	• Align production methods with new global development

Source: Own processing

8.5 Conclusion

The Six Porter's determinants of competitiveness, namely production factor condition, demand condition, relating and supporting industries, firm strategy, structure and rivalry, government support and policy, and the role of chance were used to analyses the competitiveness of the South African avocado industry using the views of the industry participants who are SAAGA members. Industry participants and experts in this study identified government interventions and policies as the most constraining determinant while relating and supporting industries was identified as the most enhancing determinant.

Most of the factors in this analysis were identified as constraining the South African avocado industry's competitiveness, with the most constraining ones being climate change, competition in the international markets, threats of new entrance competitors in the international markets, South African land policies, new political system, electricity cost and supply, higher costs of industry specialized infrastructure and crime. Relationships with local retailers, availability and quality of storage and packaging facilities, changing consumer food preferences, economies of scale, effective management of the cold chain and technological advancements are some of the factors which are enhancing the competitiveness of this value chain.

When analysing the top factors that were identified as either enhancing or constraining the competitiveness of the South African avocado value chain, there seem to be a clear consensus amongst participants with regards to their effects/influence on the competitiveness of this value chain. On the other hand, when analysing all the factors that were identified as either enhancing or constraining the competitiveness of the South African avocado value chain using Porter's six determinants of competitiveness, there seem to be a lot of variation in terms of responses provided by participants. This was because the analysis revealed a number of factors which were classified by the analysis as being neutral but upon further analysis, it was revealed these factors were neutral because of the lack of consensus in the responses received from participants. Those factors include avocado industry's expenditure on research and development, the chance or opportunities of expansion in the existing markets (local and export), competition for resources (land, information, human and capital) used by the industry versus other agricultural related activities, the flow and use of information from customers to industry participants to inform strategy, the management of information from primary input suppliers to the industry participants, complying with regulatory standards, primary funded scientific research, and the level of development for general infrastructure used by the industry participants.

The findings of this study can be further improved by conducting a study that will try to understanding why the is a lack of consensus with regards to the most of the factors which were identified as negatively/positively affecting the competitiveness of the South African avocado industry by the value chain participants. This kind of research can help the researcher(s) to identify different groups according to the way they view the factors that are affecting the competitiveness of this value chain and this could result in the researcher(s) having to make recommendations which are group specific.

Based on the results of this analysis, it is evident that the South African avocado industry is experiencing a number of issues, which have impacted the competitiveness of this industry, especially when it comes to the export markets. A number of strategic actions were recommended that could be used to improve the competitiveness of this industry. These strategic actions can be applicable to a number of individuals, namely agribusiness managers, industry association (SAAGA) and the government.

CHAPTER 9: CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

The main objective of this study was to provide a detailed competitiveness analysis of the South African avocado value chain with an aim of proposing strategic actions that could be used by the value chain participants to make this value chain more competitive. An analytical framework for conducting a detailed competitiveness analysis for productive value chains was developed as part of this study and it was used to conduct a detailed competitiveness analysis of the South African avocado value chain. In this final chapter, strategies to improve the competitiveness of the South African avocado industry are proposed based on the findings of previous chapters, and also the effectiveness of the newly proposed analytical framework is discussed.

9.2 Summary of findings

This study was able to provide a detailed competitiveness analysis of the South African avocado value chain highlighting the complexity of this value chain, business trends, challenges constraining the competitiveness of this value chain, and the opportunities which could be used to develop strategies to improve the competitiveness of this value chain. The literature reviewed in this study revealed that there is no exact methodology and definition for competitiveness. Both of these are subject to the way in which organization/industry being dealt with view competitiveness, and also, they are influenced by the objectives of the study being carried out. Through consultations with industry participants (mainly agribusiness managers, producers, packhouses and exporters) and/or the industry association, which is SAAGA, and also through relevant local and international literature analysis, the definition of competitiveness that was adapted as part of this study was:

"The ability to expand the trade of the South African avocados relative to its competitors in order to attract investment and other scarce resources to achieve sustainable returns."

To achieve the main objective of this study, a ***7-Steps-6-Analyses*** analytical framework was developed and used by the researcher.

Analyses one (Chapter 3) and two (Chapter 4) served as an inquiry part of this study were knowledge regarding the structure of the South African avocado value chain, the number and the type of actors in this value chain, flow of avocados, major processes within this value chain,

relationships between actors in this value chain and how these relationships are developed and maintained, and the factors which are responsible for the inefficiencies within this value chain were identified by these analyses. Analysis two also had a quantitative part, were some of the relationships that actors have within and outside this value chain were quantified using the concept of SNA in order to determine how these relationships influence the functioning as well as the competitiveness of actors in the South African avocado value chain. Analyses three, four, five and six were analyses that analysed different components/parts of the South African avocado value chain in order to understand the competitiveness state of this value chain and recommend strategies to improve it.

Analysis three (Chapter 5) provided a detailed quantitative analysis of the South African avocado industry using globally approved indices which are RCA, RCA1, RMA, RXA; and RTA to measure and analyse the competitiveness of this value chain overtime. Results showed that Peru, Mexico, Kenya, and Israel have a higher competitive advantage and trade performance than South Africa. This is because of various reasons; Peru has over the years emerged as the world second top exporter of Hass (after Mexico) through country's higher competitive advantage and industry's strategic development. Mexico is the world number one producer and exporter of avocados. Kenya and Israel's avocado industry have been growing at a high rate than the South African avocado industry.

Analysis four (Chapter 6) presented a detailed and more recent SWOT analysis for the South African avocado value chain. Qualitative research approach methods that involved relevant and recent literature analysis and the use of questionnaires which were sent out to South African avocado value chain participants were used for data collection. This analysis was able to put forward a more recent and detailed SWOT analysis for both industry and farm-levels for the South African avocado value chain. Lack of economic and marketing research, one export destination, major issues associated with transportation and logistics, little government support, and high transportation costs were some of the factors that were identified as having a negative influence on this industry's competitive advantage in the EU markets.

Analysis five (Chapter 7) presented an analysis of the logistics and transportation processes involved in the local and export value chain of avocados in South Africa, and how these processes affected the overall competitiveness of the South African avocado value chain. Qualitative and quantitative research approach methods were used to conduct this analysis. For the qualitative part of this analysis, the influence of the logistics and transportation processes

on the competitiveness of the South African avocado value chain were studied through the use of structured and unstructured questionnaires which were sent out to the South African avocado exporters who are SAAGA members, and Port Managers and Harbourmasters of the five major seaports in South Africa. The quantitative part involved the use of three indices which are GCI 4.0, LPI and Ease of doing business index to measure and analyse the logistics trade quality for the South African avocado value chain and compared it with that of the industry's major global rivals in the avocado export markets. The costs of transportation and logistics were identified as the major constraint of competitiveness for the South African avocado export chain. Risks which are associated with the handling of this produce during the process of exporting was revealed as one of the major causes of the constrains identified during this analysis. This analysis was able to conclude that the overall competitiveness of the South African avocado value chain is negatively affected by the transportation and logistics processes responsible for the movement of the avocados from South Africa to the local and international markets. This analysis identified three major constraints that negatively affected the competitiveness of the South African avocado industry, and those constraints are infrastructure constraints, input costs, and regulation problems. Also factors which are also affecting the competitiveness of the South African avocado industry as result of transportation and logistics processes include port inefficiencies, poor port management, higher transportation costs, one major port for exporting avocados from South Africa and improper logistics and transportations which results in delays that negatively affect the quality of this fruit.

Analysis six (Chapter 8) provided a detailed competitiveness analysis of this value chain. Through engagements with industry participants and experts 90 factors were identified as having an influence on the South African avocado value chain's competitiveness. After an analysis on these factors using Porter's Determinant of Competitiveness, it was established that the South African avocado industry is currently facing competitiveness issues. Climate change, competition in the international markets and a number of South African policies were identified as major constraints for the competitiveness of the South African avocado value chain.

Throughout the course of this study, there was a lack of consensus amongst participants when it comes to a significant number of the factors and how those factors influence their competitiveness and the overall competitiveness of the South African avocado value chain. This variation can be as a result of many reasons which might include the experience of participants, position in the value chain, type of producer, size of operations, the way they receive and use industry information and type of markets they supply their avocados to.

9.3 The current state of the South African avocado value chain competitiveness

The overall findings of this study have suggested that the South African avocado value chain is facing various issues which are negatively affecting the competitiveness of this value chain. Those issues are as a result of many bottlenecks (Chapter 3, Section 3.4.2) which are negatively affecting the functioning of this value chain, lack of information pertaining the actors and the relationships between them, inefficiencies which are as a result of the transportation and logistics processes in this value chain, little governmental support, intense competition from global rivals, lack of innovation both at the industry and firm levels, and uncertainties which are as a result of existing and newly proposed governmental policies.

On the other hand, this study revealed that in terms of production and supplying of the avocados to various channels by the South African avocado industry, this industry has been experiencing a steady growth. Since the South African avocado industry is export oriented, with about 50-55% of its total production being supplied to the export markets and the fact that many actors in this value chain have described that the economic sustainability of this industry as being highly dependent on its trading performance, this study was able to show that both in terms of demand by consumers and supply by the South African avocado industry in these markets, there has been a steady growth as well.

The main problem which this industry/value chain is facing, is the intense increased level of competition it has been experiencing from its global rivals in the EU and UK markets which are this industry's major export destinations. Peru and Kenya were revealed as South Africa's top rival in these markets. The following sub-section (9.4) will put forward strategic actions that could be used by the most important players in the South African avocado value chain, such as agribusiness managers, producers, exporters, seaports and SAAGA in order to improve the competitiveness of this value chain.

9.4 Strategies to improve the competitiveness of the South African avocado industry

This study gave rise to 13 strategic actions that could be used by the most important players in the South African avocado value chain, such as agribusiness managers, producers, exporters, ports and SAAGA in order to improve the competitiveness of this value chain, especially in relation to export markets.

Value chain collaborations: Value chain mapping (Analysis one) revealed the lack of collaborations amongst the South African avocado value chain actors. A study by Hardman *et al*. (2002) was able to show the possibility of increasing the competitiveness of the South

African apple export chain through collaborations among producers, packers, and exporters. Since this industry is export oriented, effective collaboration amongst value chain actors is recommended for optimal performance which could result in increasing the state of competitiveness. This will require the industry to have full complete understanding of the networks that exist within this chain and identify efficient networks to use for effective strategic development. In order for this industry to have successful collaborations it will need to implement two out of the three levels of value chain collaboration which are: value chain information sharing, and strategic collaboration. this will require a full understanding of the different type of actors and encourage collaborations between different value chain actors based on the needs of actors that would be identified through the understanding of the type of services that might be required by those actors in order to improve their performance in this value chain.

Understanding of value chain relationships and systems: Social network analysis (Analysis two) demonstrated that having an understanding of relations that a particular actor has with other actors could result in making more effective decisions that could result in improved performance of the actor in the value chain. Understanding the relationships that are in the South African avocado industry could benefit the industry in so many ways, most notable with strategic planning and development. The success, performance and competitiveness of this value chain could be influenced by having a better understanding of the relationships between the actors of this value chain and develop strategies based on the nature of those relationships. A number of analyses and studies can be performed in order to gain a full understanding of relationships between actors in the South African avocado value chain. More research which will be focusing on the understanding of the relationships and the linkages between different actors of this value chain is needed. SAAGA needs to invest on research of this nature.

Attract and train new skilled labour: Throughout this study, the shortage of skilled labour was a factor that came up many times. Industry players and experts revealed that this industry is experiencing lack of technological innovation and growth in terms of research due to the fact that it has not been successful in attracting new and skilled work force. According to Yussof & Ismail (2002), organizations in the world are faced with progressively more competitive environments which are as a result of fast-moving technological world. Moreover, to compete and prosper, organizations need to restructure their activities, facilities and skills tailored to the changing technologies (Yussof & Ismail, 2002). Attracting and training new skilled labour could be done in collaboration with different academic institutions, were SAAGA will recruit

graduates which will be given to their members for training in a form of internships and mentorship program. During this program, value chain players would be given a chance to identify suitable candidates. In doing so, the industry will be able to close this major gap of failing to attract skilled labour.

Development of new varieties suitable for new environmental conditions: The industry since it experiences high level of competition from its global rivals most notable Peru and Kenya in the EU and UK markets as it was demonstrated in competitiveness assessment of the South African avocado industry (Analysis three), it can try to develop varieties that it can supply to these markets later than Peru and Kenya (who are also in the Southern hemisphere). Also, to combat the effects of climate change, the development of varieties that can withstand the changes in the environment caused by climate change is needed. Innovations in new varieties have allowed grapes growers in the northern hemisphere to expand their production season (Seccia *et al.*, 2015).

Effective marketing of the avocados in the local markets: It was revealed during most of the analyses of this study that the industry has not been effective in supplying the avocados locally which has been growing as a result of many changes. These changes were as a result of a growing middle class and changing consumer buying patterns. The analyses also identified that there is a huge potential when it comes to the local markets and if actors were to find ways of taking advantages of it, this might significantly improve the functioning of this value chain which may positively influence its competitiveness. As it was indicated in the introduction, this fruit is only produced in very few regions in the countries and furthermore is very low volumes relative to the other fruits. Also in those regions, this fruit is produced at different times of the year. The has been a growing demand in a number of regions which do not produce this fruit and some of the regions they do not have NFPM or any other channels which the industry can use to supply these fruits. Therefore, as part of developing strategies to alleviate the issues which are faced by this industry in the export markets, the development of such channels will benefit the industry.

Adopt electricity cost saving measures: This is another major constrain which needs to be addressed by actors especially those who are more involved with the produce (e.g., producers, packhouse, ports). The issue of electricity is not only affecting this industry; it has been identified as a national issue. Actors that are more involved with the product will need to consider using solar energy for some parts of their operations to reduce the costs of electricity.

This main be most applied by producers and packhouses. The issue of electricity, especially supply of it, is an issue that needs to be addressed nationally.

Establishment of efficient logistics and distribution channels: The transportation and logistics processes analysis (Analysis five) revealed that the current functioning and the performance of the logistics and transporting of the South African avocado industry are significantly constraining the competitiveness of this value chain, especially when it comes to exporting this fruit to the international markets. A well-functioning transportation sector is vital to keep transportation costs at a lower level and maintain a strong international competitiveness (Fliehr, 2013). Furthermore, effective logistics require delivering the right product, in the correct quantity, in the right quality, to the right place at the right time for the correct cost (Aghazadeh, 2004). For both the local and export markets, the South African avocado needs to improve their logistics and transportation processes. If the logistics and distribution channels were to be efficient it will result in the avocados being shipped at a right time, costs and form. The industry needs to consider going back to rail when it comes to shipping of avocados to the seaports. The rail could be used during the peak of the season in order to meet up with the demand in the export markets.

Port Infrastructure improvements: Analysis five revealed the importance of infrastructure when it comes to the shipment of avocados, especially for export markets. Poor port infrastructure and port inefficiencies were identified as major constraints which are negatively affecting the function and the competitiveness of this value chain. According to the United Stated International Trade Commission (USITC) (2012), a well-developed transportation infrastructure will enable the industries to produce competitively, move, store and market their goods in domestic and export markets. In contrast, a poor infrastructure may negatively impact delivery costs and reliability (USITC, 2012). Significant improvements are needed by the South African seaports, improvements that would reduce port inefficiencies. If the seaports were to reduce inefficiencies, the supplying of avocado to export markets would be improved significantly, which might improve the competitiveness of this value chain. The government needs to focus on improving port infrastructures, information systems and management of ports. The management can be improved by forming public-private partnership when it comes to ports.

Utilizations of the other seaports: The South African avocado industry is highly depended only on the Cape Town Port for exporting their avocados to export markets. Competition can

be improved significantly if the other ports were to be made user-friendly for exporting avocados from South Africa. This could be possible through collaborations of various stakeholders who are involved in this value chain which include exporters, transport and logistics service providers, Transnet, and the government. These collaborations will involve determining ways to ship this fruit from a right port, at a right time, to a specific market while ensuring effective and efficient movement throughout until the fruit reaches the end consumers.

Align production methods with new global developments: It was noted during this study that there have been various world developments which are as a result of growing consumer concerns. These days the consumers are concerned with more than just the health benefits of the produce, but consumers require a more than product. They want safe use of land and chemicals, better labour treatment and the practice of production processes that are not damaging to the environment. Various accreditations have been created with an aim of meeting these demands by consumers. In trying to align avocado production methods with the new global developments, the industry can also develop an industry specific accreditation that will ensure that actors in the value chain are not just providing consumers with the produce but they are practicing good production processes, fair labour treatment and are responsible for the protection of the environment they are using. This accreditation will mainly be for producers who export their produce.

Research: The industry participants revealed that, the industry tends to focus more on technical research and in the process they "neglect" economic research. This has made it difficult to implement some of the findings from those researches since actors are not presented with the financial benefits and loses associated with each technical research. To improve the competitiveness, more research collaborations are needed between technical and economic researchers involved for this industry.

New markets: Throughout this study it was also revealed that the South African avocado industry is mainly depended on two major export destinations which are the EU and UK markets. As part of improving the performance and competitiveness of this value chain, the industry needs to have access to new export markets. The industry could consider mostly exporting to the Asian countries as these countries have huge populations with high demand for fresh produce. When accessing new markets, the industry needs to study those markets in terms of demand, quality required, buying patterns so that industry participants will be able to meet up with the demands of consumers in those markets.

Establishment of the South African avocado industry's strategic plan: The industry needs to be able to synthesis all the research that is conducted and presented in its annual research symposium and use it to produce a document that will have strategic actions that would be based on the findings of those various studies for that year. This could include additional research which is funded by SAAGA and other relevant research which has been conducted by both by the public and/or private institutions. This will involve gathering all the findings from all the studies/research and document it in such a way that it will give industry participants a chance to implement the findings on their operations.

9.5 Effectiveness of the newly proposed analytical framework used in this study

This study was able to present a new method for conducting a much-detailed competitiveness analysis for productive value chains, and this method was used to conduct a detailed competitiveness analysis for the South African avocado value chain. The ***7-Steps-6-Analyses*** framework proved to be effective by analysing various parts of the value chain in order identify how those parts affected the functioning and the competitiveness of the overall value chain.

This analytical framework is composed of six components or tools which enables it address various aspects of a value chain in order to provide a detailed competitiveness analysis. These six components are: the inquiry part of the study; identifying and analysis certain behaviours which influences decision making in the chain; quantitative; qualitative; comparative; and evaluation as shown in figure 9.1.

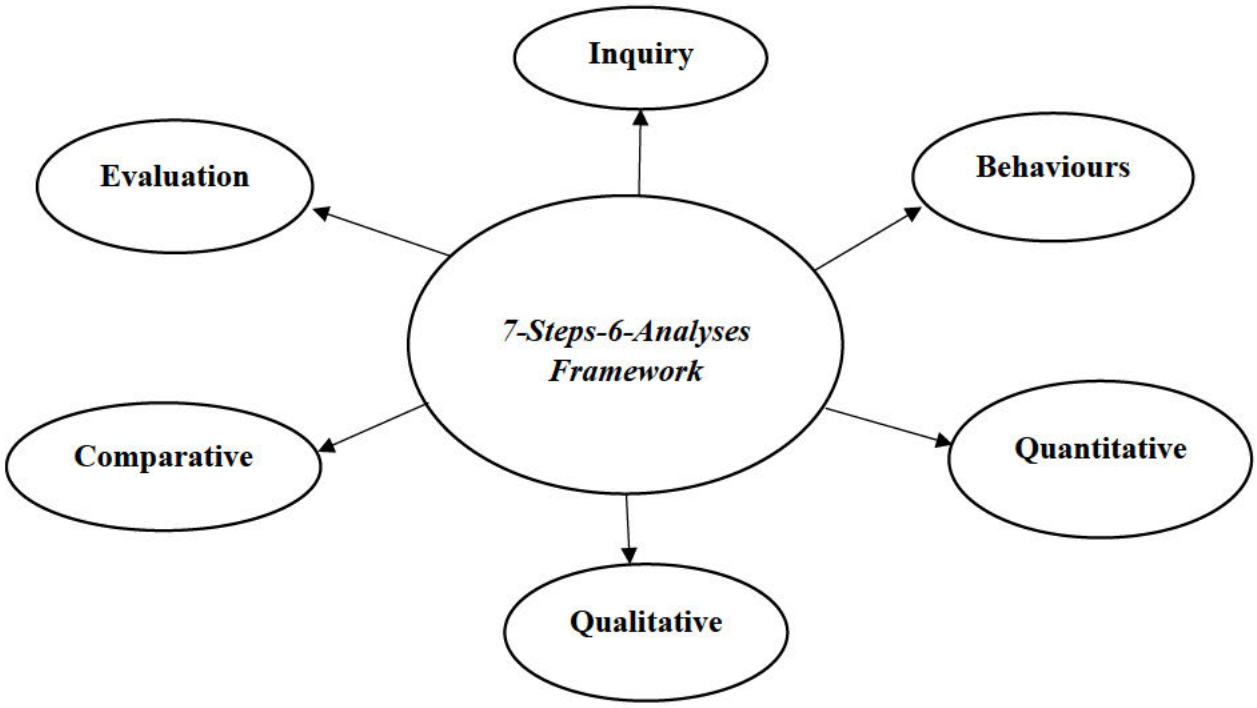

Figure 9.1: Components which make up the proposed analytical framework and are responsible for its effectiveness

Source: Own processing

These components allow this analytical framework to provide a more detailed competitiveness analysis as follow:

Inquiry: This component involves the gathering of knowledge pertaining the value chain that is being analysed. Information about the actors, processes, and organization of the value chain is all gathered as part of this component. This provides the insight and the state of the value chain for the researcher(s). The information gathered here serves as background information which is also used to address the other components as well.

Behaviours: From the information obtained during the inquiry component, the researcher(s) can study many behaviours observed in the value chain that is being studied. Having an understanding of certain behaviours by actors in the value chain will help with an understanding of certain decisions made by actors and this could be used to develop more effective strategies.

Qualitative: This component involves the gathering and analysing the factors which are put forward by value chain participants as either positively or negatively affecting the functioning and the competitiveness of the value chain that is being studied. This enables the researcher(s) to separate these factors into two groups (positive vs. negative) and use such information as foundation for proper strategic development.

Quantitative: The aim of this component is to quantify some of the factors and the behaviours which were identified in the other two components of this analytical framework through a use of local and/or international indices and techniques. This is done to gain a full understanding between state in which the actors view these factors to be vs. how do these indices or measuring techniques reveal them to be.

Comparative: This component aims to provide various comparisons for the value chain that is being analysed. These comparisons may be between actors in the same value chain, comparisons of the value chains of different commodities and/or comparisons of value chains of the same commodities but different countries.

Evaluation: This component involves the gathering and analysing of all the information gathered from all the other components for a much in-depth analysis by the researcher(s) in order to understand the state of the competitiveness of the value chain that is being analysed then use such information for more effective strategic developments.

These components make up the analyses which are a part of the ***7-Steps-6-Analyses*** framework and give the overall analytical framework a unique edge which enables it to perform its duties which are to assist researcher(s) to conduct a more detailed competitiveness analysis of a productive value chain. Each analysis involved in this framework is made up of one or more of the components above. As a result of using this analytical framework, this study was able to show an overview of the current competitiveness state of the South African avocado industry/value chain and proposed strategic actions for the value chain participants to improve the current competitiveness state and also prepare the industry for future projected intense competition from global rivals.

9.6 Concluding remarks

In the process of trying to recommend strategic actions that could be used to address the factors that are responsible for the current state of competitiveness of the South African avocado industry, various new information was put forward by this study. This study was able to put forward an improved and a much-detailed structure of the South African avocado value chain, and this structure highlighted all the actors, activities, processes and the main functions performed by the actors in this value chain. A structure of this nature can be used as a road map in trying to obtain different information regarding the South African avocado industry. Unlike previous value chain mapping studies mainly those conducted by Neves and various co-authors, this study was mostly concerned about producing a detailed structure rather than doing

both mapping and quantification. This also resulted in the researcher putting forward a systematic analytical framework which could be used to conduct value chain mapping analysis for producing a much-detailed structure of any productive value chains.

In relation to other South Africa value chain competitiveness studies such as those conducted by Esterhuizen *et al*. (2002), Esterhuizen (2006), Esterhuizen & Van Rooyen (2006), Ndou & Obi (2011), Van Rooyen *et al.* (2011), Jafta (2014), Angala (2015), Boonzaaier (2015), Abei (2017), Dlikilili (2018), Sibulali (2018), Barr (2019), Noyakaza (2019), Nkamisa (2020) and Simelane (2021), this study was able to perform a more detailed value chain competitiveness analysis by using the newly proposed ***7-Steps-6-Analyses*** framework which is made up of six analyses which were analysing the competitiveness of the value chain in various parts of the value chain.

This study also differs from the other South African value chain competitiveness studies (mentioned above) because in trying to provide a detailed competitiveness analysis of the South African avocado industry/value chain:

- This study was also able to provide information about the importance of social networks and how they influence the performance, functioning and the competitiveness of actors in the value chain,
- This study was able to provide the state of the South African avocado industry's competitiveness in comparison with that of its major global rivals in the export markets,
- This study was able to provide a more improved and detailed SWOT analysis for this industry was developed,
- Finally, this study was able to reveal the influence of the transportation and logistics processes on the competitiveness of this value chain.

9.7 Limitations of the study

Due to the scope and time constraint, this study gathered information mostly through census and other research techniques involving avocado value chain actors who are only members of SAAGA. For this study also, majority of participation, especially amongst producers, was from large producers, and those producers who were classified as producing, packaging, processing and marketing avocado firms. This could be due to the nature in which data was collected, and the way in which these SAAGA actors viewed competitiveness and its importance. A different perspective would have been introduced if the study also consisted of participants who are not SAAGA members, especially producers.

9.8 Recommendations for further research

This study was able to showcase the lack of consensus from all actors involved from all levels of this value chain. The findings of this study can be further improved by conducting a study that will try to understand why there is a lack of consensus with regards to the most of the factors which were identified as either negatively/positively affecting the competitiveness of the South African avocado industry by the industry participants. This will help the researcher(s) to identify different groups according to the way they view the factors that are affecting the competitiveness of this value chain and this could result in the researcher(s) having to make recommendations which are group specific.

The analytical framework that was developed and used for this can be further improved by incorporation two additional analyses which could result in an even more detailed competitiveness analysis and those two analyses are *value chain integration* and *value chain fragility*. Value chain integration and value chain fragility were recommended as further analysis to be conducted in order to improve the finding of this study because these two analyses would further provide competitiveness analysis in additional parts or aspects of this value chain. For example, opportunities for value chain integration that could be used to promote cooperation and innovation for value chain participants aiming at improving the competitiveness of the overall South African avocado value chain. Value chain fragility would be used to identify all the risks and uncertainties which are negatively impacting the overall competitiveness of this value.

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APPENDICES

Appendix A: Ethical Clearance Letter

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

22 September 2021

Sibonelo Zwane (216002915)
School Of Agri Earth & Env Sc
Pietermaritzburg Campus

Dear S Zwane,

Protocol reference number: HSSREC/00003135/2021
Project title: Competitiveness analysis of the South African avocado value chain.
Degree: MSc

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 27 July 2021 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 22 September 2022.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)

/dd

Humanities and Social Sciences Research Ethics Committee
Postal Address: Private Bag X54001, Durban, 4000, South Africa
Telephone: +27 (0)31 260 8350/4557/3587 **Email:** hssrec@ukzn.ac.za **Website:** http://research.ukzn.ac.za/Research-Ethics
Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

INSPIRING GREATNESS

Appendix B: Survey and Interview Questions for SNA Case Study

This **questionnaire** is strictly confidential and will be used for research purposes by staff and students at the University of KwaZulu-Natal. The information will be used for MSc Agric study titled "**Competitiveness analysis of the South African avocado value chain**". The is no wrong or right answers to these questions.

Participation is voluntary and there is no penalty or loss of benefit for non-participation. Being in this study is voluntary and you are under no obligation to consent to participation. You are free to withdraw at any time during the completion of the questionnaire without giving a reason.

Name Generator

- Elicit alters name
- Alter's roles
- Alter's interactions with one another (0= No interaction; 1= Interaction)

Name interpreters

- Alter's characteristics
    - Business location (scale **1-5**; 1=SAME LOCATION, 5= DIFFERENT LOCATION)
- Level of involvement in the produce (scale **1-5**; 1= DIRECT, 5 = INDIRECT)
- Service requirement (scale **1-5**; 1= MORE FREQUENTLY, 5= LESS FREQUENTLY)
- Reliability (scale **1-5**; 1= MORE RELIABLE, 5= LESS RELIABLE)
- Availability (scale **1-5**; 1= IMMEDIATELY, 5= LONGER WAITING PERIOD)
- Trustworthy (scale **1-5**; 1= Trustworthy; 5= Less trust work)
- Socializing (scale **1-5**; 1= MORE FREQUENTLY, 5= LESS FREQUENTLY)
- Role in the functioning of your operations (scale **1-5**; 1 MORE IMPORTANT, 5= LESS IMPORTANT)
- Effect on your competitiveness (scale **1-5**; 1= HIGH, 5= LOW)

- Level of trust (scale **1-5**; 1= HIGH, 5= LOW)
- Level of competition (scale **1-5**; 1= HIGH, 5= LOW)
- Level of collaboration (scale **1-5**; 1= HIGH, 5= LOW)
- Exchange of information (scale **1-5**; 1= HIGH, 5= LOW)

Thank you very much for taking your valuable time to participant in this interview. Your participation is highly appreciated

Appendix C: Questionnaires

Questionnaire One: *SWOT Analysis*

The information to be captured in this questionnaire is strictly confidential and will be used for research purposes by staff and students at the University of KwaZulu-Natal. The information will be used for MSc study titled "**Competitiveness analysis of the South African avocado value chain**". There are no wrong or right answers to these questions.

Participation is voluntary and there is no penalty or loss of benefit for non-participation. Being in this study is voluntary and you are under no obligation to consent to participation. You are free to withdraw at any time during the completion of the questionnaire without giving a reason.

Answer where it is applicable.

INDUSTRY LEVEL SWOT ANALYSIS

Strengths

1. What operations does the industry perform well? (marketing, producing commercial, exporting, etc.)?
2. What do other fruit industries (Apple, Orange, etc) see as your strengths?
3. Is the industry's marketing and advertising effective? (buyers indicate that they saw your industry on the internet)
4. Why do your customers especially the international ones, are purchasing South African avocados? (Consistent quality, advertising,)
5. What have been the most notable achievements for the South African avocado industry?

Weaknesses

1. What operations you do not perform well?

2. What do other fruit industries (Apple, Orange, etc) see as your weaknesses?
3. What is/are the industry's least profitable enterprises? (fresh produce, processing, nursery)
4. Do you think that your global competitors have a greater competitive advantage than you due to their location, government policies and technology?

Opportunities

1. What new technologies are available that the industry operations can use to lower costs or improve marketing?
2. What market trends are you observing?
3. What new relationships can the industry develop? (join an Internet marketing association)
4. Can a competitive edge be created over the industry competitors? (add a value-added product,)
5. What can the industry do that it is not currently doing to improve the operation?
6. What new government policies and programs are available?
7. What interesting social patterns, population profiles, and lifestyle changes are occurring that could benefit the industry operation?

Threats

1. Have there been any significant changes in the South Africa avocado industry that you deem to be threating?
2. What obstacles does the industry face?
3. What is the industry's competition doing? (Entering new markets, adapting new technologies, advertising on the internet)
4. Are there any, or do you anticipate any, new competitors in the industry's local and export market?
5. Are there any, including new, regulations in the industry that make it difficult to be profitable? (state approval for processing, collection, and sale of fresh produce)

6. Are international or distant competitors taking/reducing the industry's market share? Is the industry keeping up with technological changes? (updated computers, software, and Internet)
7. Is changing technology threatening the industry's profitability?
8. Are there governmental (or farmer cooperative) decisions that affect the industry's production or markets? (not repairing or widening local roads and bridges, environmental restrictions/regulations, free-trade agreements that allow products to be shipped into your market)
9. Could any of the industry's weaknesses seriously threaten the operation?

FIRM LEVEL SWOT ANALYSIS

Strengths

1. What operation do you perform well? (marketing, producing commercial, exporting, etc.)?
2. What do other people (neighboring farmers, competitors) see as your strengths? (large farm size, own warehouse, do you own processing, do your own transporting)
3. What are the major sources of the business's revenue and profit?
4. Is the firm's marketing and advertising effective? (buyers indicate that they saw your firm on the internet)
5. What have been the most notable achievements?
6. What relevant resources does the firm have? (warehouse, water resources, storage facilities)
7. Is the moral of the employees high? Are there incentives in place to reward employees for good work? (bonuses, extra paid leave, share of the profits)
8. What is the firm's greatest asset?

Weaknesses

1. What operations you do not perform well?

2. What do other people (neighboring farmers, competitors) see as your weaknesses? (credit card debts, mixed and inconsistent production)
3. What is the biggest expense of the operation?
4. Why do customers not buy from the firm? (located far,)
5. Is labor short during peak harvest season?
6. Is there an opportunity to receive higher prices for production?

Opportunities

1. What new technologies are available that the firm operation can use to lower costs or improve marketing? (improved forage varieties to extend seasons, tele-auctions)
2. What new relationships can the farm develop? (join an Internet marketing association)
3. Can the quality of products, operations, and inventory management be improved without incurring serious costs?
4. Can a competitive edge be created over the firm's competitors? (add a value-added product, add a performance tested buck)
5. What can the firm do that it is not currently doing to improve the operation?
6. What interesting local events might benefit the firm operations?

Threats

1. What obstacles does the firm operation face?
2. Are international or distant competitors taking/reducing the firm's market share? Is the farming operation keeping up with technological changes? (updated computers, software, and Internet)
3. Is changing technology threatening the firm's profitability?
4. Are there governmental (or farmer cooperative) decisions that affect the firm's/industry's production or markets? (not repairing or widening local roads and bridges, environmental restrictions/regulations, free-trade agreements that allow products to be shipped into your market)
5. Could any of the firm's weaknesses seriously threaten the operation?

If you would like to be called to participate in follow up interviews, please provide your information below.

Name of Respondent:

Company Name:

Contact number:

Email address:

Geographical Area: (District/Municipality)

Thank you very much for taking your valuable time to complete this survey. Your response is highly appreciated

Questionnaire Two: *Transportation and Logistics Processes Analysis*

UNIVERSITY OF KWAZULU-NATAL ™

INYUVESI YAKWAZULU-NATALI

The information to be captured in this questionnaire is strictly confidential and will be used for research purposes by staff and students at the University of KwaZulu-Natal. The information will be used for MSc study titled "**Competitiveness analysis of the South African avocado value chain**". There are no wrong or right answers to these questions.

Participation is voluntary and there is no penalty or loss of benefit for non-participation. Being in this study is voluntary and you are under no obligation to consent to participation. You are free to withdraw at any time during the completion of the questionnaire without giving a reason.

RESPONDENT INFORMATION

(Avocado exporters)

Company information

Which areas of activity of your company?

What is the annual volume of avocados traded?

EXPORT PROCESS

1. Please describe the export process (from production to port)
2. What is the travel distance to port?
3. What is the medium time of travelling from origin (warehouse) to destination (port)?
4. How long does it take to load, travel and unload the vehicle?
5. Which is the condition of the regional infrastructure and how does it affect the overall process of transportation?
6. Which are the logistic risks in exporting avocados and which is the rate of losses per year?
7. During the transportation process in which phase(s) does losses occur and why?

LOGISTIC COSTS

1. Please specify the company's costs related to avocado logistics (freight, storage, transshipment, port). (Per ton/ Per carton/ Per year)
2. Which factor constrains most in the logistic costs (freight, transshipment, port costs)?
3. How is the freight price composed and which are major determinates and cost factor?
4. Does waiting time at the port impact on the transport costs? How?

TRANSPORTATION

1. Do you own you own transport to transport avocados from warehouse to port?
2. What type of transport do own/use to transport avocados to port?
3. Average utilization of fleet in 1 year (%)? How many days per year does one truck stand still?
4. Renovation of fleet- After how many years do you renew your fleet?
5. Which are the major problems of maintenance?
6. Is maintenance outsourced?
7. Are the return travels used for the transportation of goods? Please specify

Transportation Constraints

(Please classify the constraint by its effected in each category)

	Infrastructure Problems	**No Obstacle**	**Minor Obstacle**	**Moderate Obstacle**	**Major Obstacle**	**Very Severe Obstacle**
1	Missing links in the road					
2	Poor road condition					
3	Congestion on main roads					
4	Congestion around major population centres/cities due to lack of bypasses or alternative routing					
5	Restrictions on periods of time for entering in large cities					
	Input Costs					

6	Cost of vehicles					
7	Cost of maintenance and spare parts					
8	Fuel costs					
9	Labour costs					
10	Lack of backload					
11	Road accidents					
12	Corruption and roadblocks					
13	Crime and security					
14	Tax rates					
15	Tax administration					
	Regulation Problems					
16	Regulation and licences					
17	Freight allocation					
18	Border-crossings					
19	Practices of competitors in the informal sector					
20	Stopping time for inspection					
21	Phytosanitary regulations					
	Labour Problems					
22	Inadequately trained work force					
23	Health problems of drivers					

Of the following 4 types of actions, which one would be your first priority?

Invest in new road infrastructure	
Invest in existing road rehabilitation	
Reduce input costs	
Ease regulations	

Why?

STORAGE

1) Please describe the warehousing infrastructure of the region and of your company?
2) Please specify the costs of storage for the warehouse operator
3) Do you have on farm warehouses?

OTHER

1) Is bureaucracy a limiting factor to the process flow?
2) Is the any government support?
3) Where do you see major bottlenecks or challenges in the logistics processes?
4) Please describe the development of the transport sector over the last five to tens years and how has these developments affected the avocado export value chain?
5) Please describe the development of the transport sector over the next five to ten years and how will these changes influence the competitiveness of the South African avocado export chain?

Thank you very much for taking your valuable time to complete this survey.

Your response is highly appreciated

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RESPONDENT INFORMATION

(Port/logistic Management)

Name of Respondent:

Contact number:

Email address:

Geographical Area: (District/Municipality)

1) Whom do you regard as your target group? (Agricultural exporters or any exporting companies)
2) Can you present overview of the working process involves with avocados that are exported from your port?
3) What kinds of equipments and services in those functions have adopted national and industrial standards?
4) Does the shipment of avocados require specialized resources which differ from the shipment of other fruits?
5) What is the maximum storage capacity of avocados at a given point in time?
6) How do you collect feedback from your customers?

7) What are the advantages and disadvantages of modern related new technologies on avocado export logistics?
8) As new logistics models are coming up, which models have you already adapted and which will be adapted in the near future?
9) What are the biggest risks and threats to avocado exporting, and how do you deal with them in daily business life?
10) What will be the most important strengths and strong points in your logistics process in the future?
11) As the avocado industry continues to grow, do you think your port will be able to deal with this growth? Does the port have capacity to expand avocado export operations in the future?
12) What do you regard as major problems/challenges when dealing with the shipment of avocados?
13) What do you think can be done by the Port industry to enhance the competitiveness of the South African avocado industry?
14) Which of the following factor do you think need to be maintained/pay more attention in order to allow for efficient shipment of avocados that would result in a positive effect of its export chain?

1= less attention, 4= neutral, 7 = pay more attention

Port Logistics factors	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Terminal operation services							
i. Container Terminal Operations							
ii. Loading and Discharging Operations							
iii. Storage Operations in Container Yard							
Port security services							
i. Management of Port Security							
ii. Port Security Planning							
iii. Seaport Terrorism Awareness							
Port organization and management							
i. Strategic Planning							
ii. Business Planning							
iii. Port Reform Issues (Privatisation, Corporatisation, Liberalisation)							

iv. Policies and Procedures							
v. Port Economic Impact Assessment							
Finance							
i. Management of Port Finance							
ii. Supervision of Port Finance							
iii. Port Accounting/Auditing							
iv. Purchasing and Procurement Management							
Information Technology and trade facilitation							
i. Computerized Cargo Handling Trading Systems							
ii. Computerized Gate Receipt/Delivery Systems							
iii. Computerized Maintenance Systems							
iv. Vessel Operations/Computerized Storage							
v. Auto Computerized Processing System							
Transportation							
i. Supervision of Container Freight Operations							
ii. Data Gathering and Analysis							
iii. Port Marketing Strategies and Approaches							
iv. Niche Marketing							

Thank you very much for taking your valuable time to complete this survey.

Your response is highly appreciated

Questionnaire Three: *Value Chain Analysis*

UNIVERSITY OF KWAZULU-NATAL ™

INYUVESI YAKWAZULU-NATALI

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Fruit type	Fresh	Dried	Processed
Mark with X where applicable			

Position in the value chain	Input or Service Provider	Producer	Packhouse or Processor	Exporter Or Marketer
Mark with X where applicable				

Please mark only one block: 1= Negative; 4= Neutral; 7 =Positive

Additional space will be provided for supporting comments if necessary

PRODUCTION FACTOR CONDITIONS

1) The general infrastructure used by the industry is:

1= Poorly developed and insufficient; 4= Neutral; 7= Well developed and sufficient

1	2	3	4	5	6	7

Comment:

---

2) The cost of industry infrastructure is:

1= Extremely high; 4= Neutral; 7= Very affordable

1	2	3	4	5	6	7

Comment:

---

3) The cost of doing business in the industry (i.e. transaction costs) are:

1= Extremely high; 4= Neutral; 7= Very affordable

1	2	3	4	5	6	7

Comment:

---

4) The quality of research available to your industry:

1= Generally lags behind other industries; 4= Neutral; 7= Outstanding

1	2	3	4	5	6	7

Comment:

---

5) The quality of technology available to your industry:

1= Generally lags behind other industries; 4= Neutral; 7= Outstanding

1	2	3	4	5	6	7

Comment:

---

6) Access to quality technology for your industry is:

1= Difficult to obtain; 4= Neutral; 7= Easy to obtain

1	2	3	4	5	6	7

Comment:

---

7) The cost of technology is:

1= Extremely high; 4= Neutral; 7= Very affordable

1	2	3	4	5	6	7

Comment:

---

8) Would technology advancement impact competitiveness of your business?

1= Marginally improve; 5= Neutral; 9= Enhance business' competitiveness

1	2	3	4	5	6	7

Comment:

---

9) Does the changing structure of the industry (Concentration, regulations, new markets)?:

1= Negative influence; 4= Neutral; 7= Positive influence

1	2	3	4	5	6	7

Comment:

---

10) Obtaining long-term finance for your business (loan):

1= Extremely difficult and too costly; 4= Neutral; 7= Easy and very affordable

1	2	3	4	5	6	7

Comment:

---

11) Obtaining short-term finance for your business:

1= Extremely difficult and too costly; 4= Neutral; 7= Easy and very affordable

1	2	3	4	5	6	7

Comment:

---

12) Skilled labour is:

1= Difficult to obtain; 4= Neutral; 7= Easily accessible

1	2	3	4	5	6	7

Comment:

---

13) Competency level amongst skilled labour is:

1= Not Very high; 4= Neutral; 7= Is outstanding

1	2	3	4	5	6	7

Comment:

---

14) Obtaining unskilled labour is:

1= Difficult; 4= Neutral; 7= Easy

1	2	3	4	5	6	7

Comment:

---

15) The quality of unskilled labour is:

1= Not very high; 4= Neutral; 7= Very high quality

1	2	3	4	5	6	7

Comment:

---

16) Cost of hiring unskilled labour is:

1= Too costly; 4= Neutral; 7= very affordable

1	2	3	4	5	6	7

Comment:

---

17) Extend of using labour saving machinery:

1= Currently used; 4= Neutral; 7= Will be used in the future

1	2	3	4	5	6	7

Comment:

---

18) Access to natural resources (land and water) is:

1= Limited; 4= Neutral; 7= Readily available

1	2	3	4	5	6	7

Comment:

---

19) Your location's suitability for avocado production is:

1= Not suitable; 4= Neutral; 7= Suitable

1	2	3	4	5	6	7

Comment:

---

20) Establishment and production costs are:

1= Too costly; 4= Neutral; 7= very affordable

1	2	3	4	5	6	7

Comment:

---

21) The impact of local climate/weather variation (unpredicted conditions) affects your business:

1= Negatively; 4= Neutral; 7= Positively

1	2	3	4	5	6	7

Comment:

---

22) The productivity level of your industry is:

1= Very low; 4= Neutral; 7= Very high

1	2	3	4	5	6	7

Comment:

---

23) The effectivity (successful in achieving a desired result) level of your business is:

1= Very low; 4= Neutral; 7= Very high

1	2	3	4	5	6	7

Comment:

---

24) The transportation to export your product:

1= Constraints your company's competitiveness; 4= Neutral; 7= Enhance your company's competitiveness

1	2	3	4	5	6	7

Comment:

---

25) The storage (containers used to export your products:

1= Constraints your company's competitiveness; 4= Neutral; 7= Enhance your company's competitiveness

1	2	3	4	5	6	7

Comment:

DEMAND/MARKET FACTORS

1) Local (SA) market size is:

1= Unable to handle large volumes; 4= Neutral; 7= Large enough and growing in demand

1	2	3	4	5	6	7

Comment:

---

2) Local consumers preference of avocado fruit is:

1= Slow to adopt new products and processes; 4= Neutral; 7= Actively seeking out new products and processes

1	2	3	4	5	6	7

Comment:

---

3) The growth in volume of the local market is (Capacity to handle increasing volumes):

1= Very low; 4= Neutral; 7= Very high

1	2	3	4	5	6	7

Comment:

---

4) The growth in value of the local market is:

1= Too slow 4= Neutral; 7= Large enough and show increasing trends

1	2	3	4	5	6	7

Comment:

---

5) Consumer education and availability of information, to base marketing decisions on, is:

1= insufficient; 4= Neutral; 7= Adequate

1	2	3	4	5	6	7

Comment:

---

6) **The international avocado fruit export market is:**

1= Too small; 4= Neutral; 7= Large enough

1	2	3	4	5	6	7

Comment:

---

7) **The diversity (based on volume and variety) of new (more lucrative) international markets are:**

1= Similar; 4= Neutral; 7= Varied

1	2	3	4	5	6	7

Comment:

---

8) **The influence of adverse weather conditions on buying patterns of avocados in export market:**

1= Depended/Has impact; 4= Neutral; 7= Independent/no impact

1	2	3	4	5	6	7

Comment:

---

9) **Seasonality and availability of the South African avocado fruit impacts the industry's competitiveness:**

1= Negatively; 4= Neutral; 7= Positively

1	2	3	4	5	6	7

Comment:

---

10) **The available and characteristics (profile and product) of the SA avocado fruit on offer, in line with market demand:**

1= Insufficient; 4= Neutral; 7= Sufficient

1	2	3	4	5	6	7

Comment:

---

11) The South African avocado industry's relationship with mega retailers

1= Very poor; 4= Neutral; 7= Very good

1	2	3	4	5	6	7

Comment:

---

12) The chance of expansion in the existing markets is:

1= Less likely; 4= Neutral; 7= Very likely

1	2	3	4	5	6	7

Comment:

---

13) The likelihood of emerging markets increasing your firm's level of competitiveness:

1= Less likely; 4= Neutral; 7= Very likely

1	2	3	4	5	6	7

Comment:

---

14) Changing composition of food demand (food preference):

1= Constrains competitiveness; 4= Neutral; 7= Enhance competitiveness

1	2	3	4	5	6	7

Comment:

---

15) How will the proposed "Brexit" trade agreement influences your company's competitiveness:

1= Big impact; 4= Neutral; 7= Less impact

1	2	3	4	5	6	7

Comment:

---

16) **Being in the market at the same time with Northern Hemisphere competitor's affects your business's level of competitiveness:**

1= Negatively; 4= Neutral; 7= Positively

1	2	3	4	5	6	7

Comment:

RELATED AND SUPPORTING INDUSTRIES

1) **Financial services providers generally:**

1= Constrains your business's competitiveness; 4= Neutral; 7= Enhance your business's competitiveness

1	2	3	4	5	6	7

Comment:

---

2) **Privately funded scientific research institutions are:**

1= None-existence; 4= Neutral; 7= The best in their fields

1	2	3	4	5	6	7

Comment:

---

3) **Government-funded scientific institutions are (NRF, ARC etc):**

1= Doing poor job; 4= Neutral; 7= The best in their fields

1	2	3	4	5	6	7

Comment:

---

4) **Evaluation and testing of new varieties according to industry's best practices**:

1= Improper; 4= Neutral; 7= Properly evaluated and tested

1	2	3	4	5	6	7

Comment:

---

5) Access to grower-club varieties

1= Access to no programs; 4= Neutral; 7= Access to all the programs

1	2	3	4	5	6	7

Comment:

---

6) Avocado industry's expenditure on Research and Development is:

1= Insufficient; 4= Neutral; 7= Sufficient

1	2	3	4	5	6	7

Comment:

---

7) Collaboration with scientific research institutions is:

1= None-existent; 4= Neutral; 7= Intensive and continuing

1	2	3	4	5	6	7

Comment:

---

8) Electricity supply (including renewable energy and fossil fuels):

1= Constrains competitiveness; 4= Neutral; 7= Enhance competitiveness

1	2	3	4	5	6	7

Comment:

---

9) Telecommunication services:

1= Constrains competitiveness; 4= Neutral; 7= Enhance competitiveness

1	2	3	4	5	6	7

Comment:

---

10) Specialised technology services are: (computerised irrigation systems/services, smart fresh, consultants etc):

1= Not available; 4= Neutral; 7= Available from outstanding local institutions/firms

1	2	3	4	5	6	7

Comment:

---

11) The cost of specialised or hired technology services is:

1= Too expensive; 4= Neutral; 7= Very affordable

1	2	3	4	5	6	7

Comment:

---

12) Availability of local suppliers of primary inputs (Fertilisers, pesticides etc):

1= Largely non-existing and limited supply; 4= Neutral; 7= Numerous and provide all necessary input components

1	2	3	4	5	6	7

Comment:

---

13) The quality of local suppliers for your industry's primary input is:

1= Inefficient and have little technological capability; 4= Neutral; 7= Internationally competitive, innovative and reliable

1	2	3	4	5	6	7

Comment:

---

14) The sustainability of local suppliers of your industry's primary inputs:

1= Problematic; 4= Neutral; 7= No problem at all

1	2	3	4	5	6	7

Comment:

---

15) Availability of storage and packing/product handling facilities:

1= Not available; 4= Neutral; 7= Readily available

1	2	3	4	5	6	7

Comment:

---

16) The cost of storage and packing/product handling facilities:

1= Extremely high; 4= Neutral; 7= Affordable

1	2	3	4	5	6	7

Comment:

---

17) Availability and reliability of transport:

1= Unavailable and unreliable; 4= Neutral; 7= Readily available and trustworthy

1	2	3	4	5	6	7

Comment:

---

18) Effective management of cold-chain:

1= Ineffective and inefficient; 4= Neutral; 7= Effective and efficient

1	2	3	4	5	6	7

Comment:

---

19) Necessary infrastructure requirements for export purposes (Facilities in Cape Town):

1= Insufficient and hinders competitiveness; 4= Neutral; 7= Sufficient and improves competitiveness

1	2	3	4	5	6	7

Comment:

FIRM STRATEGY, STRUCTURE AND RIVALRY

1) **The management of information flow from primary suppliers to your company is:**

1= Inadequate; 4= Neutral; 7= Excellent

1	2	3	4	5	6	7

Comment:

---

2) **The flow and use of information from customers to your company to inform strategy is:**

1= Inadequate; 4= Neutral; 7= Excellent

1	2	3	4	5	6	7

Comment:

---

3) **The management of market intelligence for the avocado fruit industry is:**

1= Inadequate; 4= Neutral; 7= Excellent

1	2	3	4	5	6	7

Comment:

---

4) **Competition in the local market is:**

1= Very limited; 4= Neutral; 7= Very intense

1	2	3	4	5	6	7

Comment:

---

5) **Treats of new entrants locally (new avocado farmers) is:**

1= Less likely; 4= Neutral; 7= Highly likely

1	2	3	4	5	6	7

Comment:

---

6) **Competition in international market is:**

1= Very limited; 4= Neutral; 7= Very intense

1	2	3	4	5	6	7

Comment:

---

7) **Treats of new international competition is:**

1= Less likely; 4= Neutral; 7= Very likely

1	2	3	4	5	6	7

Comment:

---

8) **To what extent does economies of scale (i.e. extra savings in costs gained by increased production) influence your competitiveness?**

1= Minor influence; 4= Neutral; 7= Major influence

1	2	3	4	5	6	7

Comment:

---

9) **Your willingness to reinvest in avocado fruit operations:**

1= Reluctant; 4= Neutral; 7= Keen

1	2	3	4	5	6	7

Comment:

---

10) Your willingness to take risk:

1= Risk averse; 4= Neutral; 7=Risk taker

1	2	3	4	5	6	7

Comment:

---

11) Does your current resource base (in terms of land, human and capital) support future avocado fruit operations?

1= Insufficient; 4= Neutral; 7= Sufficient

1	2	3	4	5	6	7

Comment:

---

12) Competition for resources (land, information, human and capital) used by the industry vs other agricultural related activities:

1= Not competitive at all; 4= Neutral; 7= Very competitive

1	2	3	4	5	6	7

Comment:

GOVERNMENT SUPPORT AND POLICIES

1) South Africa's trade policies:

1= Constrains your company's competitiveness; 4= Neutral; 7= Enhances your company's competitiveness

1	2	3	4	5	6	7

Comment:

---

2) South Africa's land reform policy:

1= Constrains your company's competitiveness; 4= Neutral; 7= Enhances your company's competitiveness

1	2	3	4	5	6	7

Comment:

---

3) South Africa's labour policy (e.g minimum wage):

1= Constrains your company's competitiveness; 4= Neutral; 7= Enhances your company's competitiveness

1	2	3	4	5	6	7

Comment:

---

4) South Africa's macro-economic policies:

1= Constrains your company's competitiveness; 4= Neutral; 7= Enhances your company's competitiveness

1	2	3	4	5	6	7

Comment:

---

5) South Africa's competitions act:

1= Constrains your company's competitiveness; 4= Neutral; 7= Enhances your company's competitiveness

1	2	3	4	5	6	7

Comment:

---

6) South Africa's BEE (transformation) policy:

1= Constrains your company's competitiveness; 4= Neutral; 7= Is an opportunity to increase your firm's competitiveness

1	2	3	4	5	6	7

Comment:

---

7) The credibility and reliability of the current political system is (i.e constitutional action, elections, accountability):

1= Very low; 4= Neutral; 7= Very high

1	2	3	4	5	6	7

Comment:

---

8) The credibility and reliability of politicians are:

1= Very low; 4= Neutral; 7= Very high

1	2	3	4	5	6	7

Comment:

---

9) Regulation standards (e.g product standards, energy, safety and environment) in your opinion are:

1= Non-existent; 4= Neutral; 7= Among the world's most stringent

1	2	3	4	5	6	7

Comment:

---

10) Complying with regulatory standards:

1= Obstructs competitiveness; 4= Neutral; 7= Increase competitiveness by promoting improvement

1	2	3	4	5	6	7

Comment:

---

11) Administrative regulations are:

1= Burdensome; 4= Neutral; 7= Routine with minor effort

1	2	3	4	5	6	7

Comment:

---

12) The taxation system:

1= Impedes business investment; 4= Neutral; 7= Promote business investment

1	2	3	4	5	6	7

Comment:

---

13) Have legal or political factors over the past five years undermined your company's strategic positioning:

1= Have severely undermined strategic planning; 4= Neutral; 7= Have had no effect on strategic planning

1	2	3	4	5	6	7

Comment:

---

14) The effect of corruption and opportunism on business's competitiveness:

1= Impedes business investment; 4= Neutral; 7= Promote business investment

1	2	3	4	5	6	7

Comment:

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15) The water regulations act:

1= Hinges level of competitiveness; 4= Neutral; 7= Does not have an impact

1	2	3	4	5	6	7

Comment:

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16) The call for land expropriation without compensation will:

1= Constrains your company's competitiveness; 4= Neutral; 7= Enhances your company's competitiveness

1	2	3	4	5	6	7

Comment:

CHANCE FACTORS (Factors over which your firm has no control and are external in nature)

1) The current exchange rate:

1= Constrains your company's competitiveness; 4= Neutral; 7= Enhances your company's competitiveness

1	2	3	4	5	6	7

Comment:

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2) The exchange rate fluctuations:

1= Constrains your company's competitiveness; 4= Neutral; 7= Enhances your company's competitiveness

1	2	3	4	5	6	7

Comment:

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3) The ability of the avocado fruit industry to fully utilise the effect of unfavourable weather conditions on competitors:

1= Incapable; 4= Neutral; 7= Capable

1	2	3	4	5	6	7

Comment:

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4) Social unrest (such as polically motivated land grabs, labour strikes, xenophobia etc):

1= Imposes significant threat to your company; 4= Neutral; 7= Does not impose significant threat to your company

1	2	3	4	5	6	7

Comment:

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5) The South African political system in general:

1= Hinders competitiveness; 4= Neutral; 7= Promotes competitiveness

1	2	3	4	5	6	7

Comment:

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6) Crime in general:

1= Imposes significant threat; 4= Neutral; 7= Does not impose significant threat

1	2	3	4	5	6	7

Comment:

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7) Health (HIV/AIDS, TB etc):

1= Imposes significant costs to your company; 4= Neutral; 7= Does not impose significant costs to your company

1	2	3	4	5	6	7

Comment:

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8) Economic development and growth in South Africa:

1= Constrains your company's competitiveness; 4= Neutral; 7= Is an opportunity to increase your firm's competitiveness

1	2	3	4	5	6	7

Comment:

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9) To what extend do international/world events impact on your competitiveness (warfare/conflicts, international strikes etc):

1= Big impact; 4= Neutral; 7= No impact

1	2	3	4	5	6	7

Comment:

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10) Global recession will have:

1= Big negative impact on your company; 4= Neutral; 7= No impact on your company

1	2	3	4	5	6	7

Comment:

GENERAL QUESTIONS

1) What are the main factors influencing your decision making?
2) Do you think the current strength of the industry is sufficient to cope with the competition from both local and global competition? If not, what could be done?
3) What is preventing the South African avocado industry to be competitive like Southern hemisphere global rival Peru on a global scale?

4) Do you think the government is investing enough in the avocado industry in order to increase its competitiveness status?
5) If you could be selected to be in a committee that has to advise South African policy makers about making the avocado industry more competitive, what policy suggestions would you raise and why?
6) Who are the most threating competitors (both international and local)?

International	
Local	

7) What relationships to you have with other players in the industry (Producers, Processors, wholesalers, retailers and exporters)
8) If you have close relationships: do these relationships have an impact on the business? (better conditions, help, guarantee for sale, etc.), What impact do the relationships about the business? About the business of other actors?
9) How have these relationships developed?
10) What is done to take care of these relationships?
11) Do these relationships help you to be more competitive?

If you would like to be called to participate in follow up interviews, please provide your information below.

Name of Respondent:

Contact number:

Email address:

Geographical Area: (District/Municipality)

Thank you very much for taking your valuable time to complete this survey. Your response is highly appreciated