STUDY ON THE STATE AND OWNERSHIP PATTERNS OF THE FOOD AND BEVERAGES PROCESSING SUBSECTOR (AGRO-PROCESSING) IN THE FREE STATE AND THE LINKAGES WITH OTHER ECONOMIC SECTORS IN THE PROVINCE

January 2019

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Chapter 1: Introduction to agro-processing research project

1.1 Introduction and background

One of the key objectives of the Free State Growth and Development Strategy (FSGDS) is to ensure that the provincial economic growth rate increases by 7% in 2030 from the low of 5% in 2014. To achieve this objective the FSGDS puts forward, amongst others, that the contribution of the manufacturing sector to the provincial economy would have to increase from 14% in 2014 to 28% in 2030 with the contribution of non-petro-chemicals subsectors to the manufacturing sector increasing from 25% in 2014 to 50% in 2030. Accordingly, the manufacturing sector is one of the five priority sectors of the FSGDS (TOR Destea, 2018). An exploration of the Free State economy necessitates a detailed investigation of the South African economy.

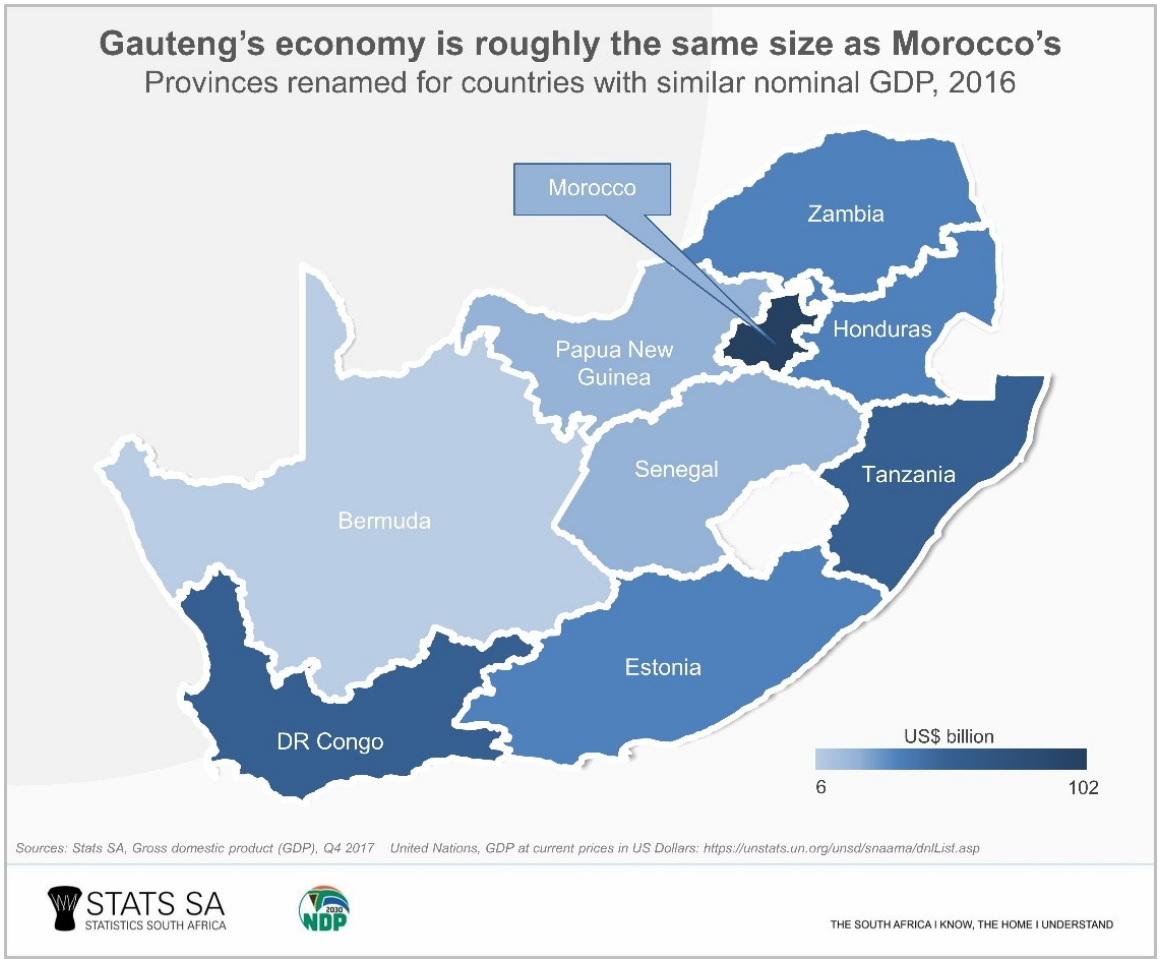


Figure 1.1: South Africa's economy expressed in GDP per province.

There are different ways to compare economic activity across nations, and many factors to keep in mind when doing so. Figures can differ according to the method used to produce estimates, and nominal GDP figures in US dollars (used here in Figure 1.1) can change significantly over time due to shifting exchange rates (STATS SA, 2017).

How do the provinces measure up in South Africa as a country? Figure 1.2 gives an indication of the GDP contribution of each province. To put this in perspective, in 2016 / 2017 the Gauteng economy was the seventh largest in Africa, surpassing heavyweights such as Kenya and Tanzania. KwaZulu-Natal was ranked in twelfth place, larger than the economies of Ghana and Tunisia (STATS SA, 2017).

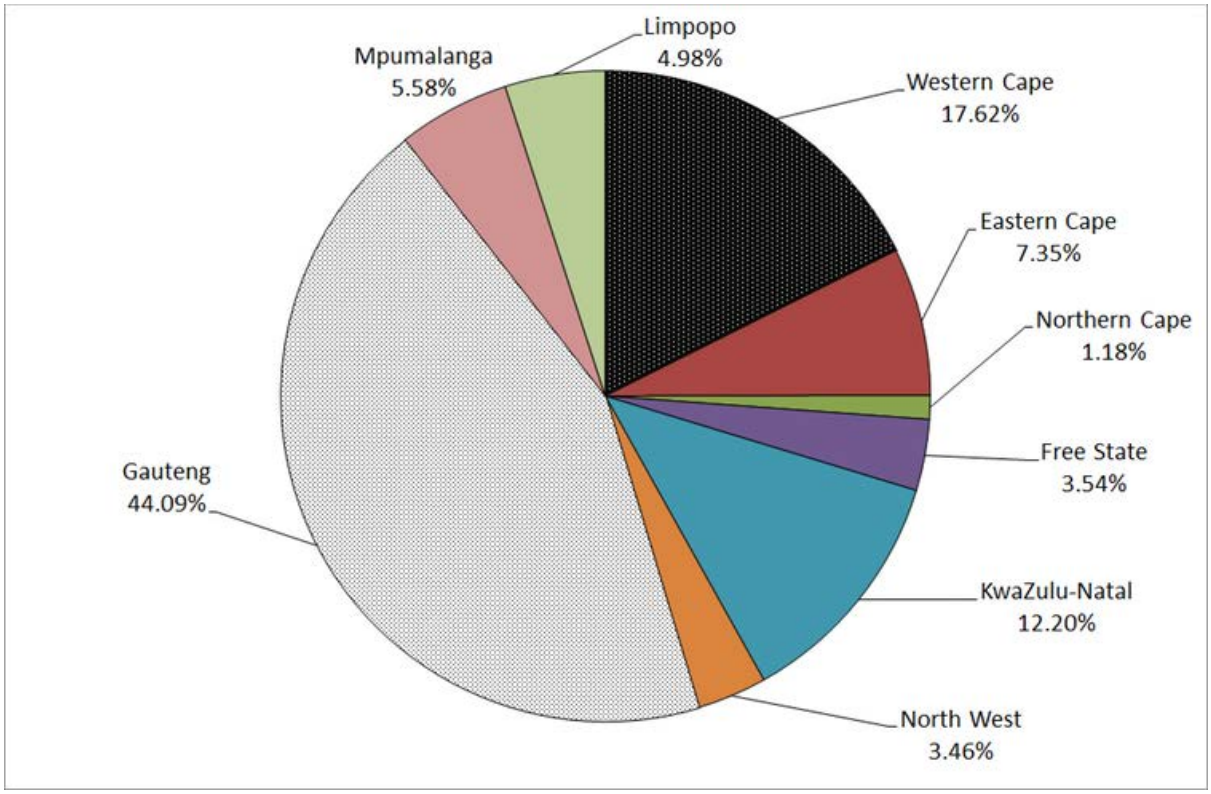


Figure 1.2: GDP contribution of provinces to the total GDP of South Africa

Source: STATS SA, 2018

Western Cape was in second place with a contribution of 40% of the Gauteng contribution. The contribution of the Free State is at 3.54%, only North West and the Northern Cape provinces have a lower contribution (STATS SA, 2018).

Using the per capita GDP as a measure across the African continent, the rankings shift significantly. Gauteng moves up to fourth place in terms of the highest GDP per

person, surpassing Gabon and Botswana, but lower than Mauritius and Seychelles. If the nine South African provinces were sovereign states, all nine would find themselves in the top 20 (STATS SA, 2017).

It is interesting to note that although Nigeria's economy (nominal GDP) is much larger than South Africa's, all South African provinces surpass Nigeria on a per capita basis (STATS SA, 2017). At this point one might be wondering how South Africa's GDP measures up to the economies of wealthier nations. Compared with the largest economy in world, the United States, the South African economy produced about the same level of economic activity as the state of Missouri, the 22nd richest state in the USA. The nominal GDP figures from the United Nations ranked South Africa as the 38th largest economy in 2016, smaller than Mexico, Poland and the Philippines; and larger than Egypt, Chile and New Zealand (STATS SA, 2017).

For a brief overview of the structure of the South African GDP per sector, see Figure 1.3. Interestingly, agriculture made the biggest contribution in the 4th quarter of 2017 (37,5%), followed by trade with 4.8 %. This high contribution figure for agriculture put again the emphasis on the importance of this sector for the South African economy (STATS SA, 2017).

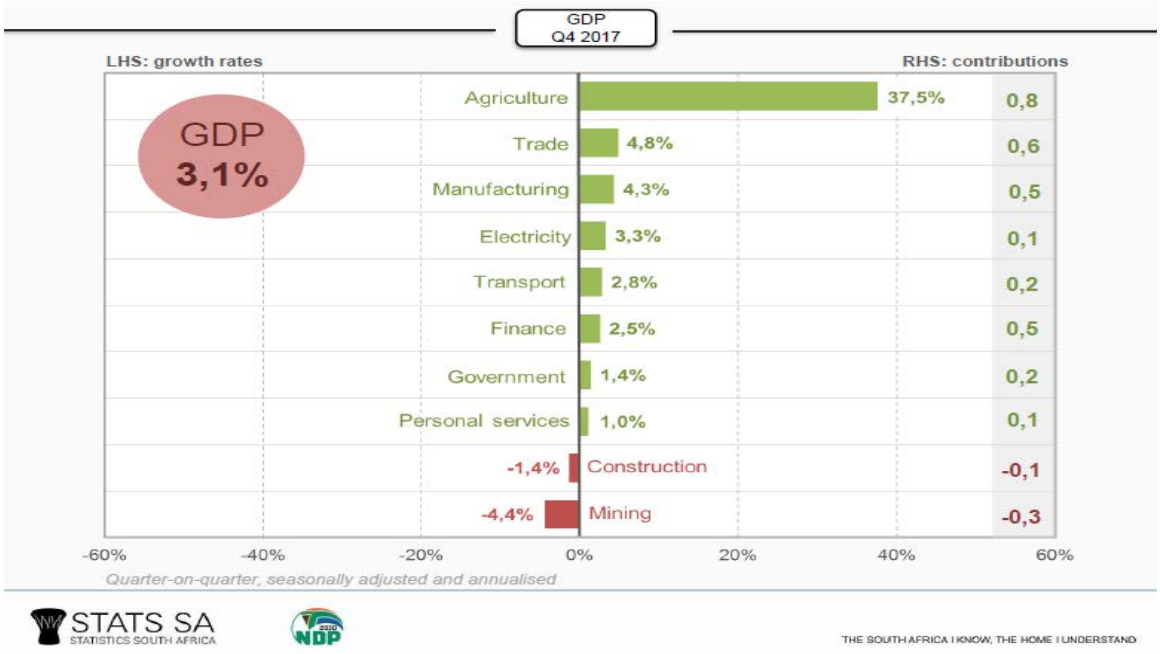


Figure 1.3: GDP contribution per sector in South Africa, 2017

The Free State, with 2,818 million residents, accounted for 5.17% of South Africa's population in 2017. The Free State's proportional contribution to the GDP of South Africa is 3.54% according to Figure 1.2. The next few figures give a better perspective on the Free State province. In 2017 – the latest available data – the real economy (represented by agriculture, mining, manufacturing and construction) made up 27% of the Free State's output. The largest real-economy sector was mining, at 11% of the provincial economy, followed by manufacturing at 9%, agriculture at 4%, and construction at 3%. The Free State contributed 10% of national agriculture and 7% of national mining, but just 4% of national manufacturing and 3,5% of national construction (STATS SA, 2017).

The above-mentioned statistics point the Free State Provincial Growth and Development Strategy towards identifying agro-processing as a potential growth sector with great opportunities for entrepreneurial development, employment and economic diversification. In response to this growth opportunity, the Free State SME Development initiative aims to contribute to the creation of employment through small and medium enterprise [SME] development in the Free State province by means of interventions in, amongst others, the agribusiness sector. With the new land reform process in mind, the agriculture sector is going to play a more important role in the Free State as well as in the South African economy. For that reason the agro-processing industry will play and needs to play an important role and this is emphasised by this research project.

Some of the main aspects that were investigated and that need to be addressed to better understand the holistic picture of the agro-processing industry are the following:

- The provision of an overview and a better understanding of the profile of the five different district municipalities in the Free State and their relevant agribusiness sectors;
- The exploration of entrepreneurial opportunities in the agro-processing sector;
- Possible SME development in the agro-processing industry and related industries;
- The identifying of gaps to create more employment opportunities; and
- Determining constraints within the agribusiness sector.

The focus of this study is to provide background information, trends, planning for value-chain development, value-adding opportunities as well as other opportunities in the agro-processing industry with specific reference to the Free State.

An overview of agro-processing in South Africa with specific reference to the Free State province and its agricultural sector provides the context for the project. The five district municipalities, which constitute the focus area of this study, will shed some light on the different options and the potential for different agro-processing value-adding products. Background information and demographics are playing a pivotal role, as well as detailed information regarding agricultural and economic activity in the respective municipalities.

Because of the fact that the latest available statistics on agribusiness and agro-processing are those of 2007, it was important to obtain recent primary agricultural and agro-processing data as the basis for decisions and recommendations. Although some secondary data is somewhat dated, primary data was available to provide the context of activities in these areas and to use the new researched data to compare the growth or decline in specific agro-processing activities. The main objective of this background is to provide the reader with an overview of agriculture, showing the main agricultural commodities, agribusiness as well as agro-processing in the Free State province.

It is also important to focus on the value chains, possible development opportunities and value-adding projects in the focus area. Information regarding projects and potential projects, which was identified as part of this study through fieldwork as well as interaction and work sessions with relevant role-players in the field, will be used as examples to add value to the agro-processing industry in the Free State. The value chains of the major commodities are discussed as far as possible per district municipality, but because there is so much overlapping of products it is not always possible to do it properly. Another reason is the fact that there are no specific boundaries for cooperatives like Senwes, OVK, etc. as they source products from all over the Free State.

Based on the context of the study and the capacity and capabilities of the municipalities, the potential development opportunities are discussed in more detail

in the latter part of the report. Overviews of relevant trends in agriculture and the agro-processing industry regarding the applicable commodities are briefly discussed to identify opportunities for value-chain development. The findings that can be concluded from this desktop and primary research study (Chapter 3), as well as recommendations for opportunities that should be discussed and investigated further in detail, are described in the Conclusions and Recommendations part (Chapter 4) of the report. The recommendations were to serve as guidelines and background information for discussions at the proposed Value-Chain Development Work Sessions and other forums to ensure sustainable entrepreneurial and small business development.

1.2 Problem statement

Creating economic development and more appropriate job opportunities in the Free State province requires a clear understanding of the extent to which the prioritised sectors as per the FSGDS and PEDS can be transformed and supported to reach this expectation.

A clear understanding of how the FSGDS and PEDS can contribute to economic growth and development in the prioritised sectors, with the concomitant creation of employment, is required.

Manufacturing plays a key role globally, nationally as well as locally in the Free State province. Manufacturing industries have assisted in driving economic growth and increasing households' living standards for nearly three centuries and continue to do so in developing economies (Brand Report, STATS SA, 2017).

The agro-processing industry, as a subsector of manufacturing, is a widely diverse subsector and is vital to the production of food and related products as well as the primary processing of wood into furniture and paper products. More specifically, food and beverage as a subsector of agro-processing could be a vehicle for potential job creation and an increased GDP contribution in the Free State as it is part of the whole value chain as depicted (Brand Report, STATS SA, 2017).

It is thus important to gain more specific knowledge about this industry to make sustainable strategic plans with regard to the opportunities but also constraints in this industry.

1.3 Primary and secondary objectives

1.3.1 Primary objective

The primary objective of the research project is to identify the state, ownership patterns, linkages and potential opportunities in the food and beverage processing subsector in the agro-processing industry in the Free State.

1.3.2 Secondary objectives

The secondary objectives in support of the primary objective are:

- To identify the nature, scope (volumes and value) and type of products that are currently being processed in the Free State;
- To database the details of all companies' owners, number of people employed, as well as their skills levels, in this sector;
- To identify challenges confronting the food and beverage processing sector in the Free State province regarding production;
- To analyse the challenges confronting the food and beverage processing sector in the Free State province regarding all possible marketing aspects;
- To analyse the supply and demand opportunities for the food and beverage processing sector in the Free State province regarding all possible marketing aspects;
- To identify all possible opportunities available where the necessary support activities can be strengthened to support the total value chain;
- To determine the economic developmental potential for local and export market potential for Free State agro-products;
- To determine the economic developmental potential for linking up with other sectors in the Free State province; and
- To make sustainable recommendations for the agro-processing industry in the Free State.

1.4 Project scope and overall deliverables

According to the terms of reference from the client, the following is the scope of the research project as well as the overall deliverables:

- All interim periodic progress reports were done, all deliverables are in the final report and for further discussions a workshop will be arranged to clarify some findings and timelines for further analysis and strategic planning.
- With the specific deliverables in mind, the following provides more detail of the specific deliverables for the project according to the project scope.
- This report reflects the current situation in relation to agro-processing with specific reference to the food and beverages subsector.
- This report contains the latest available food and beverage information in respect of:

Project scope	**Specific project deliverables**
Nature and type of products that are being processed	Database is developed with the following details: • Nature and types of products being processed in the Free State
Production volumes and value;	Database is developed with the following details: ➢ Production volumes of the main raw products produced by the agricultural industry in the Free State ➢ Manufacturing volumes set for the different production processes ➢ Manufactured volumes of the different products in the Free State ➢ The value of production in the Free State
Details of all companies participating in this sector, number of people	Database consists of the following

employed and the skills levels;	details: • All potential food processing manufacturers are listed in the database with the following details: • Company name, owner(s), race of owners, number, race and gender of people employed, skills levels according to a skills audit, needs around skills training.
Analysis of current market potential for Free State produced goods, both locally and abroad (end-users of food and beverage outputs)	• Market analysis details shown for the Free State, South Africa and internationally • A gaps analysis showing potential products to be produced in the Free State, in SA and for international markets • Link of the gaps analysis with production of raw materials produced in the Free State agriculture sector
Proposals on the opportunities available and support needed to strengthen linkages in the agro-processing subsector value chain	• Proposing solutions for the identified gaps provides some options to support the agro-processing sector and linking them to the right value chain for effective production processes
Economic developmental potential for Free State food and beverage	• Gaps analysis showing both the gaps in the food and beverage production options and the

products	manufacturing side of some of the main agro-products • The market potential indicates the production and manufacturing potential of some of the different products
Identifying probable and realistic export opportunities	• Gaps analysis and market potential show production possibilities for specific crops as well as marketing possibilities for export purposes to other provinces, Africa and the rest of the world
Challenges confronting the food and beverage processing sector in the Free State province	• Analysis of the challenges on the production side of raw materials from farmers is shown • Analysis of the manufacturing challenges from an agro-processing perspective is highlighted
Possible recommendations to address these challenges	• Analysis shows the possible production and manufacturing options of current and new products. • Recommendations for both increasing production of raw materials as well as manufacturing potential according to market analysis

Ownership in terms of race	• Already addressed as part of the database of the business details

1.6 Research methodology

The research was managed by the steering committee under the auspices of the DESTEA Economic Research Directorate. The researchers focused on researching and developing deliverables that respond to the specific objectives of this study. The researchers reported and interacted with the steering committee as planned in the accepted proposal on the following dates:

- 8 August 2018
- 5 September 2018
- Colloquium held on 12, 13 and 14 September 2018

The responsibilities of the steering committee were:

- To consider and approve all deliverables submitted by the successful service provider; and
- To ensure that money is spent according to budget.

The following is a summary of proposed activities and linkage with the Terms of Reference:

The proposed problem statement, objectives as well as deliverables comprise several clustered activities. Please note that some activities ran concurrently. All activities focused on the secondary objectives to reach the primary objective. Wherever applicable and feasible, the study both involved and referred to role-players and the impacts on the provincial and national / international opportunities and threats.

The key activities in the different phases of the project were the following:

Phase 1: Understanding and planning phase

1.1	Developed and agreed on methodology

1.2	Developed and agreed on project implementation plan
1.3	Inception meeting between CDS and Destea
1.4	Liaised with other consultants
1.4	Conducted a desktop study to determine what documents will be required and documented the available literature and other recent research findings around agro-processing in South Africa as well as the Free State. Identified gaps from the desktop study and verified them in the primary research part of the study.
1.5	Received ethical clearance from the Ethical Committee of the Faculty of Economic and Management Sciences to ensure that the work that the CDS completed is ethically correct and legitimate.
1.6	Agreed on a role-player engagement plan. All big agro-processing industries in and adjacent to the Free State, while most of the smaller agro-processing industries, identified by word-of-mouth, were part of the study. Some smaller agro-processing units on individual farms for own use were not included in the study because of the practicality to engage with them.

Phase 2: Project scope, methodology and analysis of the food and beverage subsector in agro-processing.

Although the above elements were all part of different stages of the total research and development plan, they were included in one phase.

2.1	Methodology of the research was as follows: Desktop analysis was done for the following: • Integrated development plans, social and labour plans, local economic development strategies and other local-level plans were scanned. Specific projects implemented to date also received attention. This includes any projects associated with SMME development linked to agro-processing.

	• Economic, food and living standard trends as well as household trends (Global Insight data) were scanned.
2.2	Primary research was done on the following: • Fieldwork operations • Structured interviews • Focus group interviews, and • Word-of-mouth follow-ups. A detailed analysis and gathering of as much information as possible of all agro-processing plants / products that are taking place in all towns / local and district municipalities in the Free State. This includes the following: • Nature and types of products processing • Production volumes, manufacturing volumes • Value of manufactured products • Company details which include ownership, race, age and other demographic aspects • Current and future market opportunities • Current and future market volumes • Gap analysis in the food and beverage industry
2.3	Finalised draft report (without the Mitigation Plan)

Phase 3: Mitigation and development potential

During the briefing, Destea specifically requested that much attention be devoted to a mitigation and development and growth potential plan. Although the integrated approach automatically contributes to suggestions regarding mitigation and development potential, a specific phase of the process gives priority to these aspects in detail. Below is a summary of some of the main actions that could be planned for

future purposes. These new actions can be planned in response to the findings and outcomes of the research activities, as per Chapters 3 and 4.

3.1	**Skills transfer** – there are different levels of skills transfer, and the following are some actions than can be implemented: • Subsequent to this study the transfer of skills to officials of the department to show them how to be part of the agro-processing activity planning with the University of the Free State (UFS).The reason is the following: After the conclusion of the research more knowledge is available with regard to the kinds of skills that have to be transferred. After the different levels have been identified in the report, a strategic planning session can be done to link the applicable institutions that are to provide the skills transfer and those who are in need of skills (employees, entrepreneurs and some small business owners) in the food and beverage agro-processing industry.
3.2	**Local economic development** – small business / farm development programme can be organised that comprises the following stages: business plan compilation, entrepreneurial/farm management training, mentorship and presentations for seed capital from applicable funders (including social entrepreneurship) and many more actions to be taken. Link up with the programme presenters (UFS Entrepreneurial and Farm Management Programme) and also the funding institutions to provide the seed capital required to develop and start the different viable businesses.
3.3	**Infrastructure development** – alternative use of available land, buildings, water supplies and other infrastructure owned by the community can be planned and discussed. Strategic plans and actions need to be put in place to utilise all applicable infrastructure in the best possible way to produce products according to the market needs.

3.4	**Regional development** – Incorporate the research findings with the IDP (Integrated Development Planning) of the Free State province. Subsequently, implement the identified sustainable projects with the help of the other institutions as role-players in the regional development situation to create additional job opportunities as well as contributing to the provincial as well as the national economy.

Phase 4: Project closure

During this phase, the final documents are delivered to Destea as well as a well-planned presentation to showcase the main findings and recommendations.

1.7 Conclusion

Agro-processing is and will be for many years to come the “buzz” word for economic growth and job creation, not only in the Free State, but also for the South African economy. The implementation of some new strategic agro-processing activities can put the Free State province on the forefront of provinces in South Africa because the Free State is known as the “food basket” of South Africa.

Chapter 2: Agro-processing in the South African context

2.1 Introduction

This research report and specifically this chapter provide a theoretical overview of agro-processing in South Africa with related trade trends, along with opportunities and challenges. It underscores the critical role of the agro-processing sector in promoting manufacturing-based value adding and job creation in South Africa in support of sustainable economic growth and development. Chapter 3 focuses more specifically on the Free State province.

The New Growth Path, together with National Development Plan, the Industrial Policy Action Plan (IPAP) and the South Africa Trade Policy and Strategic Framework acknowledge agro-processing as one of the vital sectors in accelerating the pace of industrialisation. Amid the fall in mineral commodity prices, the processing of agricultural products can help South Africa realise value-added growth and support labour-intensive sectors of the economy (GSA 2017).

To see the agro-processing industry in perspective, it is necessary to have a global look at the manufacturing industry in South Africa. The next paragraph gives a glimpse of the manufacturing industry.

2.2 The South African manufacturing industry in general

In South Africa, the manufacturing sector is characterised, generally, by low profitability, which is a consequence of a number of factors and which may well affect agro-processing (GSA 2017). The following are some of the drivers:

- An exchange rate which is volatile and generally over-valued;
- The high cost and limited allocation of capital to productive sectors, particularly the relatively more labour-intensive and value-adding sectors of the economy;
- Failure to adequately leverage domestic supply opportunities of the public capital expenditure programme;
- The monopolistic provision and pricing of key inputs into manufacturing and other productive processes and the concentrated purchasing power of outputs of these sectors;

- A weak skills system;
- Aged, unreliable and expensive rail and ports systems;
- Expensive land logistics;
- Rapid electricity price increases; and
- The high underlying real cost of capital in South Africa, relative to our main trading partners.

The manufacturing sector provides a locus for stimulating the growth of other activities, such as services, and achieving specific outcomes, such as employment creation and economic empowerment. This platform of manufacturing presents an opportunity to significantly accelerate the country's growth and development (https://www.brandsouthafrica.com/investments-immigration /business/economy/sectors/manufacturing-in-south-africa-#agriprocessing).

Manufacturing in South Africa is dominated by the following industries:

- Automotive
- Chemicals
- ICT and electronics
- Metals
- Textiles, clothing and footwear
- Agro-processing

The next part gives a short description of the different industries within the manufacturing sector which will show why the agro-processing industry is playing and can play a vital part in economic growth.

2.2.1 Automotive industry

The automotive industry is one of South Africa's most important sectors, with many of the major multinationals using South Africa to source components and assemble vehicles for both the local, African and other international markets. Despite its distance from some of the major markets in Africa, South Africa produces high quality products at prices competitive with other automotive manufacturing and assembly centres.

The South African automotive and components industry is growing rapidly and is perfectly placed for investment opportunities. Vehicle manufacturers such as BMW, Ford, Volkswagen, Daimler-Chrysler and Toyota have production plants in the country, while component manufacturers (Arvin Exhust, Bloxwitch, Corning, Senior Flexonics, 2017) have established production bases in the country.

The industry is largely located in three provinces, the Eastern Cape (coastal), Kwazulu-Natal and Gauteng (inland). Companies with production plants in South Africa are placed to take advantage of the low production costs, coupled with access to new markets as a result of trade agreements with the European Union and the Southern African Development Community free trade area. Opportunities also lie in the production of materials (automotive steel and components).

South Africa's aim is to become an automotive investment destination of choice. Modernisation and the upgrading of key elements in the automotive industry are required to keep pace with international competitiveness. Interest rates are currently at historic low levels, reducing the cost of investments. It is significant to note that most major multinational vehicle manufacturers are currently represented in SA, which means that international developments also impact on the country. The outlook for the vehicle industry is bright in terms of both exports and the domestic market. A key challenge will be to raise local content, particularly in the vehicles now being exported in large volumes. (https://www.brandsouthafrica.com/investments-immigration /business/economy/sectors/manufacturing-in-south-africa-#agriprocessing).

As can be seen from the above-mentioned automobile industry description, the Free State is not the most favourable provincial location for investments in this industry.

2.2.2 Chemical industry

The chemical industry has been shaped by the political and regulatory environment which created a philosophy of isolationism and protectionism during the apartheid years. This tended to foster an inward approach and a focus on import replacement in the local market. It also encouraged the building of small-scale plants with capacities geared to local demand, which tended to be uneconomic.

Through isolation of the industry from international competition and high raw material prices as a result of import tariffs, locally processed goods have generally been less than competitive in export markets. Now that South Africa is once more fully part of the global community, South African chemical companies are focusing on the need to be internationally competitive and the industry is reshaping itself accordingly.

Two noticeable traits characterise the South African chemical sector. Firstly, while its upstream sector is concentrated and well developed, the downstream sector – although diverse – remains underdeveloped. Secondly, the synthetic coal and natural-gas-based liquid fuels and petrochemicals industry is prominent, with South Africa being world leader in coal-based synthesis and gas-to-liquids (GTL) technologies.

South Africa's chemical industry is of substantial economic significance to the country, contributing around 5% to the gross domestic product (GDP) and approximately 25% of its manufacturing sales. The industry is the largest of its kind in Africa. It is highly complex and widely diversified, with end products often being composed of a number of chemicals which have been combined in some way to provide the required properties and characteristics.

The primary and secondary sectors are dominated by Sasol (through Sasol Chemical Industries and Sasol Polymers), AECI and Dow Sentrachem. These companies have recently diversified and expanded their interests in tertiary products, especially those with export potential. (https://www.brandsouthafrica.com/investments-immigration /business/economy/sectors/manufacturing-in-south-africa-#agriprocessing).

The manufacturing sector in the Free State is dominated by fuel, petroleum and chemicals which contributed the largest share of employment.

As can be seen from the mentioned details, there are no real opportunities for small entrepreneurial business development because of the sophistication and specialised skills needed in this sector. Another reason is that Sasol is the main player in the Free State and the current entrepreneurial linkage is covered in Sasol's

programmes. Furthermore, the contribution will not significantly increase by linking it up with any other entrepreneurial businesses, because Sasol is the main player and it is already contributing to the Free State economy.

2.2.3 ICT and electronics industries

The South African information technology (IT) industry growth outstrips the world average. The country's established and sophisticated indigenous information and communications technology (ICT) and electronics sector comprises more than 3 000 companies and was ranked 22nd in 2001 in terms of total worldwide IT spending. In 2018 South Africa ranked 46th on the global ICT index. Breaking it down, the Free State ranked 6th of the nine provinces in South Africa (https://www.itweb.co.za/content/o1Jr5MxEAX8qKdWL).

It has ready access to cutting edge technologies, equipment and skills and has the advantage of access to the rapid expansion of telecommunications and IT throughout the African continent. South African software developers are recognised as world leaders in innovation, production and cost efficiency backed by an excellent local infrastructure. This sector can be divided into three main subsectors: telecommunications, electronics and information technology.

The telecommunications industry is thriving, contributing more than 7% to South Africa's gross domestic product (GDP). With approximately 5,5 million installed fixed-line telephones, South Africa is ranked 23rd in telecommunications development in the world and represents more than 30% of the total lines installed in South Africa. Telkom, the sole fixed-line operator in South Africa, is a key player in a US$630 million optical fibre undersea cable project that will cater for Africa's growing telecommunications needs for the next 25 years. (https://www.itweb.co.za/content/o1Jr5MxEAX8qKdWL).

Growing at a rate of 50% per year and fourth fastest growing cell phone market in the world, the South African GSM cell phone market has three operators: Vodacom, MTN and Cell-C. Some of the world's leading telecommunication brands like Siemens, Alcatel, SBC Communications, Telecom Malaysia, Cell C and Vodaphone have made significant investments in the country.

The South African electronics industry has repeatedly proved itself in terms of world-class innovation and production. The industry is characterised by a handful of generalist companies with strong capabilities in professional electronics, while small to medium companies specialise in security systems and electricity pre-payment meters. Investment opportunities lie in the development of access control systems and security equipment, automotive electronic subsystems, systems and software development in the banking and financial services sector, silicon processing for fibre optics, integrated circuits and solar cells. There are also significant opportunities for the export of hardware and associated services as well as software and peripherals. (https://www.itweb.co.za/content/o1Jr5MxEAX8qKdWL).

As can be seen from the previous paragraphs, there are many opportunities in this industry. South Africa is ranked rather low on the list of progress, meaning that there are still many gaps to fill. Taken from the Free State's perspective, there are the same opportunities in the Free State as in other provinces with rural areas in terms of development, skills training, etc.

2.2.4 Metals industry

South Africa's large, well-developed metals industry, with vast natural resources and a supportive infrastructure, represents roughly a third of all South Africa's manufacturing. It comprises basic iron ore and steel, basic non-ferrous metals and metal products. The iron and steel basic industries involve the manufacture of primary iron and steel products from smelting to semi-finished stages.

Ranked the world's 19th largest steel producing country in 2001, South Africa is the largest steel producer in Africa (almost 60% of Africa's total production).

Primary steel products and semi-finished products include billets, blooms, and slabs, forgings, reinforcing bars, railway track materials, wire rod, seamless tubes and plates. South Africa is a net exporter, ranked 10th in the world, to more than 100 countries. Approximately 500 000 tons of ferrous-scrap were exported by metal recyclers in 2001. Imports accounted for only 5,8% of total domestic consumption of primary steel products in 2001. Sales to the local market increased by more than 6% during 2001 when compared with 2000. Iscor (now ArcelorMittal South Africa) is

South Africa's largest steel producer. Other industry players include Scaw Metals, Cape Gate, Columbus Stainless Steel, Highveld Steel and Vanadium and Cisco.

South Africa's non-ferrous metal industries comprise aluminium and other metals, including copper, brass, lead, zinc and tin. Aluminium is the largest sector but, as SA has no commercially exploitable deposits, feedstock is imported. South Africa is ranked eighth in world production of aluminium. Key players include Billiton (with smelters in Richards Bay) and Hulett Aluminium. Other non-ferrous metals are small in relation, but are still important for exports and foreign exchange earnings. Although the country's copper, brass and bronze industries have declined, it is hoped that new mining and reclamation technologies will allow exploitation of previously unviable deposits. (https://www.itweb.co.za/content/o1Jr5MxEAX8qKdWL).

The international and local steel industry has changed dramatically over the past two years. Several steel companies have fallen away and protectionism has increased. To survive in these harsh conditions, the South African primary steel industry has taken major steps to become more efficient and competitive. Many of the local steelworks have engaged in ongoing restructuring processes and productivity improvements. For example, Iscor's (ArcelorMittal) steel and mining divisions were unbundled towards the end of 2001 and Saldanha Steel was 100% integrated into Iscor's (ArcelorMittal) early in 2002.

The Free State has no iron-ore mines for the production of steel or factories to add value to iron-ore. It is thus not a preferred location due to export logistics.

2.2.5 Textiles, clothing and footwear industry

The South African textile and clothing industry has a powerful vision. The Chinese market have a huge influence on the local textile market. To change this impact, a few new innovative strategies needs to be identified. It now aims to use all the natural, human and technological resources at its disposal to make South Africa again the preferred domestic and international supplier of South African manufactured textiles and clothing. Though the textile and apparel industry is small, it is well placed to make this vision a reality.

Due to technological developments, local textile production has evolved into a capital-intensive industry, producing synthetic fibres in ever-increasing proportions. The apparel industry has also undergone significant technological change and has benefited from the country's sophisticated transport and communications infrastructure.

The South African market demand increasingly reflects the sophistication of First World markets and the local clothing and textile industry has grown accordingly to offer the full range of services from natural and synthetic fibre production to non-wovens, spinning, weaving, tufting, knitting, dyeing and finishing. Since 1994, about US$900 million has been spent on modernising and upgrading the industry, making it efficient, internationally competitive, and ready to become a major force in the world market.

Exports account for R1,4 billion for apparel and R2,5 billion for textiles, mostly to the US and European markets. Exports to the US increased by a dramatic 62% in 2001, driven primarily by the benefits offered under the Africa Growth and Opportunity Act (AGOA) which provides for duty-free imports of apparel produced in South Africa (https://www.itweb.co.za/content/o1Jr5MxEAX8qKdWL)..

The above-mentioned details around the specific manufacturing industries provide a glimpse into opportunities for the Free State in and around these industries. Up until now, with cheaper imports from China, the industry is still struggling. With some new import legislation from the government side, the industry can get back on its feet again. If the agro-processing industry is taken into consideration, a contribution can be made by this industry in the form of leather products like shoes, jackets, etc. Before exploring the agro-processing industry, other aspects have to be looked at in the manufacturing industry.

2.3 The South African manufacturing industry in particular

When the latest available statistics from SA Statistical Services are studied, the picture looks even bleaker for the manufacturing industry in South Africa. Figure 2.1

gives an idea of the contribution of all the main sectors to the South African Gross Domestic Product (GDP) and their growth or decline from 1980 to 2016. There are three sectors that show a decline in the GDP contribution during this mentioned period and they are manufacturing, mining and agriculture.

Manufacturing drops from a 22% contribution to the GDP to a mere 15%. Mining also declines from 21% to 6% and agriculture from 6% to only 2%. These three sectors can create most of the job opportunities in South Africa. The unemployment rate in South Africa has reached the highest level in years with just over 27% at the end of 2017. According to the figures from the Quarterly Employment Statistics (QES) survey, 2018, released by Statistics South Africa, the total number of jobs reported in the second quarter showed a decrease of 69 000, bringing the total number of persons employed in the formal non-agricultural sector of South Africa to 9 748 000 (http://www.statssa.gov.za/?s=manufacturing).

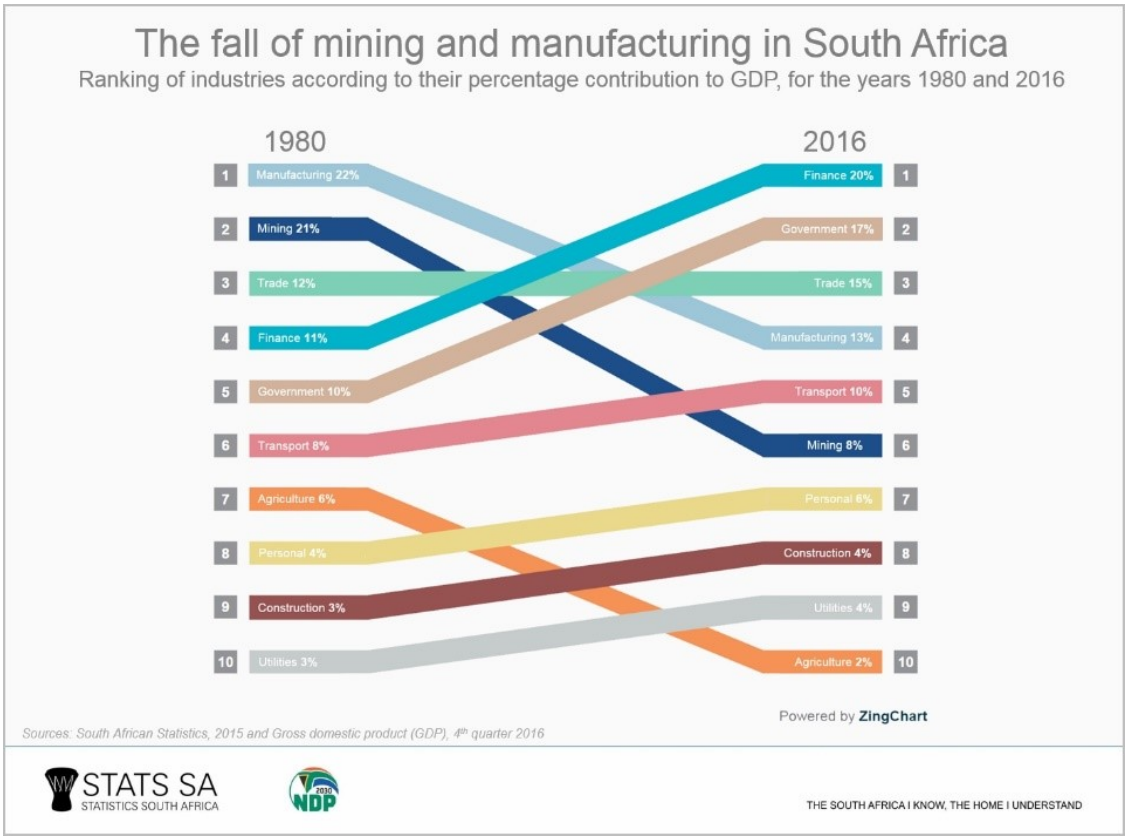


Figure 2.1: Contribution of the main sectors to the South African GDP, 1980 to 2016.

http://www.statssa.gov.za/?p=10718

Figure 2.2 also gives some detail around the fluctuation trends in manufacturing. It is important that some of the industries within the manufacturing sector need to be stabilised before there can be some linkages towards entrepreneurial and job opportunities. Although the GDP contribution of the agriculture industry is relatively low, the opportunities in this industry are manifold, which will be illustrated in a more detailed analysis, such as this research project.

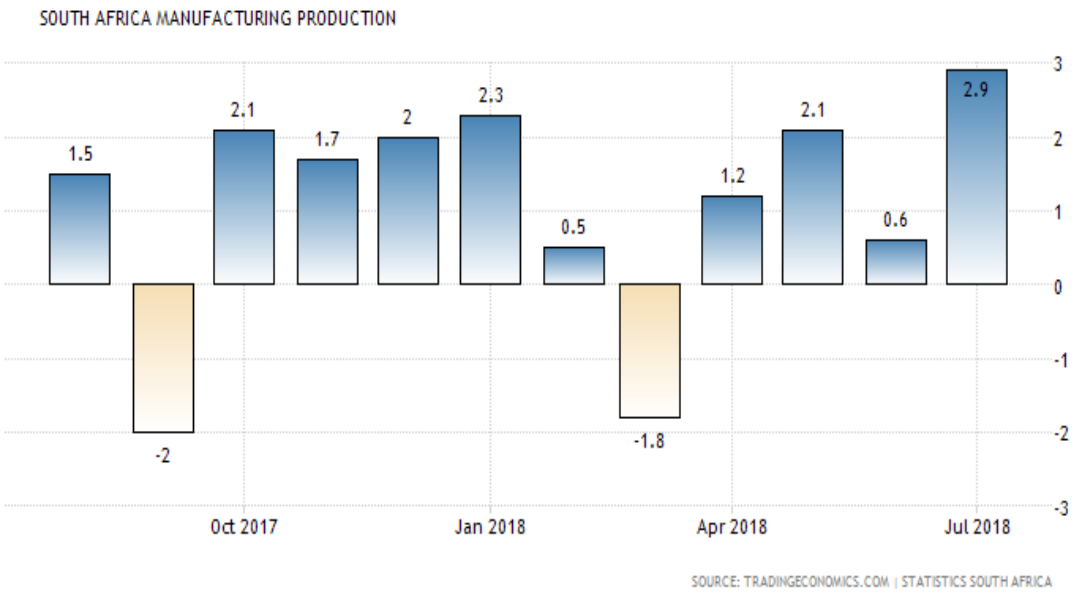


Figure 2.2: South Africa's manufacturing sector until July 2018
Source: Stats SA, 2017

Looking at agro-processing in general, the next part provides more insight into what is going on in the industry. Agriculture contributes roughly 4% to South Africa's gross domestic product (GDP) and consists largely of cattle and sheep farming, with only 13% of land used for growing crops. Maize is the most widely grown followed by wheat, oats, sugar cane and sunflowers. The government is working to develop small-scale farming in efforts to boost job creation and land reform. Citrus and deciduous fruits are exported, as are locally produced wines and flowers.

The South African agro-food complex has a number of competitive advantages, making it both an important trading partner and a viable investment destination. A world-class infrastructure, counter-seasonality to Europe, vast biodiversity and

marine resources, and competitive input costs make the country a major player on the world's markets. The establishment of preferential trade agreements, such as the Africa Growth and Opportunity Act (AGOA) for the US market and a free trade agreement with the European Union, confer generous benefits.

The above-mentioned was investigated for the agro-processing project for 2018 to indicate which aspects are still applicable, which ones are less important as well as what new aspects have come to the forefront 8 years later since 2010 (see more details in Chapter 3).

When investigating the agriculture sector for manufacturing purposes in South Africa as well as for the different provinces as such, the conclusion is that there are many gaps for manufacturing opportunities.

The Free State can be seen as the "food basket" of South Africa producing wheat, maize and other staple food products in thousands of tons. Information on the agro-processing sector in South Africa, and in the Free State, is not readily available. Some research reports are available but they are already outdated because the data has not been updated since 2012. With regard to the manufacturing sector in South Africa, the "food and beverage" component is an important indicator of growth and development in the sector. (It should be noted, however, that agro-processing refers to the processing of food and fibre, and therefore the "food and beverage" indicator is only partially successful).

The second largest percentage of employment in manufacturing was contributed by food and beverages, following by fuel, petroleum and chemicals (Marais 2011). The question is: "Do fuel, petroleum and chemicals still make the largest contribution to employment, and what is the current situation in the food and beverage environment, what gaps are there not only in the Free State but also in South Africa and what opportunities make the most sense to ensure that job opportunities and growth take place in this sector?"

The questions are the basis for important research into the agro-processing industry in more detail in 2018 to examine the changes and the new trends and opportunities

in the industry. Chapter 3 gives a more detailed perspective of the findings currently explored in the agro-processing industry in the Free State.

2.4 The South African agro-processing industry in general

Agro-processing, a subsector of the manufacturing industry, is the process that makes use of raw materials and intermediate products derived from the agricultural sector. Agro-processing thus means transforming products that originate from agriculture, forestry and fisheries. The agro-processing industry is among the sectors identified by the Industrial Policy Action Plan (IPAP), the New Growth Path (NGP) and the National Development Plan (NDP) for its potential to spur growth and create jobs because of its strong backward linkage with the primary agricultural sector. The Standard Industrial Classification (SIC) also categorises the following eleven divisions under the agro-processing industry, namely: food, beverages, paper and paper products, wood and wood products, textiles, wearing apparel, furniture, tobacco, rubber products, footwear and leather and leather products.

A key characteristic of the agro-processing sector is its strong upstream and downstream linkages. Upstream, the sector links to primary agriculture across a wide variety of farming models and products. Downstream, agro-processing outputs are both intermediate products (to which further value is added) and final goods that are marketed through wholesale and retail chains. The “organic‟ link with primary agriculture makes agro-processing critical for employment creation and poverty eradication. Moreover, the agriculture and agro-processing value chain is defined by a sizeable labour/capital ratio L/C of 1:5.54, which makes it an important source of labour-intensive growth (*Quantec South Africa, 2018).*

Agro-processing is a widely diverse subsector and is vital to the production of food products as well as the processing of wood for furniture and paper products. The food and beverage division as a subsector of agro-processing could be a vehicle for potential job creation as it is part of the whole value chain. Especially in the Free State, where many agricultural products are produced, agro-processing can play a bigger role in contributing to the Free State economy as well as to the overall GDP of South Africa.

2.5 The South African Agro-processing industry in particular: Some notable facts

The agro-processing sector contributes a significant component of total manufacturing value added as well as employment. The average contribution of agro-processing to the output and value added of the manufacturing sector was 18.2 per cent and 19.8 per cent, respectively, during 2012-2017. Its contribution to domestic fixed investment was 15.1 per cent and to employment 18.0 per cent during the same period. See table 2.1.

Table 2.1: Sector economic data in 2010 prices

Variables	Contribution 2012 to 2017
Agro-processing (% of output in manufacturing)	18.2
Agro-processing (% of value added in manufacturing)	19.8
Agro-processing (% of investment in manufacturing)	15.1
Agro-processing (% of employment in manufacturing)	18.0

Source: Quantec South Africa, 2018

Figure 2.3 shows the top ten export products for South Africa. As can be seen there are not many agro products as part of the top ten list. This top ten list makes up 74.2% of the total percentage of all exports. Fruits and nuts make up 3.8% while beverages, spirits and vinegar make up only 1.5%. A more detailed investigation into the export of agro-processing products is shown in Figure 2.4.

From 2013 to 2017 there is no increase in export of the top ten agro-processing products. In actual fact the export declined from a mere 51.4% to 49.5%. Wine and fresh grapes, amounting to a fifth of the top ten products, declined somewhat. Most of the other products did not change over the 5-year term.

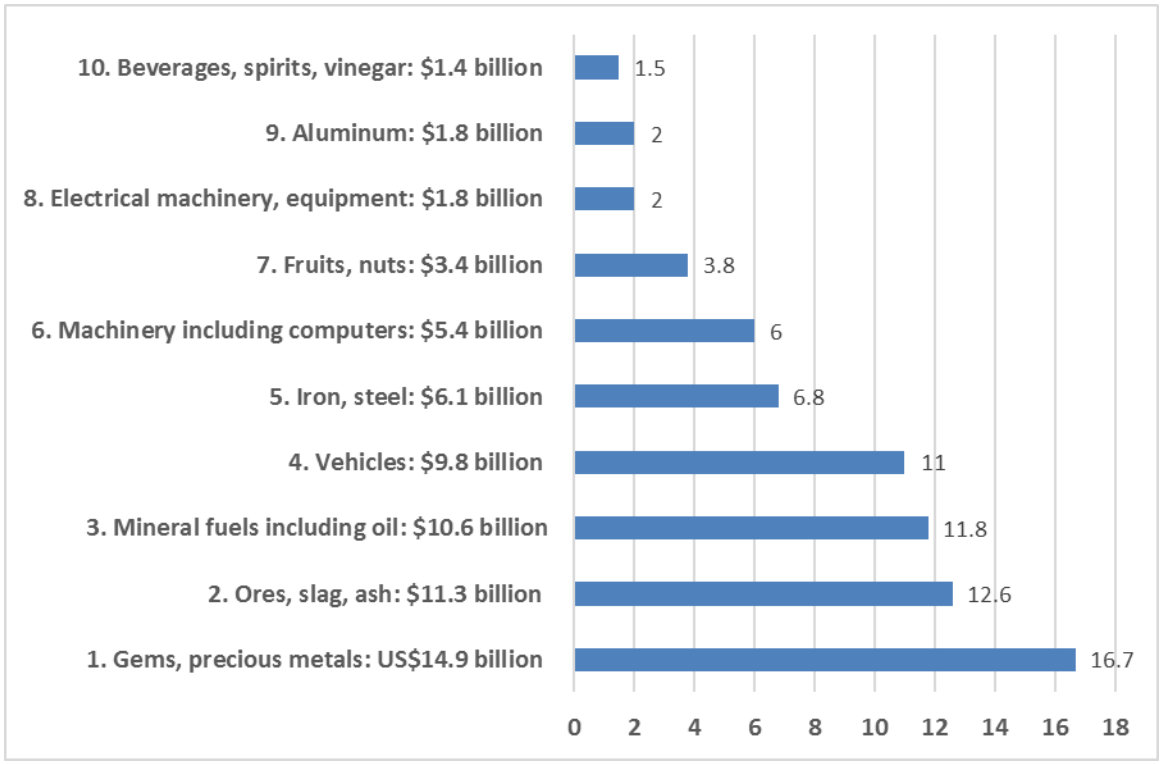


Figure 2.3: Top ten export products for 2017.

Source: Author's own creation, 2018

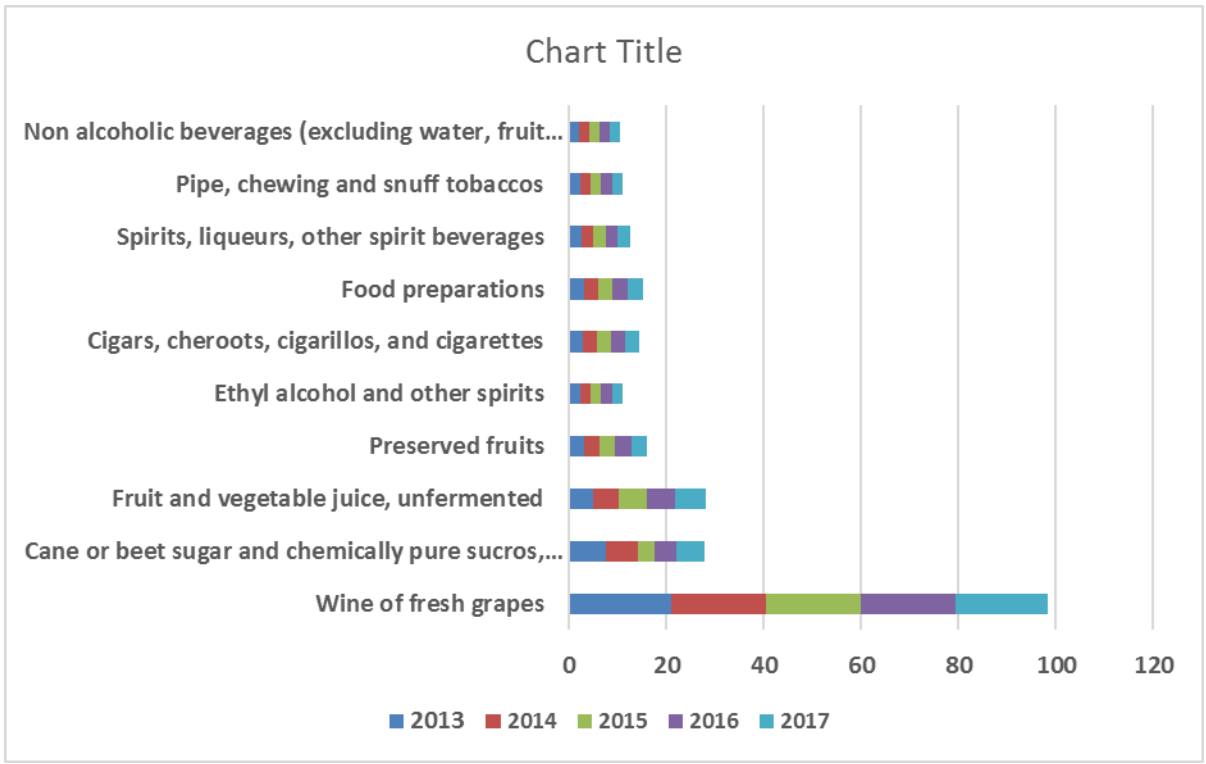


Figure 2.4: South Africa's top exports in agro-processing products, 2013 to 2017

Source: Author's own creation, 2018

The main categories of South African agro-processing exports are presented in Figure 2.4. The top 10 products accounted for 83% of all exports in the sector in 2005-2007, decreasing to 61% in both 2010-2012 and further decreased to just under 50% from 2013-2017.

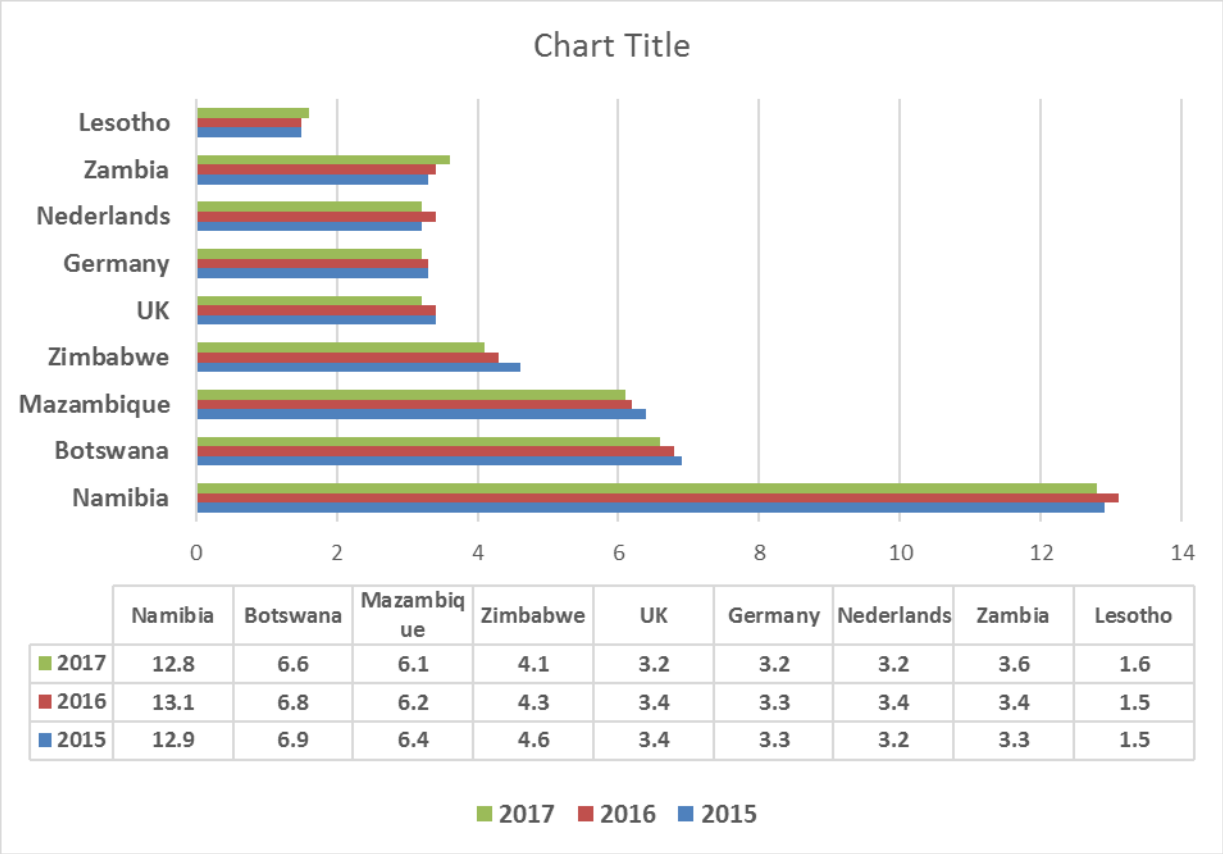
Wine or / and fresh grapes, cane or beet sugar, *fruit and vegetable juices*, and *preserved fruits* are the leading exports in 2017 (Figure 2.4). Between 2005 and 2017, the share of *fruits and vegetable juices* gained an additional 1.1 per cent. In terms of export growth, South Africa recorded the highest growth in 2010 when the global market was on the verge of recovery from the economic crisis. However, the country failed to capture a greater portion in what seems to be the highest world demand in agro-processing (since 2005) witnessed in 2011. Nonetheless, the continuous decline in the country's exports since 2012 could be attributed to weak global demand for processed agricultural products.

Post forecasts that sugar production in South Africa will increase by 7 per cent to 2.2 million MT in the 2018/19 MY, based on the improvement in sugar cane quality, better factory recoveries and an increase in sugar cane delivered to the mills for crushing. Post forecasts that sugar exports will increase significantly by 20 per cent to 900,000 MT in the 2018/19 MY, due to an increase in sugar production, and large available stocks (Sikuka, 2018).

When exploiting the list of the top ten agro-processing products, it shows that not many of these products can and are currently produced in the Free State. Products that can be produced in the Free State are the following:

- Sugar beet
- Fruit and vegetable juice from specific fruits and vegetables
- Preserved fruits/dried fruits
- Wine and fresh grapes

More details can be seen in Chapter 3 around the pros and cons of producing the mentioned products.



	Namibia	Botswana	Mazambique	Zimbabwe	UK	Germany	Nederlands	Zambia	Lesotho
2017	12.8	6.6	6.1	4.1	3.2	3.2	3.2	3.6	1.6
2016	13.1	6.8	6.2	4.3	3.4	3.3	3.4	3.4	1.5
2015	12.9	6.9	6.4	4.6	3.4	3.3	3.2	3.3	1.5

Figure 2.5: Top destinations of agro-processing products

Source: Author's own creation

These are currently the top destinations for the different agro-processing products (Figure 2.5). Lesotho and Zambia areas the only two countries to which the export has grown from 2016. As mentioned in a previous paragraph, South Africa's exports in agro-processed products declined after 2010, but it seems that not much has been done to ensure more or new markets or to increase the sales in the current markets. Table 2.2 gives the average annual growth rate of agro-processed products. It becomes clear that some of the more important exporting products have declined over the past few years.

Table 2.2: South Africa's revealed comparative advantage expressed in annual agro-processed products, 2018

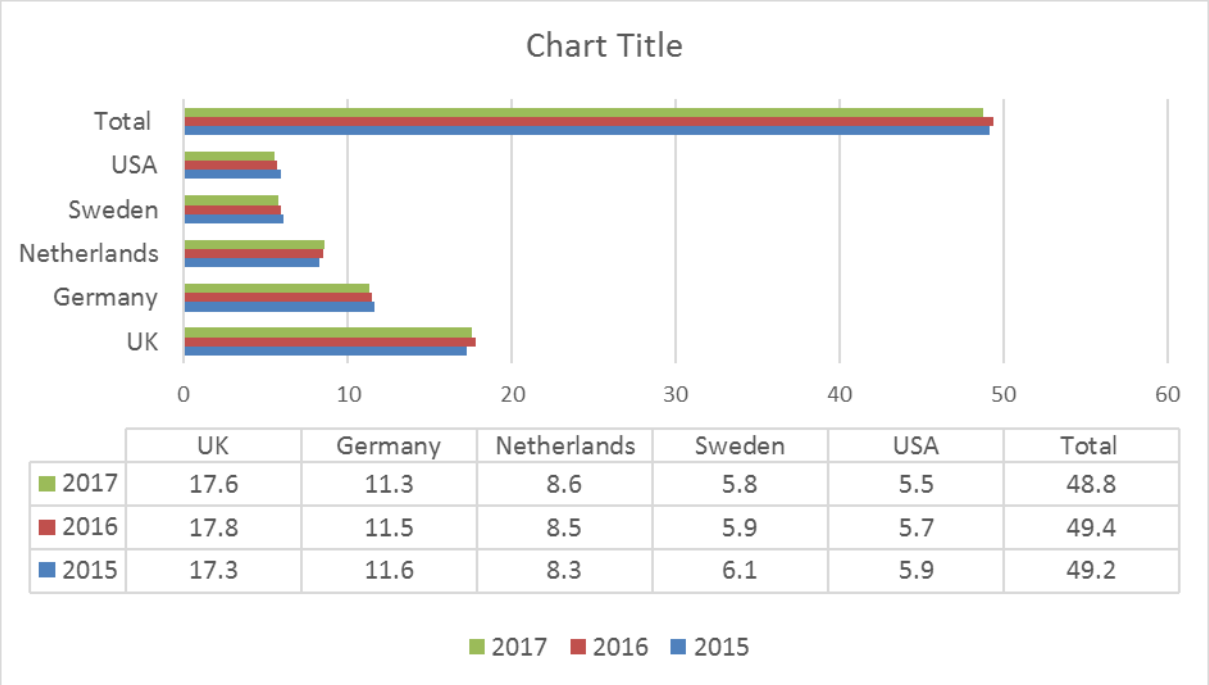
Revealed comparative advantage	Average growth rate 2012 to 2017
Ethyl alcohol & other spirits	-12.2
Cane or beet sugar and chemically pure sucrose, in solid form	-10.8
Preserved fruits	-7.9

Pipe, chewing & snuff tobaccos	-5.9
Wine or / and fresh grapes	-3.8
Yeast	-1.8
Fruit & vegetable juices, unfermented	2.8
Cigars, cheroots, cigarillos & cigarettes	4.4
Ground-nut oil & its fractions	4.9
Safflower, sunflower/cotton-seed oil & fractions	5.6
Cucumbers, gherkins and onions preserved	5.8
Spirits, liqueurs, other spirit beverages, alcoholic preparations	5.8
Flour etc. of meat, meat offal, fish, crust etc. unfit for human consumption	6.6
Non-alcoholic beverages (excl. water, fruit or vegetable juices	6.7
Jams, fruit jellies & marmalades	6.8
Food preparations	7.8
Ice cream	10.7
Lard stearin & oil, oleo stearin & oil & tallow oil	10.8
Margarine	10.9
Sauces mixed condiments & mixed seasonings	11.7
Soups, broths & preparations thereof	11.8
Sugar confectionery (incl. white choc), not containing cocoa	12.4
Prepared or preserved vegetables (excl. frozen)	12.8
Fish/marine mammal, fat, oils & their fractions	16.5
Animal feed preparations	18.2
Breakfast cereals & cereal bars	20.9
Fermented beverages	24.6
Vermouth & other grape wine	29.6
Soya-bean oil & its fractions	54.3

Table 2.2 gives an indication of the growth or decline rates of different agro-processing products over the past 5 years. More additions to this table as well as export opportunities are part of the next chapter (Chapter 3). Looking at the export countries as well as the products in this table, there are many opportunities, and with proper production on the input side as well as more and effective marketing strategies to each country as a focused target market South Africa can do well and the growth rate of many of the mentioned products can increase.

Take wine and fresh fruit as an example. The details for the wine and fresh grapes are indicated in Figure 2.6. Wine and fresh fruit exports only increased from 2015 to 2017 in the UK and the Netherlands. The overall total of wine and fresh fruit declined until 2017. The question is why? A detailed analysis shows that on the production side the drought in the Western Cape had a huge influence on fruit and wine

production in the past three years. “Western Cape fruit and wine farmers and rural communities are under tremendous socio-economic pressure due to the crippling drought, according to the deciduous fruit industry organisation, Hortgro. The figures do not tell the full story. We are in the midst of a drought cycle, so when the full potential of the industry is taken into account, harvest estimates are in some cases down by 25%” (https://www.agriorbit.com/drought-challenges-fruit-industry/).



	UK	Germany	Netherlands	Sweden	USA	Total
2017	17.6	11.3	8.6	5.8	5.5	48.8
2016	17.8	11.5	8.5	5.9	5.7	49.4
2015	17.3	11.6	8.3	6.1	5.9	49.2

Figure 2.6: Wine and fresh fruit exports, 2015 to 2017

With a view to the Free State, not many of these agro-processed products are produced in the Free State. **Grains** and cereals are South Africa's most important crops, occupying around 55 per cent of hectare under cultivation in the 2017s. **Maize**, the country's most important crop, is a dietary staple, a source of **livestock feed**, and an export crop.

According to Table 2.3, the Free State province is the most important province in South Africa for producing white and yellow maize.. Maize production in tonnage is highly dependable on summer rain, especially in the Free State province. This is the reason, as indicated in Table 2.3, that the 2016/17 year’s yield was the highest tonnage ever produced, with 2013/14 the second highest. Despite this seasonal dependence on rain, the Free State still produced the highest tonnage of all provinces from 1986 to 2018. But, as can be seen, there is a small decline in the

maize production areas in the Free State. The past 6 years on average just over 720 000 hectares of white and 500 000 of yellow maize were planted, except for the 2015/16 year when the drought was at its worst. In the 2017/18 year there was a decline of around 20% in white maize hectares planted but a slight increase in yellow maize plantings. The reason for the lower white maize hectares planted was the fact that there was still enough white maize from the previous year (2017).

A new trend in the Free State over the last 5 years is that the number of hectares planted under soya beans is on the increase and in the 2017/18 season the Free State was the second biggest producer of soya beans in South Africa with a tonnage of 517 500 behind the 604 000 tons of Mpumalanga.

Of all the maize produced in the Free State, less than 50% is used in the Free State in order to add value. This is just an example of the importance of further investigating the agro-processing industry in the Free State in more detail to get a holistic picture, not only for maize, but also for all other products already produced and also to be produced in the Free State (See Chapter 3 for more specific details).

There are 5 district municipalities in the Free State (see Figure 2.7). Each one of the municipalities is different and also different in terms of what and how many products they produce. In terms of a regional focus, the Fezile Dabi District Municipality and the Mangaung Metro are responsible for 69 per cent of manufacturing employment. In Fezile Dabi, this is due to the preponderance of the petrochemical industry. The one area that has been hit hardest in respect of manufacturing is the Matjhabeng Municipality, where the area lost nearly 50 per cent of its manufacturing jobs between 1996 and 2017 (Adapted from Marais 2011, 2018).

Table 2.3: Maize (white and yellow) production per province in South Africa, 2013 to 2018

RSA white maize production	2013/14	2014/15	2015/16	2016/17	2017/18*	% change
Areas	'000 t	'000 t	'000 t	'000 t	'000 t	
Wes-Kaap/W. Cape	4.50	4.05	5.00	2.00	0.00	-100.0
Noord-Kaap/N. Cape	25.30	35.00	35.00	46.20	41.76	-9.6

Vrystaat/Free State	3759.50	2236.50	1190.50	5111.75	3445.40	-32.6
Oos-Kaap/E. Cape	13.75	15.60	10.00	30.80	21.70	-29.5
Kwazulu-Natal	266.60	224.00	215.00	350.00	292.50	-16.4
Mpumalanga	907.20	824.00	752.00	1088.00	840.00	-22.8
Limpopo	183.00	156.75	178.00	300.00	86.40	-71.2
Gauteng	357.15	193.60	207.00	390.00	290.00	-25.6
Noordwes/North West	2193.00	1046.00	816.00	2574.00	1683.50	-34.6
TOTAL	**7710.00**	**4735.50**	**3408.50**	**9892.75**	**6701.26**	190.2
	2nd			Record		

RSA yellow maize production	2013/14	2014/15	2015/16	2016/17	2017/18*	% change
Areas	'000 t	'000 t	'000 t	'000 t	'000 t	
Wes-Kaap/W. Cape	28.5	34.2	40.0	20.0	33.8	68.8
Noord-Kaap/N. Cape	638.4	644.0	675.0	657.0	636.4	-3.1
Vrystaat/Free State	2487.8	1708.5	1023.0	2218.8	2070.5	-6.7
Oos-Kaap/E. Cape	97.6	84.0	66.0	66.5	71.5	7.5
Kwazulu-Natal	292.5	283.5	307.0	385.0	390.0	1.3
Mpumalanga	1875.0	1605.3	1567.0	2343.0	2040.0	-12.9
Limpopo	124.0	124.0	132.0	192.0	147.0	-23.4
Gauteng	291.3	292.5	235.0	408.0	378.2	-7.3
Noordwes/North West	705.0	444.0	325.0	561.0	440.0	-21.6

Figure 2.7: The different district municipalities in the Free State Province

Although the trend has been a reduction in the number of larger enterprises, the increase in the number of new smaller enterprises did not help to replace all the jobs

that had been lost. “This raises the serious issue regarding whether the focus should be on attracting larger enterprises or on creating new smaller enterprises” (Centre for Development Support (CDS) 2014). At the same time, the linkages between smaller and larger firms are important.

In a research study on the Free State manufacturing sector, the advantages and disadvantages of being located in the Free State were considered by manufacturing entrepreneurs. On the positive side, the five main favourable responses were:

- Access to a stable working force;
- Central location;
- Proximity to the raw product;
- The availability of incentives (mostly in Botshabelo and Maluti-a-Phofung); and
- Generally low costs of accessing premises (Adapted from CDS 2014, 2018).

The negative responses pinpointed distance to markets/suppliers and harbours (particularly where markets have been centralised in the larger cities), labour problems and transport-related problems: “Enterprises located in these locations have to balance the cost of their premises with increased transport costs to the markets.” The maintenance of infrastructure by local governments will be a non-negotiable prerequisite for the retention of manufacturing businesses in the Free State. Other preconditions for industry development are the revitalisation of the TVET skills training system, assistance with market intelligence, provision of one-stop business support and ensuring that companies are aware of support systems (Adapted from CDS 2014, 2018).

The following had already been identified during the 2010s as candidates for foreign direct investment (FDI) (although agro-processing and beneficiation is generally dealt with under “manufacturing”):

- Leather tanning and finishing: The Free State boasts extensive livestock farming. This industry exports wet salted hides to other provinces and overseas as raw materials. This opens the door of opportunity to establish more tanneries for processing hides into finished leather products for domestic and foreign markets.

- The floriculture industry in the Free State has a high-value export potential and is therefore considered viable. The cut-flower producers in the province are few in number and small in size, but they collectively export more than 1.2 million cut flowers per annum.
- The province is working to establish the Eastern Free State as South Africa's agri-processing hub. This is being done by exposing commercial and emerging farmers to opportunities for value-adding to traditional agriculture products, e.g. fruit juices, canned fruit and vegetables, and new crops such as herbs and essential oils.

In terms of these inputs into the PGDS, it therefore appears that the scope for agro-processing is very limited, especially in the Free State. Furthermore, the Free State Department of Agriculture has a minimal focus on agro-processing, as can be seen from the above-mentioned opportunities, and nothing has been done about it since 2010. In its 2011/12 Budget Vote, there is a cryptic mention of “Agro-business development and support: The functions are to identify and disseminate information on marketing opportunities for value adding and to provide farm economic support to other programmes and clients (financial feasibility and economic viability studies)” (Free State Department of Agriculture, 2011, p.17). Up until 2017 this focus and the perception of agro-processing did not change in the Free State Legislator.

One agro-processing initiative was mentioned in the 2011 Budget Vote of DETEA: “The Harrismith Food Processing Park in Thabo Mofutsanyane district at an advanced stage. The food processing hub is intended to host investments worth R600m from multinational companies in the food production sector. This project should provide about 200 short-term jobs during construction and about 1,000 permanent jobs on completion” (Dukwana 2011, p. 7). An investigation into the establishment of the Food Processing Park in Harrismith showed that it is still not fully operational. A detailed research investigation will also be launched around this hub, because it promises to be a very good opportunity and able to fill a gap when in operation.

Here is the latest development according to the website:

Maluti-A-Phofung Special Economic Zone (M-SEZ)

A Special Economic Zone (SEZ) is defined as a geographically designated area of a country set aside for specifically targeted economic activities, which are then supported through special arrangements (which may include laws) and support systems to promote industrial development. The SEZ programme is a tool that is used by many countries to promote trade, economic growth and industrialisation. The M-SEZ is one of the eleven SEZs which the South African government intends to license.

M-SEZ is only one of the two projects that is about to receive an interim licence as an Industrial Development Zone (IDZ) to expedite the establishment process that is already gaining critical mass. This licence will be converted into a SEZ licence as soon as that legislation is enacted. The Free State Development Corporation (FDC) has applied for funding for the SEZ infrastructure development.

The Tshiame Food Processing Park

The Free State Development Corporation (FDC) is seeking investors and partners to locate into the Food Processing Park in Tshiame, Harrismith, in the Eastern Free State as part of the M-SEZ. Up to 60 000m2 of space is available for development. Opportunities for investment exist in the production of potato crisps, potato flakes, maize grit, cereals and frozen vegetables.

This project is intended to position Harrismith as an agro-industry hub by creating value-adding capacity and ensure that agri-commodities produced in the Free State are processed locally and exported. The hub will host multinational and domestic companies in the food production sector and will provide for logistical services, warehousing, cold storage and manufacturing facilities to enhance production efficiencies.

The value of this project is estimated at R1.5 billion and is expected to be implemented in phases over a three- year period. The land for this project has already been secured and the feasibility study and business plan have been completed.

The government's new Industrial Policy Action Plan (IPAP2) places a great deal of emphasis on the agro-processing sector (GSA 2010, p. 46). The sector comprises a highly diverse group of subsectors and industries: food processing, beverages, aquaculture, horticulture and the production of medicinal products, aromatics and flavourants.

But currently the aforementioned aspects are not relevant any longer. The industrial hub in Harrismith is not a priority for the area anymore. Looking at Chapter 3, there

are now other and newer value-adding options on the cards which are and can be essential for growth and development in the Free State province.

2.4 Conclusion

Although the Free State is the “food basket” of South Africa, many of the field crop products are transported out of the Free State and value adding takes place in other provinces. According to the desktop research, there are not too many options for agro-processing in the Free State, but during primary research conducted in the province, there are more opportunities than previously thought.

A major problem that needs to be addressed is the fact that the role of the provincial and local governments needs to be enhanced to ensure that more agro-processing can take place in the Free State.

Chapter 3: Deliverables of the research study

3.1 Introduction

Agriculture and other natural resource-based enterprises are the foundation for economic growth in many developing countries. Of the 11 per cent of the world's land surface that is suitable for agriculture, 38 per cent has become degraded by poor natural resource management practices.

South Africa's population is currently (September 2018) 57,398,421, growing at around 1.2% per year (http://worldpopulationreview.com/countries/south-africa-population/, 26 September 2018). Food production or imports must more than double to feed the expanding population, and production needs to increase using the same or fewer natural resources. (See Table 3.1) With no significant room to expand areas of cultivation, good stewardship of the available land and produced products is necessary to maintain agricultural productivity, ensure economic growth, protect biodiversity, maintain sufficient amounts of clean water and meet the increasing food demands of a growing global population. Furthermore, smaller farmers in South Africa cannot compete successfully with subsidised produce from overseas that is dumped in South Africa at below production cost. Therefore new and more creative developments have to be initiated and more value-adding products need to be produced in the same area than at present.

South Africa has limited fertile land and the majority of crop farmers need to increase the fertility of their soils to achieve good crop yields. Produce management has to improve to add more value to more products. Farmers in the fertile areas also need to maintain the fertility of their soils, as frequent cropping depletes the soil of nutrients. How farmers improve or maintain soil fertility is central to the sustainability of their operation.

The important fact derived from the mentioned aspects is that farmers need to produce more tonnage per hectare to keep up with food security in South Africa. New and more productive farming methods and cultivars / breeds linked to value

adding (agro-processing) can make the difference in all the nine provinces in South Africa.

Table 3.1: South Africa's population growth from 2000 to 2018 and forecast to 2050

Year	Population	% Male	% Female	Density (km²)	Population Rank	Growth Rate
2018	57,398,421	49.06%	50.94%	47.01	25	1.20%
2017	56,717,156	49.08%	50.92%	46.45	25	1.25%
2016	56,015,473	49.09%	50.91%	45.88	24	1.31%
2015	55,291,225	49.10%	50.90%	45.28	24	1.40%
2010	51,584,663	49.10%	50.90%	42.25	24	1.11%
2005	48,820,586	49.08%	50.92%	39.98	24	1.32%
2000	45,728,315	49.07%	50.93%	37.45	27	1.67%
Year	**Population**	**% Male**	**% Female**	**Density (km²)**	**Population Rank**	**Growth Rate**
2020	58,721,229	49.03%	50.97%	48.09	25	0.00%
2025	61,790,036	48.97%	51.03%	50.6	24	1.02%
2030	64,465,553	48.93%	51.07%	52.8	25	0.85%
2035	66,880,284	48.92%	51.08%	54.77	26	0.74%
2040	69,076,390	48.92%	51.08%	56.57	25	0.65%
2045	71,045,890	48.94%	51.06%	58.18	26	0.56%
2050	72,754,583	48.94%	51.06%	59.58	27	0.48%

Sources:

1. Statistics South Africa
2. World Population Prospects (2017 Revision) - United Nations population estimates and projections.Total population: Estimated to be consistent with the 1951, 1960, 1970, 1980, 1985, 1991, 1996, 2001 and 2011 censuses, adjusted for under enumeration, with official population estimates for 2014, and with estimates of the subsequent trends in fertility, mortality and international migration. The populations of Transkei, Bophuthatswana, Venda and Ciskei are included in the estimates.
3. GeoNames Gazetteer

3.2 Population and land use trends in South Africa and the Free State

The mentioned population growth figures in South Africa are also responsible for specific trends in the population and also need to be explored in the light of the fact that urbanisation has played an important role in South Africa over the past ten to fifteen years.

Many changes occurred from 2008 to 2018 in the South African market environment. These changes can have a huge impact on food production and the agro-processing sector. The major changes are as follows:

- Population increased from 49.56 million in 2008 to 57.39 million in 2018.
- Average household income increased from 2008 to 2017 from R6 771 to R11 017 per home.
- Living standard measurement research tool indicated the following changes from 2008 to 2015:

Table 3.1: Living Standard Measurement (LSM) Groups in South Africa, 2008 to 2015*.

LSM	2008	2015
LSM 1-4	35.8 mil	Decrease to 22.5 mil
LSM 5-6	33.7 mil	Increase to 39.1mil
LSM 7-8	16.3 mil	Increase to 22.1 mil
LSM 9-10	14.3 mil	Increase to 16.4 mil

Source: SAARF, 2017

*No newer LSM data currently available

As can be seen from Table 3.1, there is an important trend. The living standards of all LSM groups, except LSM 1 to 4, increased from 2008 to 2015. The following are also some contributing factors to the increased living standard:

- Education levels increase from 41.2 % to 48.5 % for matric and higher education
- Unemployment levels increase from 22.6 % to 27.7 % and the full-time workforce declines from 39.3 million in 2008 to 28.5 million in 2017
- 32 million people were urbanised in 2008. This statistical change in 2017 to 36.1 mil people who are urban means that 62.9% of the population is living in urbanised areas.
- Demographic change from 2008 to 2017 as follows (see Table 3.2):

Table 3.2: Demographic trends in the different provinces in South Africa, 2008 to 2015.

Demographic	2008	2017
Gauteng	21.5 %	Increase to 24.1%
Natal	21.2%	Decrease to 19.9%
E-Cape	13.5%	Decrease to 12.6%
W-Cape	10.9%	Increase to 11.3%
Limpopo	10.8%	Decrease to 10.4%
N-West	6.7%	Stay unchanged on 6.7%
N-Cape	2.2%	Decrease to 2.1%
Mpumalanga	7.5%	Increase to 7.8%
Free State	5.7%	Decrease to 5.1%

Source: SAARF, 2017

Linking up with the golden thread of this document, namely the need to know more about the current state of affairs in the agro-processing industry, is the fact that there is a drop in population figures in some provinces and specifically in the Free State. This can have a negative impact on food and processed food consumption in a province and a need exists then to export to other provinces. Specifically for this reason, this agro-processing report is of critical importance for the growth and development in the Free State province because it provides an indication of how agro-processing has to be strategically planned in the province. The marketing of agro-processed products also needs to receive more attention and the following part gives an idea of how marketing media also changed over time.

The following changes in the marketing media segment were observed:

Table 3.3: Changes in marketing media

Marketing Media	**2008**	**2017**
Newspapers	48.6 mil	Users decrease to 44.9 mil
Magazines	40.0 mil	Users increase to 45.8 mil
TV	83.7 mil	Users increase to 92.2 mil
Radio	94.1 mil	Users decrease to 91.8 mil

Cellphones	67.9 mil	Users increase to 89.3 mil
Internet	8.1 mil	Users increase to 32.3 mil

Source: SAARF, 2017

The above-mentioned media changes are also a good indication of what media to use to make sure you get your product to the right target market. It is very important for organisations to change their marketing strategies to adapt to these changes in order to be successful.

This year, the Free State population density was 21.7 p/km². If the population growth rate were the same as in the period 2011-2015 (+0.65%/year), the Free State population in 2018 would be *2 873 380*. With the population in mind, it is also important to look at available farm land that is not in productive use with a view to the production of possible new and more value-adding products.

The data sheet below indicates the total farmland available and the total farmland used. The available farmland excludes land held by all governmental structures.

Table 3.4: Total farmland available per province

Province	Total area	Farmland	Available
	ha		%
Total agriculture in SA	122 320 100	100 665 792	22%
Free State	***12 943 700***	***11 760 100***	***10%***
Western Cape	12 938 600	11 560 609	12%
Northern Province	11 960 600	10 548 290	13%
Eastern Cape	17 061 600	14 817 723	15%
North West	11 871 000	10 098 473	18%
Northern Cape	36 338 900	29 543 832	23%
KwaZulu-Natal	9 148 100	6 529 315	40%
Mpumalanga	8 181 600	4 978 827	64%
Gauteng	1 876 000	828 623	126%

Source: Grain SA, 2018

If one considers the fact the field crops can be cultivated in very specific areas only, the fact that the Free State only has 10% arable land available makes the scope for expansion very narrow. When one removes KwaZulu-Natal, Mpumalanga and Gauteng, then the available land is only 15% on average among the other provinces. This changes the picture considerably.

The graph below indicates the land usage per province.

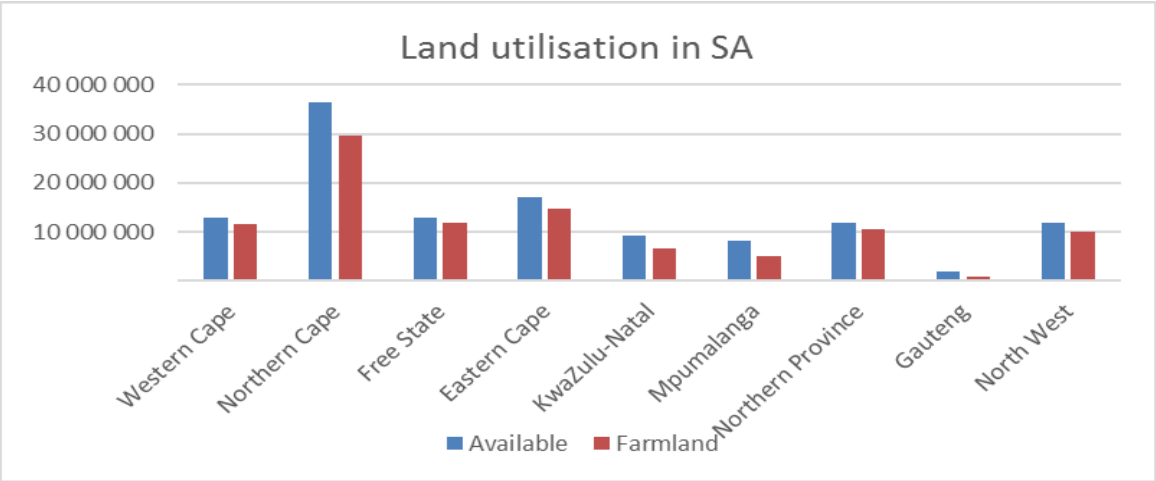


Figure 3.1: Total land utilisation per province in South Africa

Source: Grain SA, 2018

The table below indicates the change in the debt responsibility by institution.

Table 3.5: Change in farm debt responsibility per institution in South Africa

	Land and Agricultural Bank	Commercial banks	Agricultural cooperatives	Department of Agriculture	Private persons	Other financial institutions	Other debt
2008	13 835,4	31 700,4	6 110,5	287,9	2 951,7	895,0	1 631,5
2009	13 218,2	37 689,8	7 268,0	242,1	2 978,5	903,1	1 646,3
2010	14 409,3	42 152,4	7 633,9	198,6	3 005,6	911,3	1 661,3
2011	19 792,0	45 805,6	7 954,0	183,4	3 033,0	919,6	1 676,4
2012	26 202,2	48 352,8	8 410,4	133,4	3 060,6	928,0	1 691,6
2013	30 905,9	57 053,0	8 710,1	106,6	3 088,4	936,4	1 707,0
2014	35 579,8	66 345,3	8 783,6	82,9	3 116,5	944,9	1 722,6
2015	37 804,1	80 040,4	9 337,8	70,2	3 144,9	953,5	1 738,2
2016	39 628,9	89 382,5	10 013,3	66,7	3 173,5	962,2	1 754,0
2017	43 987,6	97 099,9	11 260,4	51,6	3 202,3	971,0	1 770,0
2008	13 835,4	31 700,4	6 110,5	287,9	2 951,7	895,0	1 631,5
2009	13 218,2	37 689,8	7 268,0	242,1	2 978,5	903,1	1 646,3
2010	14 409,3	42 152,4	7 633,9	198,6	3 005,6	911,3	1 661,3
2011	19 792,0	45 805,6	7 954,0	183,4	3 033,0	919,6	1 676,4
2012	26 202,2	48 352,8	8 410,4	133,4	3 060,6	928,0	1 691,6
2013	30 905,9	57 053,0	8 710,1	106,6	3 088,4	936,4	1 707,0
2014	35 579,8	66 345,3	8 783,6	82,9	3 116,5	944,9	1 722,6
2015	37 804,1	80 040,4	9 337,8	70,2	3 144,9	953,5	1 738,2
2016	39 628,9	89 382,5	10 013,3	66,7	3 173,5	962,2	1 754,0
2017	43 987,6	97 099,9	11 260,4	51,6	3 202,3	971,0	1 770,0

Source: Grain SA, 2018

The graphics below show the change in the exposure to debt. The change is also very significant.

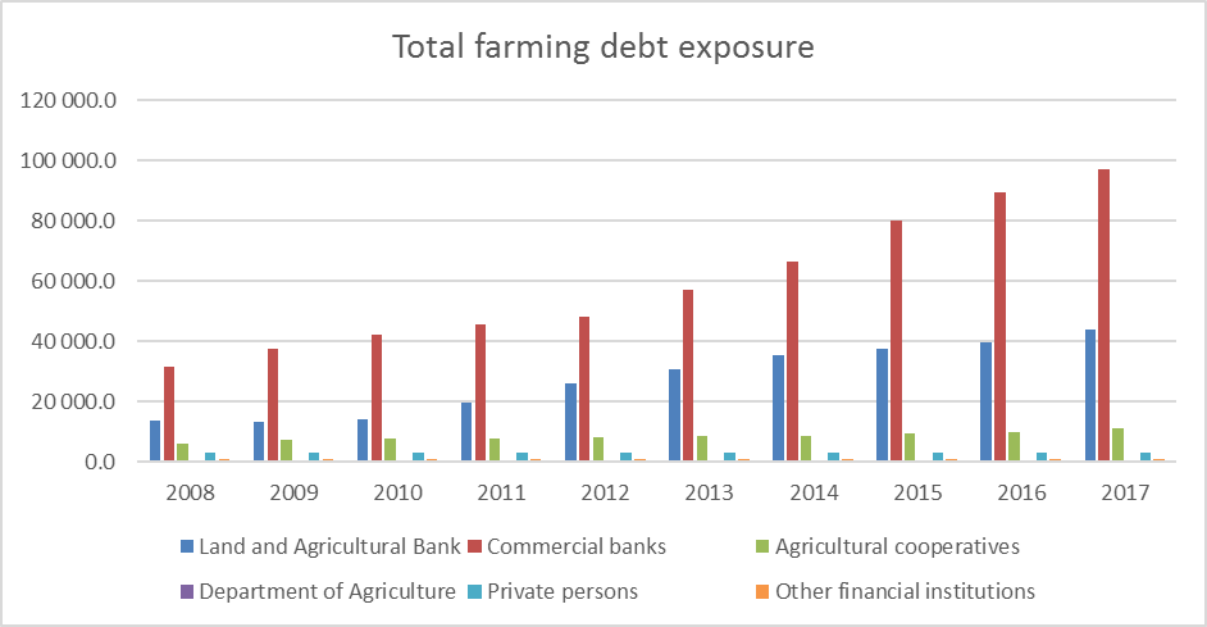


Figure 3.2: Total farm debt exposure per institution in South Africa

Source: Author's own creation from statistics from Grain SA, 2018

It is evident from the graph that the exposure of the Land and Agricultural Bank and Commercial banks has increased over the last few years. The graph below indicates the steep increase in debt extended by the Land and Agricultural Bank specifically.

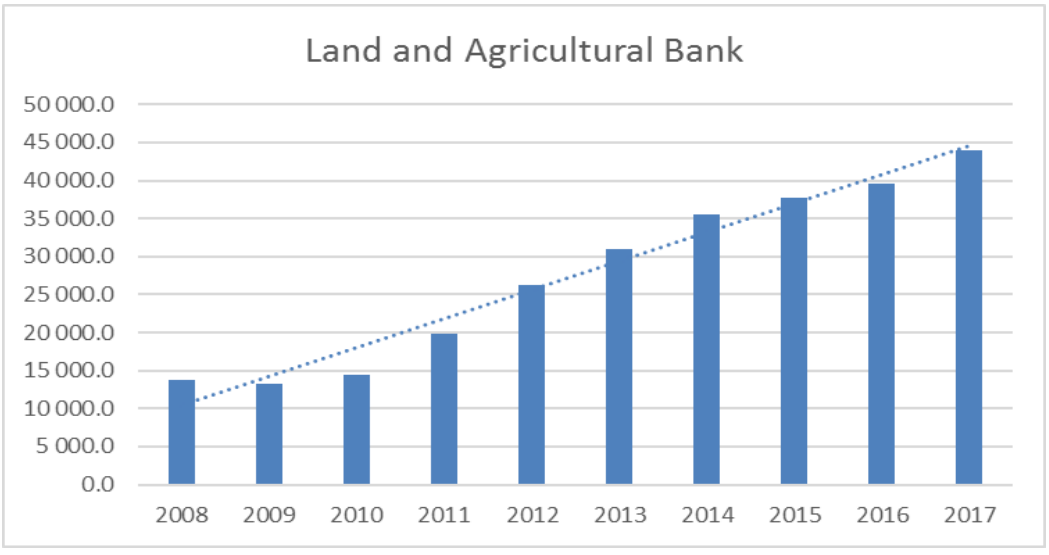


Figure 3.3: Land and Agricultural Bank exposure to farm debt in South Africa

Source: Grain SA, 2018

In contrast, financial assistance from the Department of Agriculture has decreased, as indicated in Figure 3.4. This decrease in assistance is partly the cause of the problem in respect of the establishment of new farming activities as well as new agro-processing businesses.

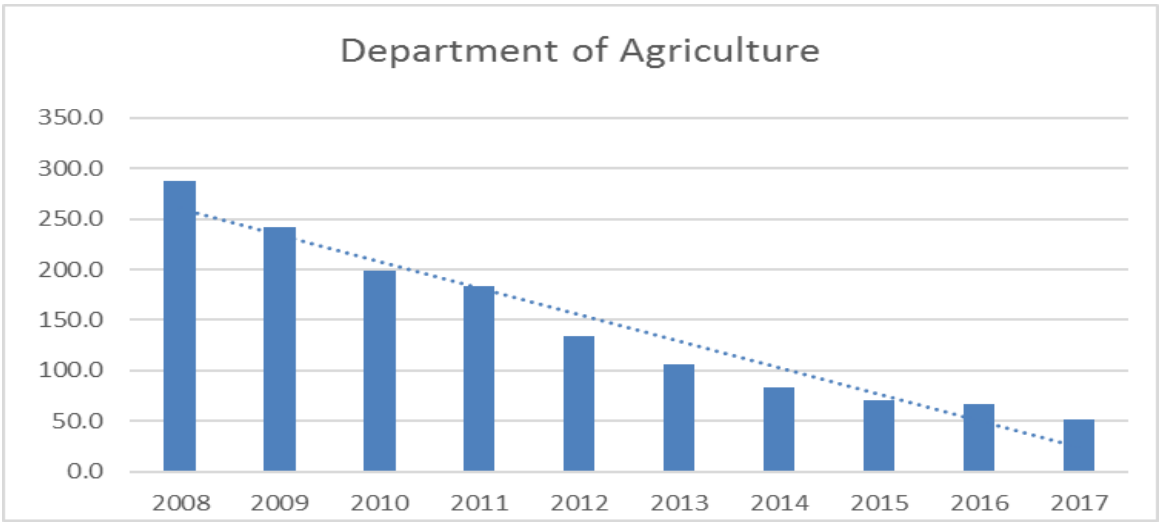


Figure 3.4: Department of Agriculture assistance to farming in South Africa

Source: Grain SA, 2018

3.3 Agricultural trends in the Free State

Statistics on agricultural employment differ according to definition and source, but it is safe to say that the sector employs around 849 000 workers (http://www.agriec.co.za/blog/posts/concerning-decrease-in-agriculture-jobs-in-south-africa). This makes the sector one of the biggest employers in the economy. It is also important to note that the sector is labour-intensive compared to other sectors, because it employs about 4,6% of the total labour force.

The mining and manufacturing sectors, in comparison, represent 8,5% and 12,5% of the economy whilst employing only 2,3% and 11,8% of the labour force respectively. The agricultural sector therefore uses two units of labour per unit of value added, whilst the ratio is 0,3 and 0,94 for the mining and manufacturing sectors (Greyling, J. 2015).

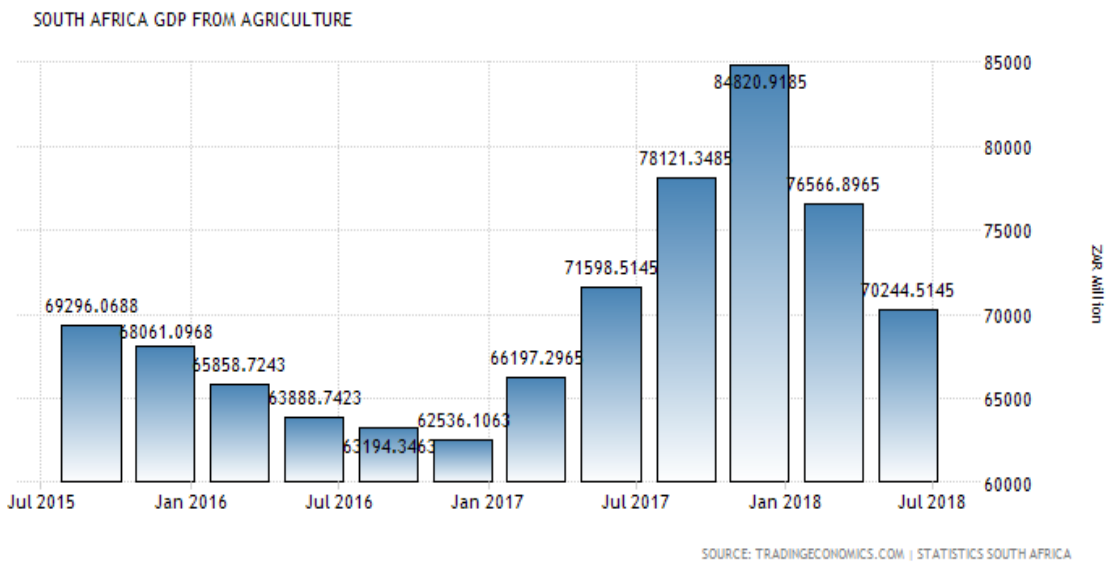


Figure 3.5: South Africa GDP from agriculture

The fact that the sector represents less than 2,5% (see figure 3.5) of the economy does not provide the true picture of the sector's impact on the greater economy since the sector does not operate in a vacuum – it buys inputs from the manufacturing sector, provides raw materials for manufacturing and purchases a host of services. The question is: How big is the impact of the sector?

One of the ways of looking at it is to sum up the GDP share of primary agriculture and all closely related sectors, i.e. agribusinesses. Examples of agribusinesses would include farming operations, input manufacturers, input suppliers and co-ops, food processors, distributors and traders, and others. The research shows that the agricultural and related sectors represented around 7% of GDP in 2010.

This approach, though correct, is limited because it simply looks at the direct contribution of the sector to GDP. An interesting alternative is the use of multipliers to estimate the indirect impact of changes in the sector on the rest of the economy. These multipliers, calculated from national statistics, show that primary agriculture has a backward linkage of 2,14 (the fifth highest in a 20 sector grouping of the economy).

This means that a R1 million increase in demand for agricultural output will increase the combined output of the other production sectors in the economy by R2,14 million (inclusive of the original R1 million of the agricultural sector output). The closely

related food, beverage and tobacco industry is calculated at 2,3 – giving it the third position. (Greyling, J. 2015)

The calculated forward linkage of the sector is 1,81 (the 18th highest of a 20 sector grouping of the economy). If there is a R1 million increase in the cost of value added in the agricultural sector, then the combined value of output of the other sectors in the economy will increase by R1,81 million as a result of price increases (Greyling, J. 2015)

One would think that the increase in primary food imports would have a negative impact on the agricultural trade balance, but the opposite is true since the country is still a net exporter of agricultural products by value. The sector therefore does not contribute to the negative trade balance.

The deterioration of the country's food self-sufficiency status and maintenance of a positive trade balance can be explained through structural shifts in the allocation of hectares under grain production, composition of agricultural trade and changes in food consumption patterns. This is the result of the deregulation of agricultural marketing and liberalisation of agricultural trade that was completed by the late 1990s.

This resulted in lower grain prices that prompted producers to remove marginal land from crop production, thereby decreasing the area planted under maize and wheat by more than a million hectares respectively.

The country currently imports almost 50% of wheat consumed. On the positive side, this process gave fruit and grape producer's access to the international marketplace where they compete quite successfully. During the 1990s and 2000s, exports in these items grew at an average of 6,5% per year, thereby increasing their share in total agricultural exports from 29% to 68%.

Another major shift is changing meat consumption patterns in response to price. Per capita beef consumption declined from its highest level of 24 kg per person per year during the 1980s to the current level of around 16 kg per person per year. The

consumption of poultry on the other hand grew from 6 kg per person per year to the current level of 36 kg per person per year, of which 25% was imported in 2016/2017.

Collectively these trends underscore the importance of continued investment in transport infrastructure in order to ensure that food items can be produced and moved cost-effectively. This is particularly important from a food security perspective since these items represent a large portion of the budget of a low-income household. Such investments are also important for ensuring and expanding the competitiveness of our high-value food exports (Greyling, J. 2015).

When looking at field crop production in the Free State, the following paragraphs, tables and figure spell out the trends. A field crop is a crop (other than fruits or vegetables) that is grown for agricultural purposes. (https://www.vocabulary.com/dictionary/field%20crop).

Maize is the first field crop to be discussed in detail.

Table 3.6: Maize: area planted, production, producer prices, producer price index and gross value

Production year	Area planted	Total production[1]	Gross value of production[1]	Producer prices[2]			
				Gross		Net	
				White	Yellow	White	Yellow
	1 000 ha	1 000 t	R1 000	R/ton			
2009/10	3 263	13 421	13 485 988	1 097,91	1 131,50	#	#
2010/11	2 859	10 924	16 725 290	1 691,66	1 636,14	#	#
2011/12	3 141	12 759	25 123 585	2 200,12	2 162,51	#	#
2012/13	3 238	12 486	25 051 453	2 026,56	2 123,98	#	#
2013/14	3 096	14 925	28 496 153	2 122,15	2 160,32	#	#
2014/15	3 048	10 629	24 858 545	2 502,41	2 255,26	#	#
2015/16	2 213	8 214	26 472 758	4 025,09	3 140,50	#	#
2016/17	2 997	17 551	29 824 219	1 902,98	1 982,23	#	#
2017/18	2 607	12 783	*	*	*	#	#

Source: Grain SA, 2018

The graph below indicates the steady decrease in the total ha of maize planted in South Africa.

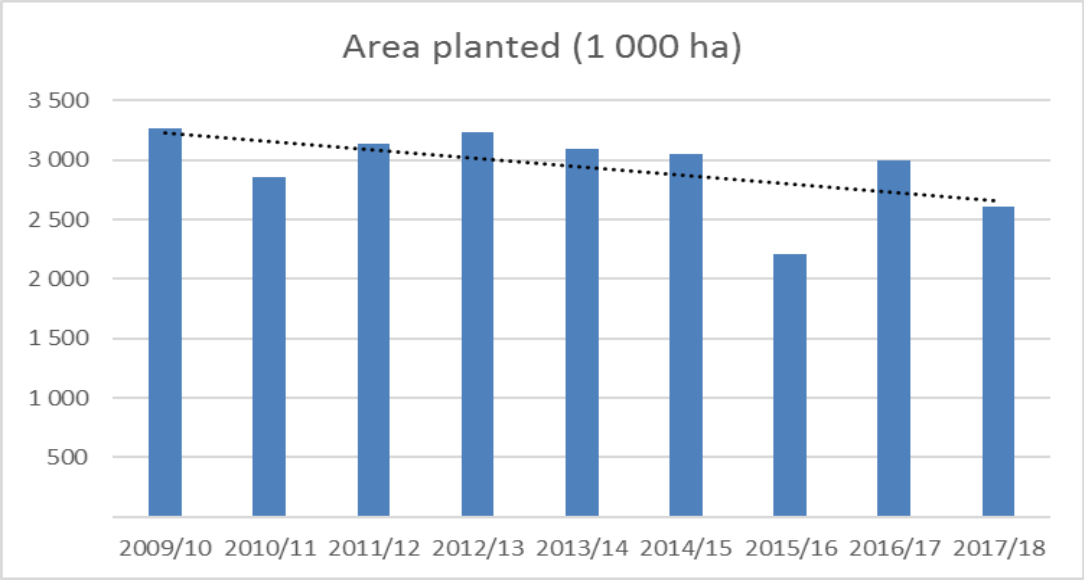


Figure 3.6: Total area (ha) maize planted in South Africa

Source: Grain SA, 2018

The table below indicates a slight increase in the production of maize against a definite decrease in total ha planted.

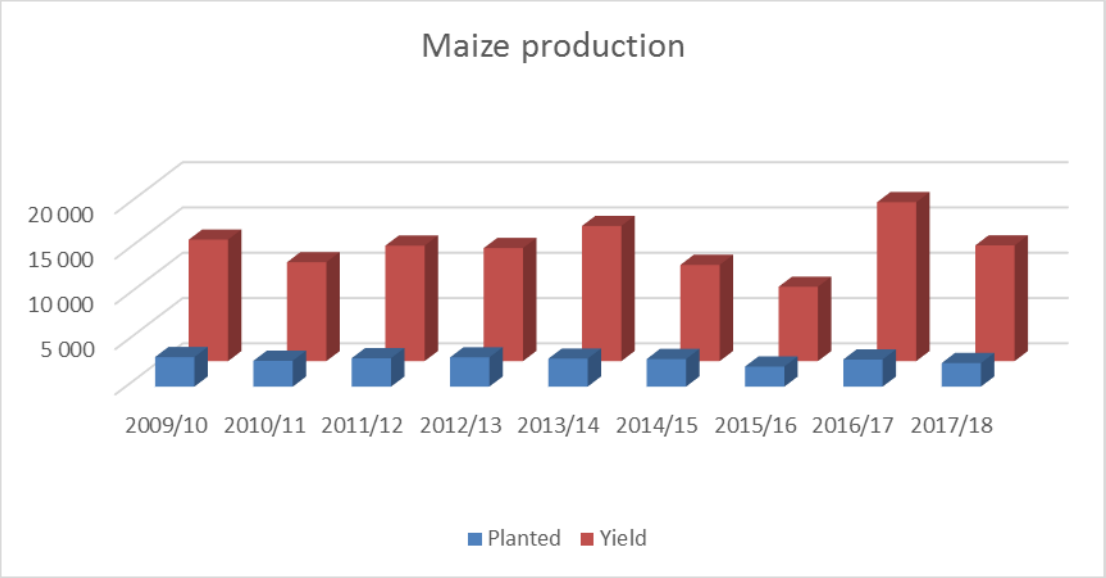


Figure 3.7: Increase in maize production in South Africa

Source: Author's own creation with stats from Grain SA, 2018

The graph needs to be analysed more to identify which province is the main contributor. Figure 3.8 outlines the production per province.

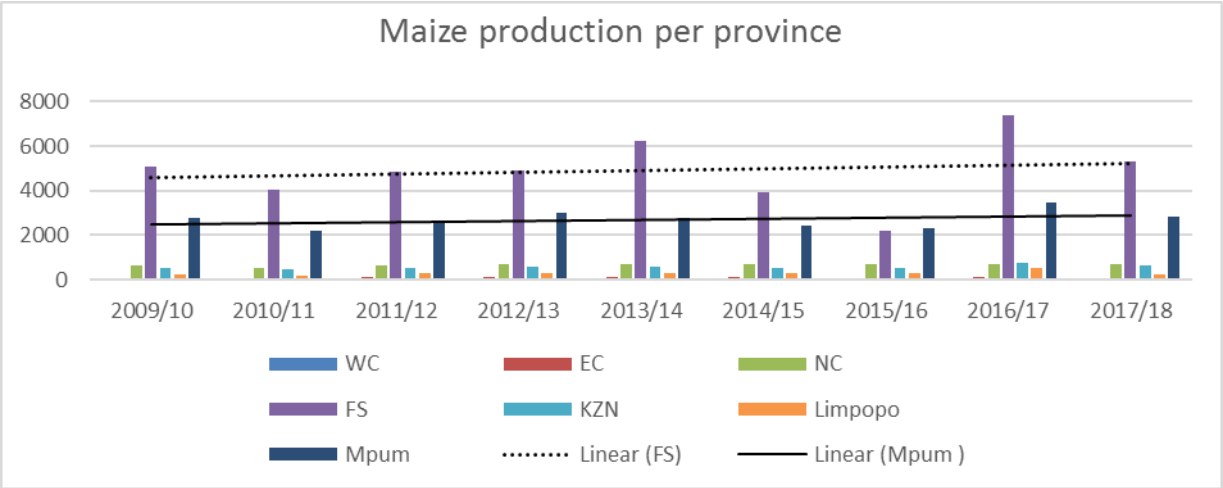


Figure 3.8: Maize production per province in South Afric Source: Author's own creation with stats from Grain SA, 2018

The Free State province remains the most significant contributor to the total maize crop by far. Mpumalanga is the second largest producer, but far behind the Free State. This is evident in the raw data table below.

Table 3.7: Free State maize production contribution in South Africa

Production year	WC	EC	NC	FS	KZN	Limpopo	Mpum	Total	FS % Contribution
2009/10	18	80	609	***5 076***	524	210	2 745	9 262	55%
2010/11	14	68	538	***4 052***	450	173	2 190	7 485	54%
2011/12	30	93	617	***4 823***	512	274	2 529	8 878	54%
2012/13	33	108	675	***4 885***	599	292	3 005	9 597	51%
2013/14	33	111	664	***6 247***	559	307	2 783	10 704	58%
2014/15	38	100	679	***3 944***	508	281	2 429	7 979	49%
2015/16	45	76	710	***2 214***	522	310	2 319	6 196	36%
2016/17	22	97	712	***7 362***	740	492	3 431	12 856	57%
2017/18	14	70	667	***5 331***	611	217	2 831	9 741	55%

Source: Author's own creation with stats from Grain SA, 2018

Over the past 9 seasons, the Free State province has been the single most significant contributor to the maize crop. Because of the tonnage of maize produced in the Free State, many Cooperatives are involved in handling this produce, from only receiving and storing the product to value adding like maize meal milling.

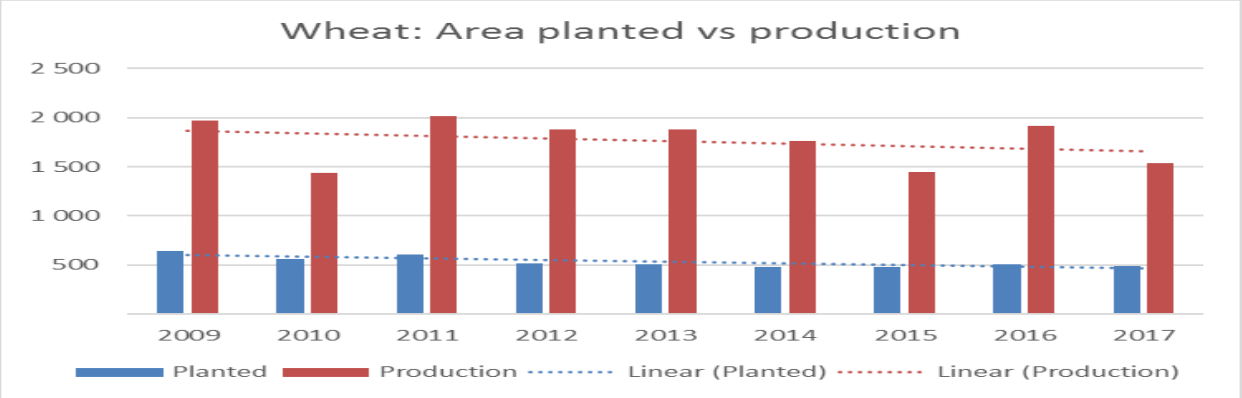


Figure 3.9: Wheat planted (ha) and production in South Africa

Source: Author's own creation with stats from Grain SA, 2018

The next field crop in South Africa is wheat. The findings around wheat production were very surprising. The graph does not only indicate a decrease in the total ha's planted but also in production.

The contribution to the total crop per province identifies the fact that the Free State province has had significantly less production. The Western Cape experienced an increase in production.

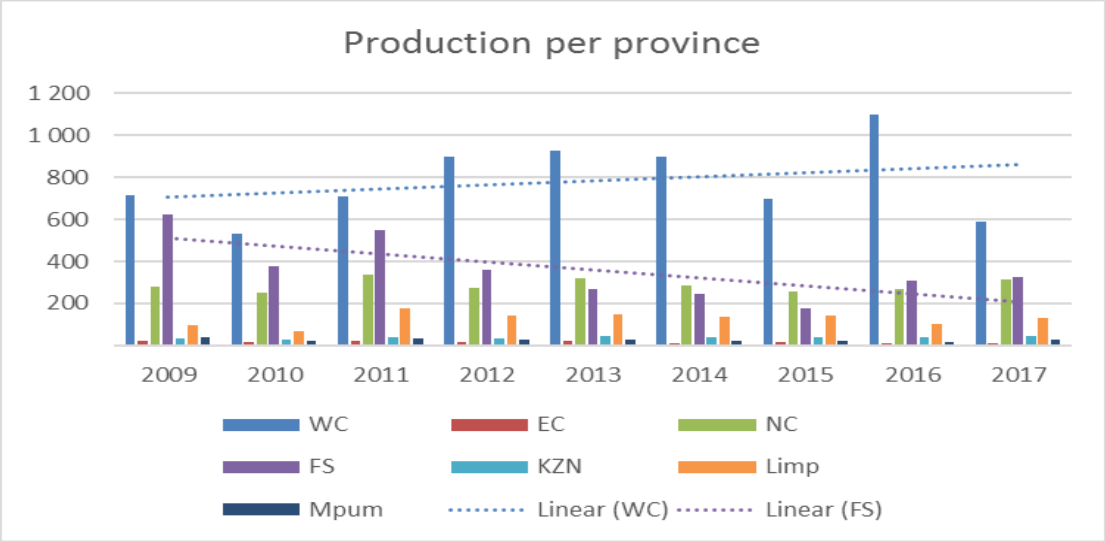


Figure 3.10: Wheat production per province in South Africa

Source: Author's own creation with stats from Grain SA, 2018

Sorghum is another field crop that was interesting to analyse. The sorghum total ha's planted as well as the total production has decreased significantly. See Figure 3.11.

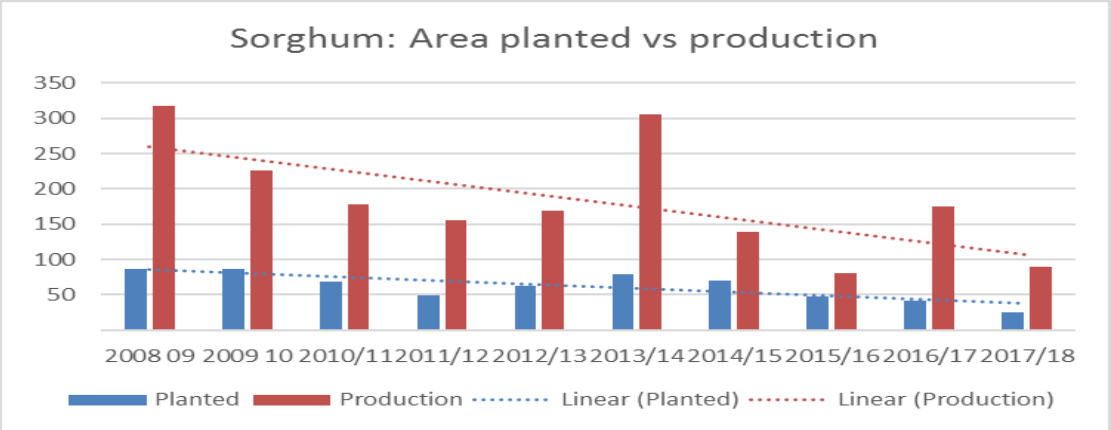


Figure 3.11: Sorghum planted (ha) and production in South Africa

Source: Author's own creation with stats from Grain SA, 2018

A further analysis indicates that the production output from the Free State province has decreased by approximately 25% per annum. This is an indication that there is no real potential to produce and add value to sorghum.

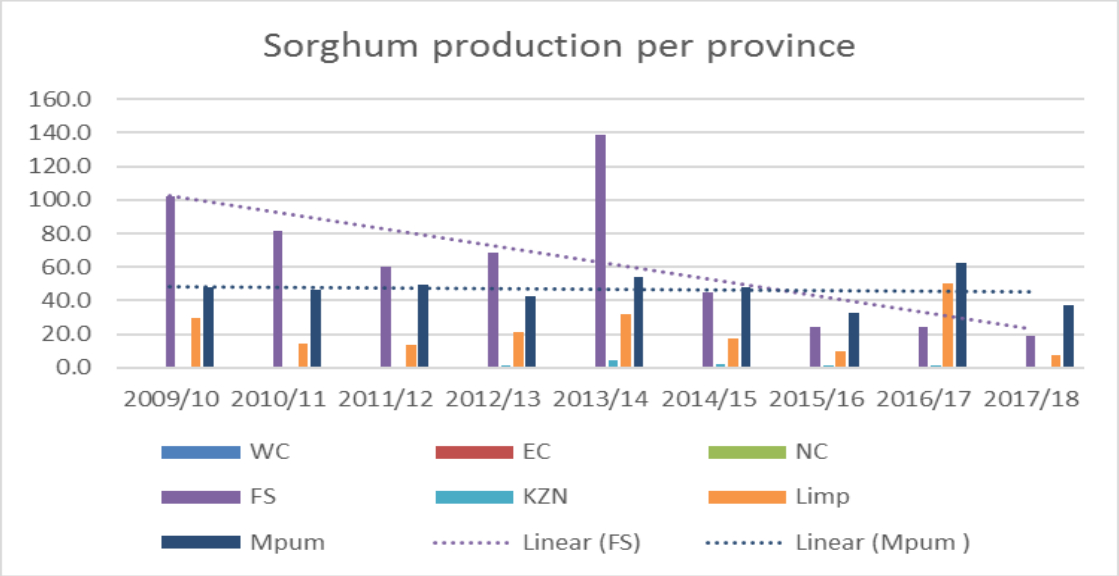


Figure 3.12: Sorghum production per province in South Africa

Source: Author's own creation with stats from Grain SA, 2018

The statistics for groundnuts indicate that the total ha's planted remain more or less the same. The yield per ha seems to have decreased slightly, according to Figure 3.13.

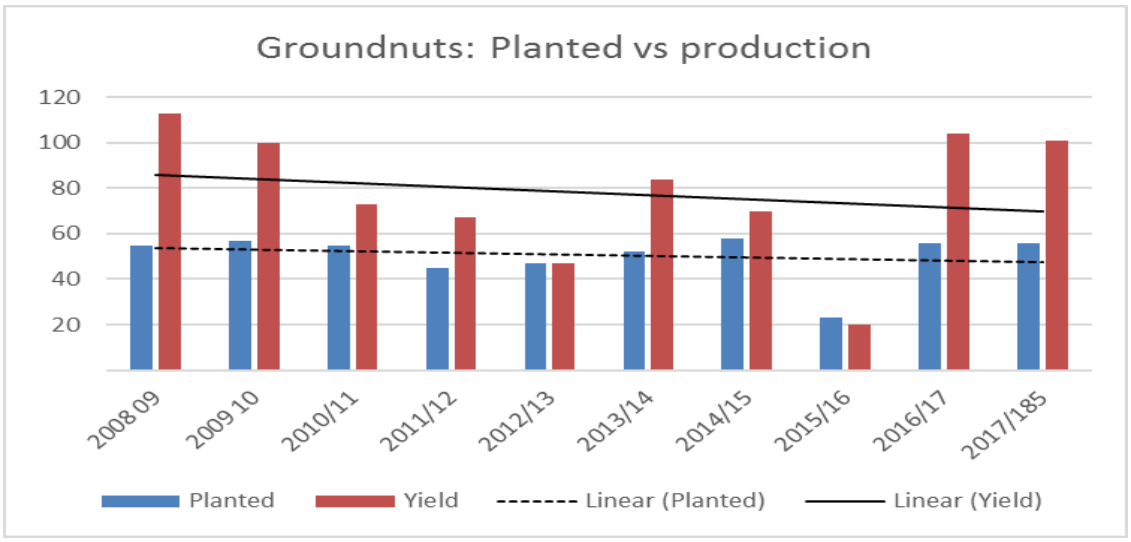


Figure 3.13: Groundnuts planted (ha) and production in South Africa

Source: Author's own creation with stats from Grain SA, 2018

A further analysis of the data available indicates that the Eastern Cape produced significantly less, with the Free State being the most significant contributor.

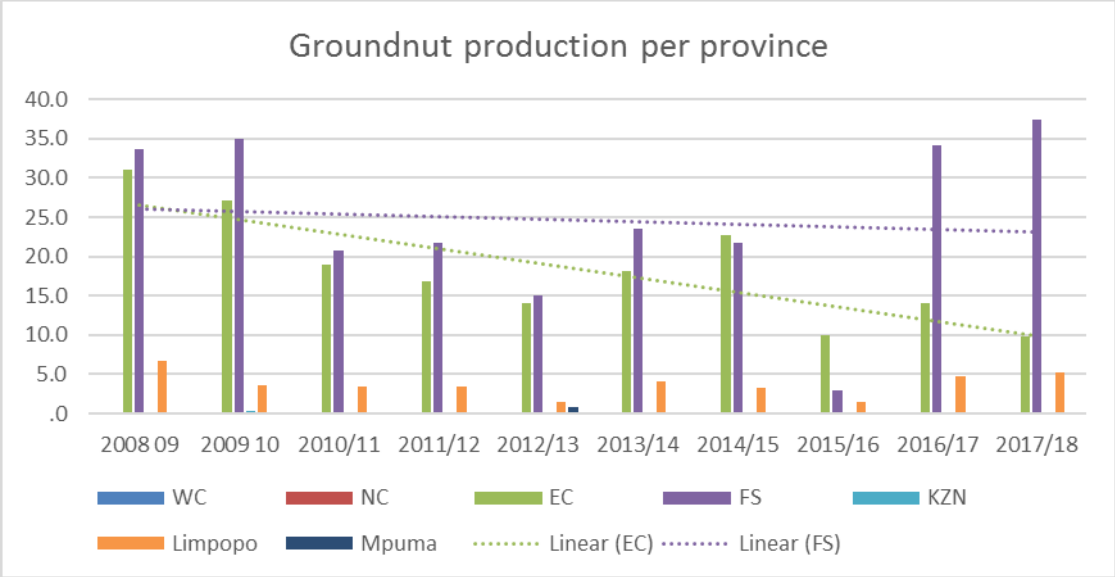


Figure 3.14: Groundnut production per province in South Africa

Source: Author's own creation with stats from Grain SA, 2018

The table below indicates the processed use of groundnuts.

Table 3.8: The processed use of groundnuts in South Africa

Marketing year: March to February	S A Deliveries	SA processed				Exports
		Oil and oilcake	Peanut butter and direct edible market	Seed and unshelled[1]	Total	Edible groundnuts
	Tons					
2008 09	89 800	1 000	63 800	3 900	68 700	22 600
2009 10	88 900	1 900	57 700	2 600	62 200	15 600
2010 11	83 800	6 100	63 000	2 200	71 300	28 700
2011/12	59 313	2 500	57 100	2 900	62 500	20 100
2012/13	57 256	2 400	50 700	2 900	56 000	15 300
2013/14	40 346	1 491	52 029	3 589	57 109	10 443
2014/15	71 272	2 988	49 850	3 849	56 687	12 136
2015/16	59 992	2 882	61 118	2 215	66 215	15 426
2016/17	17 212	803	59 521	2 970	63 294	8 408
2017/18	91 390	2 361	60 893	4 118	67 372	10 560

Source: Author's own creation with stats from Grain SA, 2018

A salient feature of the statistics is the narrow processing focus. More than 60% of the total production is used for peanut butter and direct edibles. There is also a slight decrease in exports over the last few years. A reason can be that many co-ops like South West are no longer trading groundnuts.

Soya has become a more important product planted by more maize farmers over the past few years. Soya has shown an increase in both area planted and production.

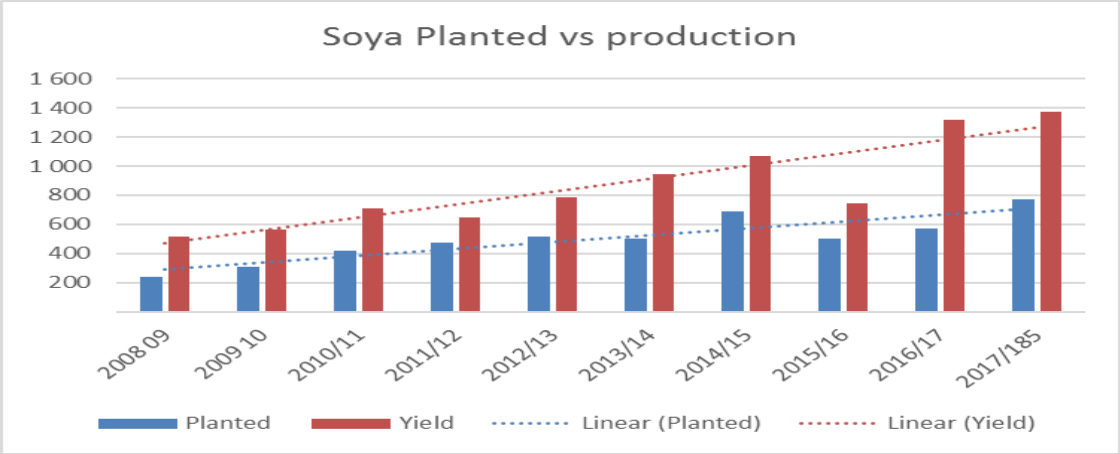


Figure 3.15: Soya planted and (ha) production in South Africa

Source: Author's own creation with stats from Grain SA, 2018

The analysis per province indicates that the Free State has increased its production by 5 times over the past 9 seasons. According to the spokesperson from VKB, who are big on soya processing, there are some opportunities left, but the production is capital intensive.

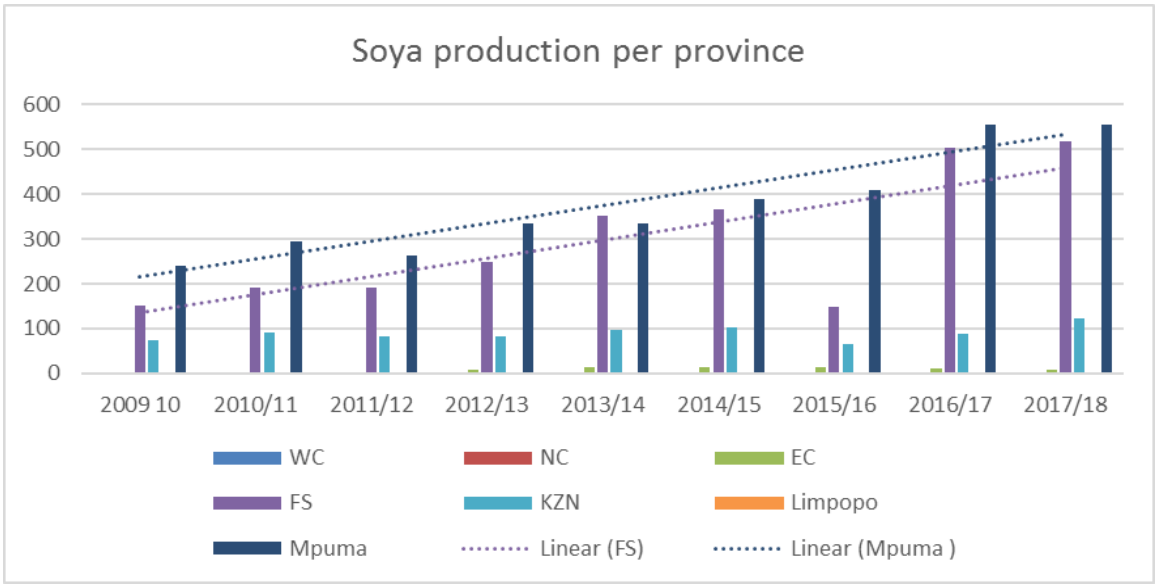


Figure 3.16: Soya production per province in South Africa

Source: Author's own creation with stats from Grain SA, 2018

The table below indicates the key usage of soya.

Table 3.9: The processed use of soya in South Africa

Marketing year: March to February	Producer deliveries	SA processed					Exports
		Oil and oilcake	Full-fat	Human con-sumption	Seed and feed	Total	
	Tons						
2009	503 637	115 200		29 600	172 400	317 200	155 600
2010	534 719	184 100		30 700	203 700	418 500	121 300
2011	685 061	247 300		30 100	154 800	432 200	42 800
2012	623 893	412 333		27 010	150 393	589 736	157 540
2013	759 842	560 095		26 708	167 810	754 613	15 406
2014/15	919 645	861 631		25 319	123 709	1 010 659	576
2015/16	1 042 129	988 024		24 323	129 340	1 141 687	4 677
2016/17	713 660	852 308		23 875	104 396	982 044	6 745
2017/18	1 289 000	890 000		25 500	153 800	1 071 450	450
2018/19	1 344 700	1 000 000		25 000	153 800	1 182 200	500

Source: Author's own creation with stats from Grain SA, 2018

It is very significant that the exports have decreased from 155 600 tons per annum to just 500 tons. Here is a gap in the market worth exploring because the raw product is available and growing in production.

Dry beans have shown a slight increase in area planted and a concomitant increase in production.

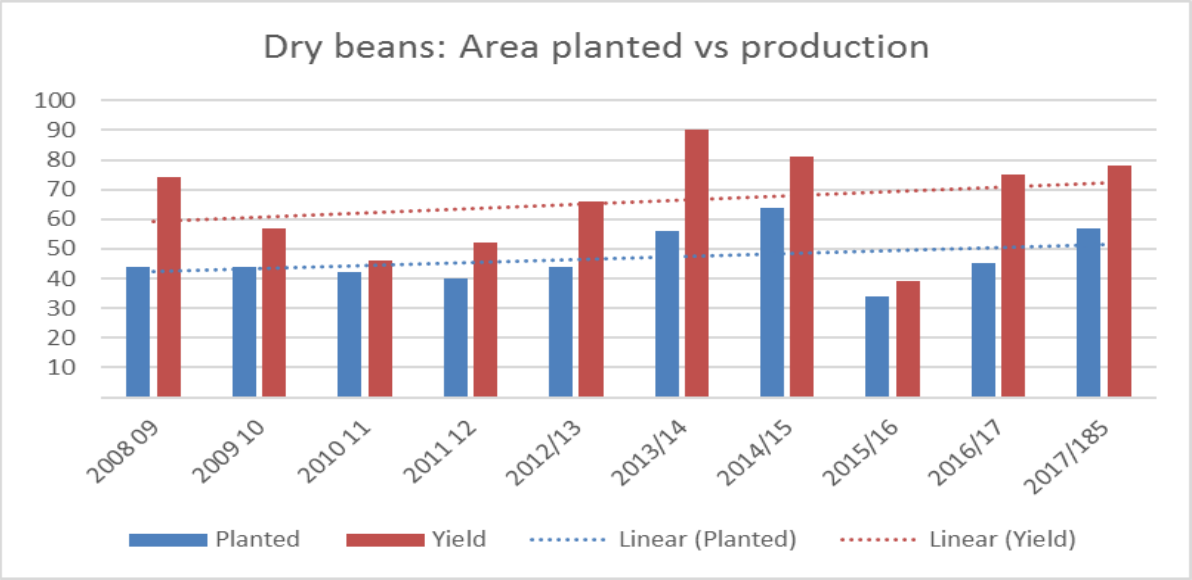


Figure 3.17: Dry beans planted (ha) and production in South Africa

Source: Author's own creation with stats from Grain SA, 2018

The largest gain per province is recorded for the Free State province. Mpumalanga showed the largest decrease in production.

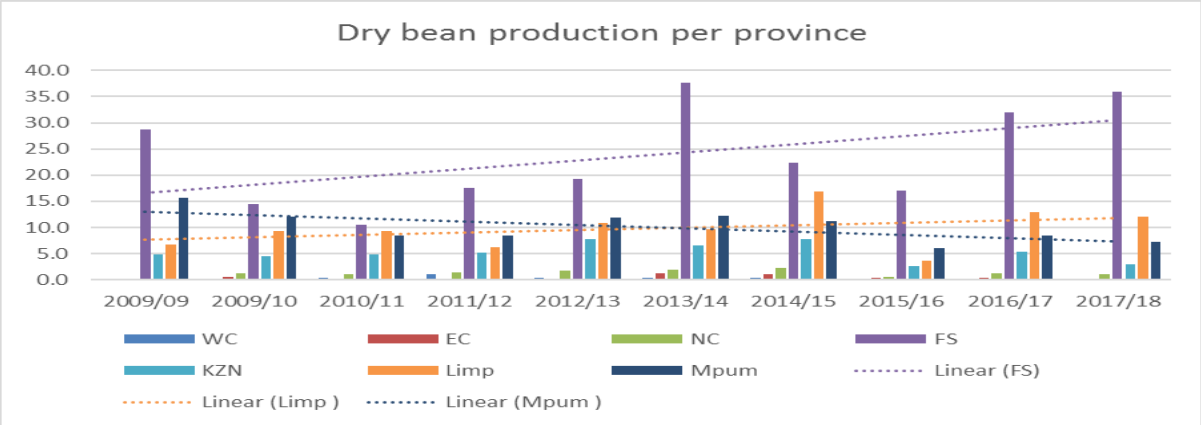


Figure 3.18: Dry bean production per province in South Africa

Source: Author's own creation with stats from Grain SA, 2018

Sunflower is also a field crop that forms part of the production in the Free State.

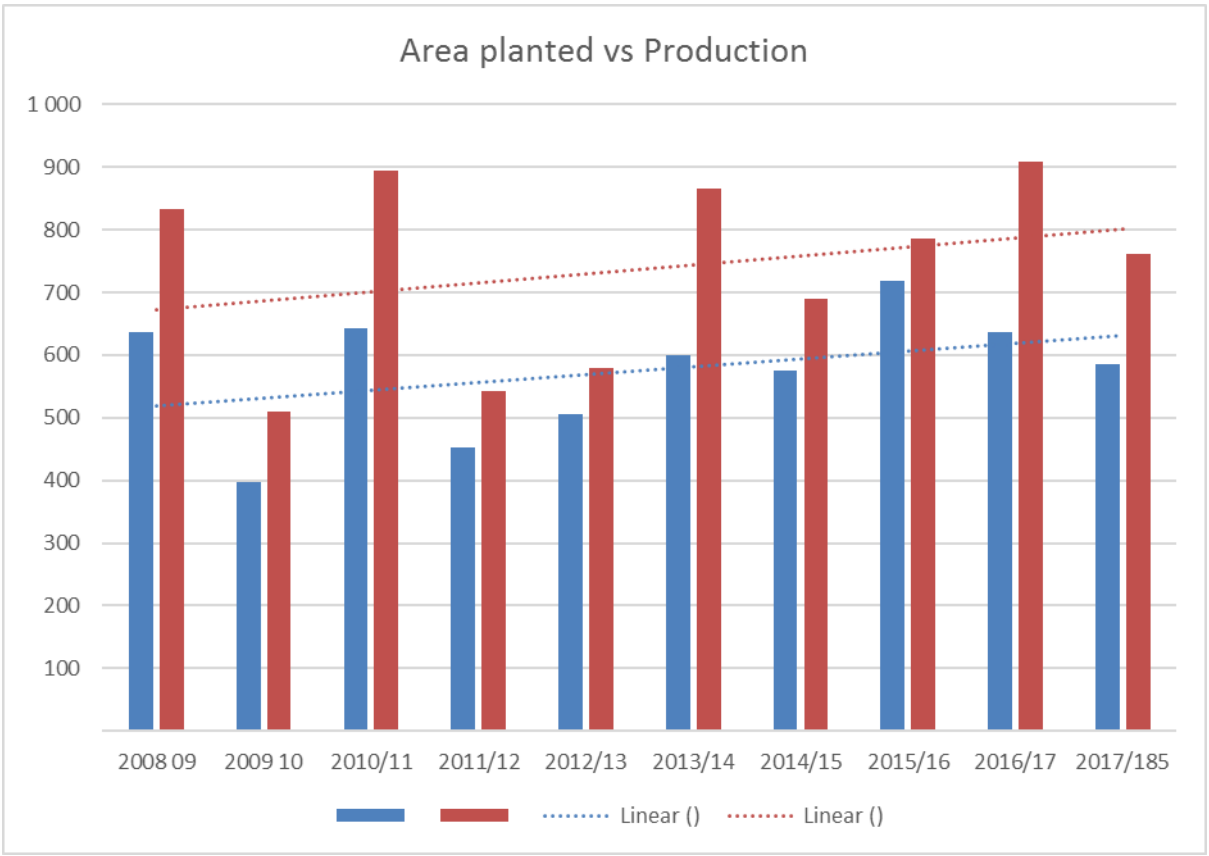


Figure 3.19: Sunflower planted (ha) and production in South Africa

Source: Author's own creation with stats from Grain SA, 2018

As regards the production figure, the Free State is producing the highest tonnage of all provinces. Although there may be scope to plant more sunflower, there is certainly scope to add more value to the product. Not many co-ops are in the value-adding chain of sunflowers this is done mostly by private companies.

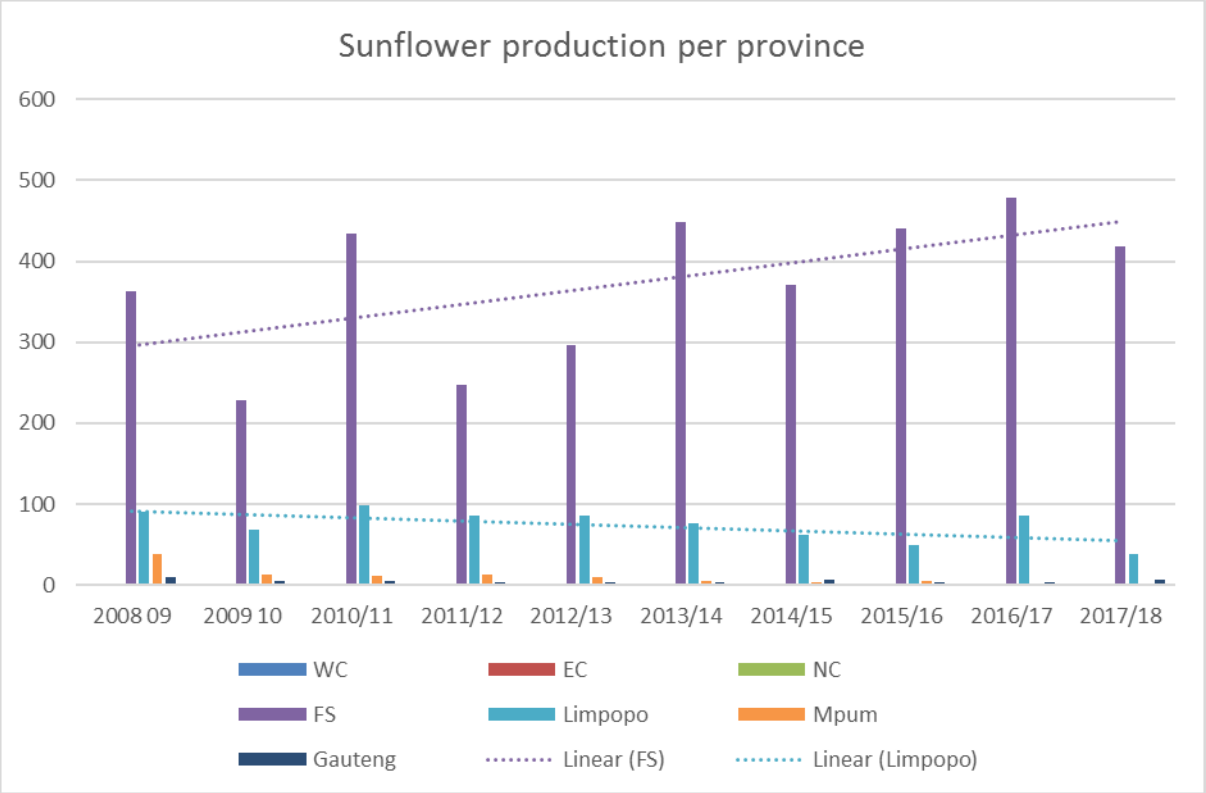


Figure 3.20: Sunflower production per province in South Africa

Source: Author's own creation with stats from Grain SA, 2018

As can be seen from the details in the above-mentioned field crop figure, there are clear trends that can be followed. To achieve sustainability in farming with the aforementioned crops in an arid area like the Free State means undertaking a risk.

The following is important when someone wants to farm with field crops:

- Economies of scale is important. For example, if a farmer farms on 100 hectare and generates an average profit of 300 per ha, the total profit is R30 000 for a season. If another farmer plants on 1000 ha and receives the same profit per ha, the profit for this farmer is R300 000.

- Rain at the right time in the dryland areas is of crucial importance.
- Capital equipment like tractors and planters is getting more sophisticated and expensive and again economies of scale is also applicable here to utilise the expensive equipment well.

Horticultural products. Horticultural products include all products, raw or processed, that arise from the horticultural industry. This broadly inclusive definition is appropriate and even necessary in a time when traceability from the producer to the ultimate consumer is of growing interest to government and industry. Products from the horticultural industry that go to market still respiring (fresh produce) are clearly horticultural products. When juiced, sliced or pureed, fermented, frozen, preserved, canned, dried, irradiated, or used in an ornamental construct (such as a flower arrangement) they remain, a horticultural product. However, when a horticultural product becomes a major ingredient of another manufactured item the categorisation becomes more complex. Thus, when apples are used to make apple pie or yogurt is fortified with fruit, the product can be considered both a horticultural product and a bakery or dairy product.

But to use this definition of a horticultural product, it is necessary to know what crops are appropriately assigned to the horticultural industry. It is generally accepted by researchers and educators in horticultural science that horticultural crops include:

- Tree, bush and perennial vine fruits;
- Perennial bush and tree nuts;
- Vegetables (roots, tubers, shoots, stems, leaves, fruits and flowers of edible and mainly annual plants);
- Aromatic and medicinal foliage, seeds and roots (from annual or perennial plants);
- Cut flowers, potted ornamental plants, and bedding plants (involving both annual or perennial plants); and
- Trees, shrubs, turf and ornamental grasses propagated and produced in nurseries for use in landscaping or for establishing fruit orchards or other crop production units.

Sometimes the horticultural plant is used by an animal to produce the crop. Honey is a good example and is often considered to be a horticultural product. Raw silk is produced by silkworms feeding on mulberry trees (which also produce an edible fruit) but silk is not a horticultural crop. (https://www.merriam-webster.com/dictionary/horticulture).

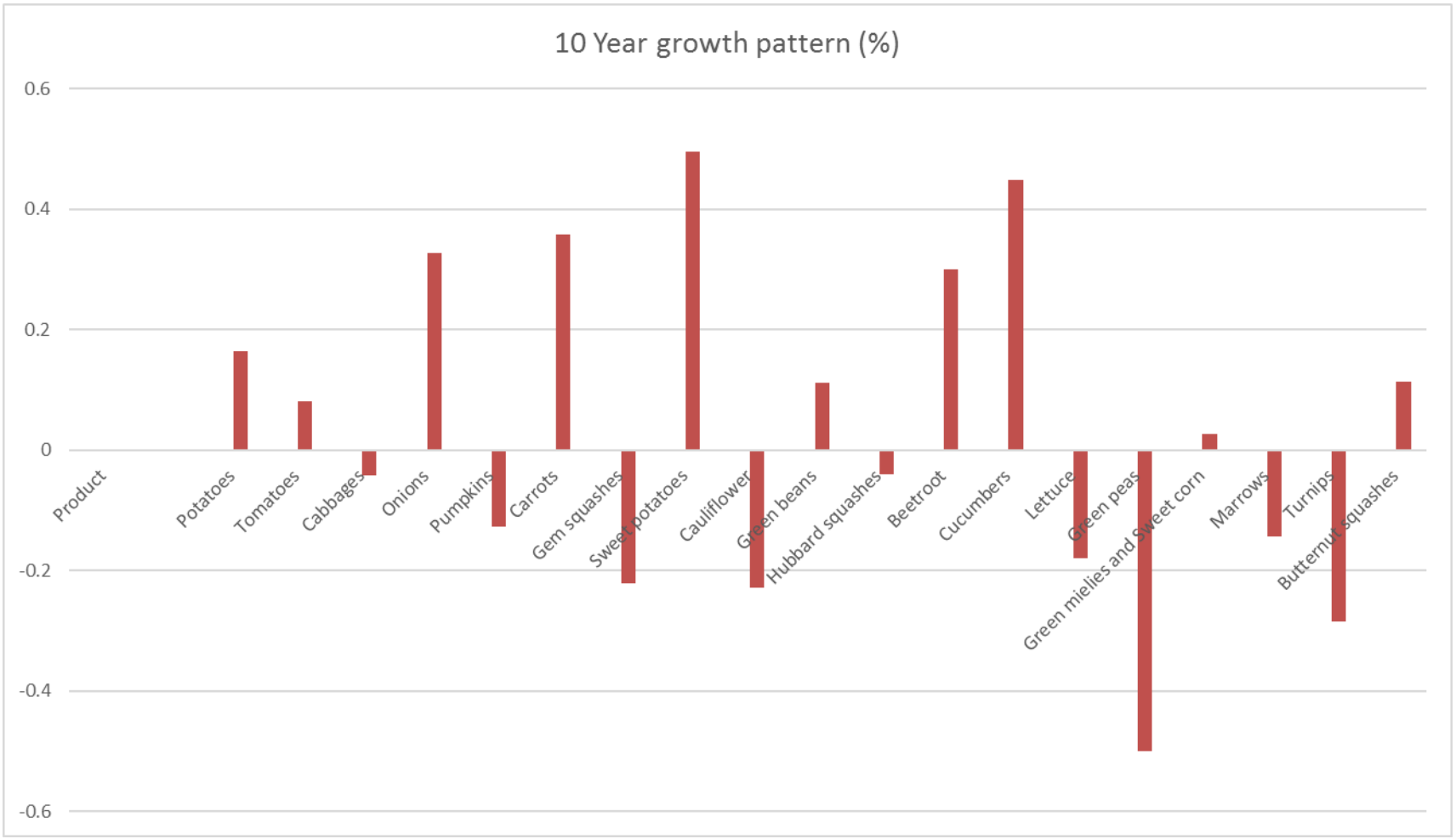


Figure 3.21: Ten-year growth patterns of some horticultural products

Source: Author's own creation, 2018

Figure 3.21 shows that there are a few products whose production is growing. This matter warrants a more detailed exploration of how farmers in the Free State can grow more and can contribute more to agro-processing. The cultivation of sweet potatoes increased the most, followed by cucumbers, carrots and unions.

Lemons and limes are not a common product in the Free State. The area planted and the production output have seen very little growth. The total value of the output is estimated to be an average of 22% per annum.

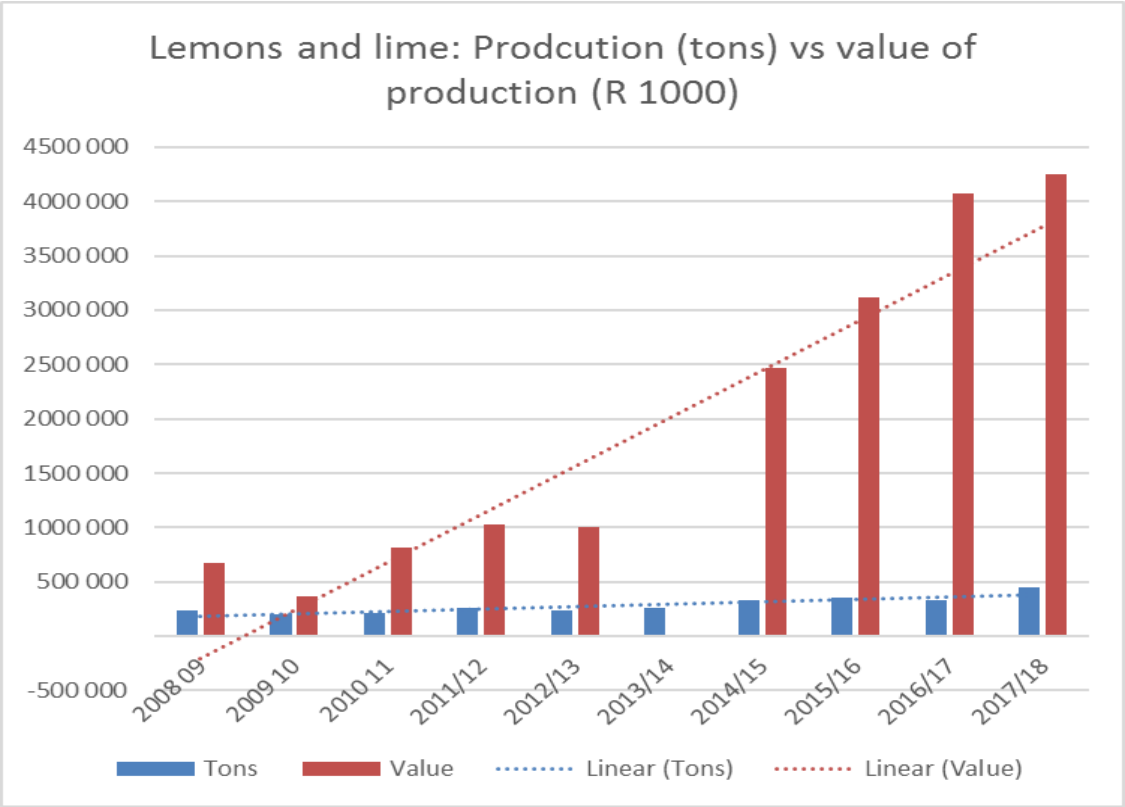


Figure 3.22: Production and value of lemons and limes in South Africa

Source: Author's own creation with stats from Grain SA, 2018

Livestock are domesticated **animals** raised in an agricultural setting to produce labour and commodities such as meat, eggs, milk, fur, leather, and wool. The term is sometimes used to refer solely to those that are bred for consumption, while at other times it refers only to farmed ruminants, such as **cattle,** sheep and goats.

Overview of cattle

The summary table below indicates the growth in meat and milk consumption per capital until 2050.

Table 3.10: Growth in meat and milk consumption per capita till 2050

		Annual *per capita* consumption		**Total consumption**	
		meat (kg)	**milk (kg)**	**meat (Mt)**	**milk (Mt)**
Developing	1980	14	34	47	114
	1990	18	38	73	152
	2002	28	44	137	222
	2015	*32*	*55*	*184*	*323*
	2030	*38*	*67*	*252*	*452*
	2050	*44*	*78*	*326*	*585*
Developed	1980	73	195	86	228
	1990	80	200	100	251
	2002	78	202	102	265
	2015	*83*	*203*	*112*	*273*
	2030	*89*	*209*	*121*	*284*
	2050	*94*	*216*	*126*	*295*

Source: Data for 1980–2015 adapted from Steinfeld et al. (2006) and for 2030–2050 from FAO (2006). Projections are shown in italic font (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2935116/

The diagram below depicts the potential products from cattle.

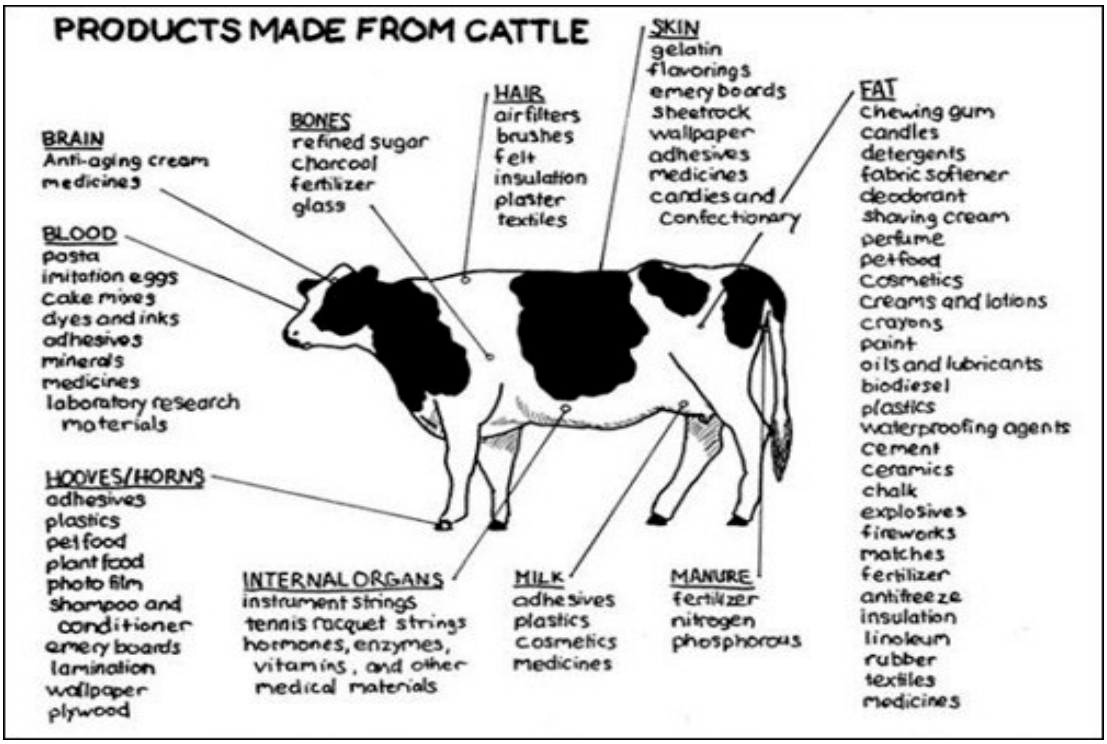


Figure 3.23: Potential products from cattle

Source: Data for 1980–2015 adapted from Steinfeld et al. (2006) and for 2030–2050 from FAO (2006). Projections are shown in italic font (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2935116/

The graph below shows cattle production per province for the period May 2008 to May 2018

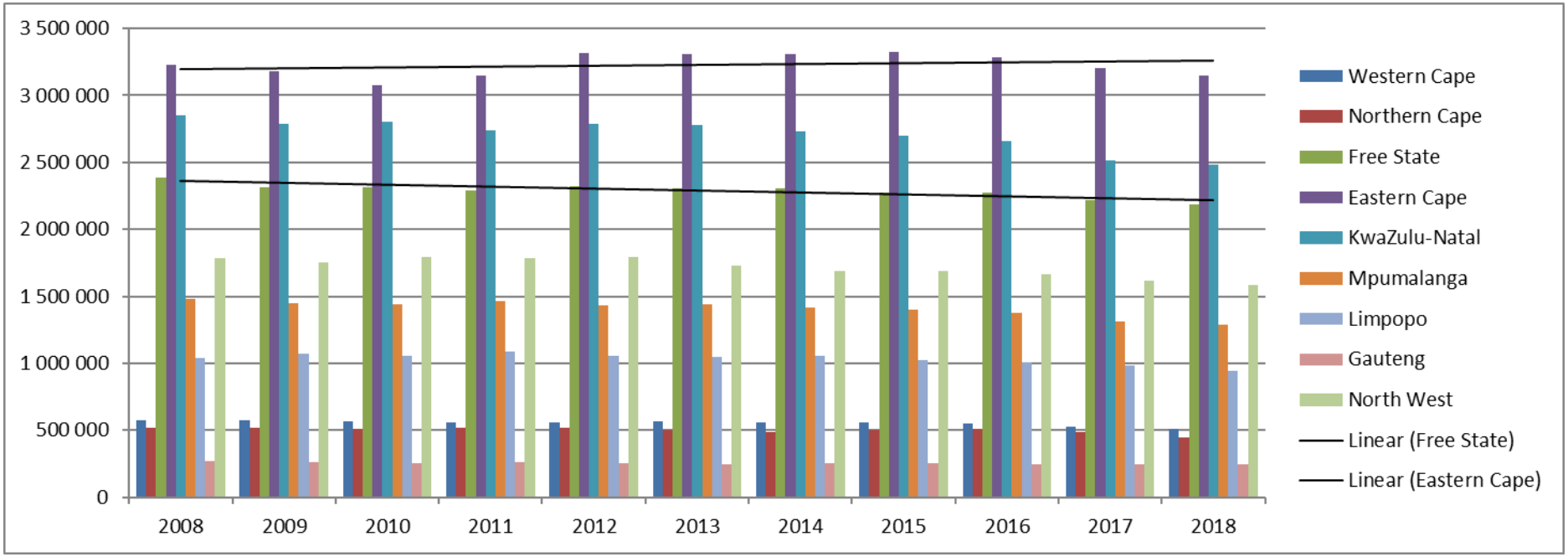


Figure 3.24: Cattle production per province till 2018

Author's own creation, 2018

It is evident from the graph that the herd size in all the provinces is declining. There may be many reasons for the decline, but the rainfall patterns and the drought are major issues. Another consequence of the drought is the price increase in cattle feed, if they are located in a feedlot.

The contribution of the Free State province averages around 17%. The pie chart below indicates the average contribution per province over the past 10 years.

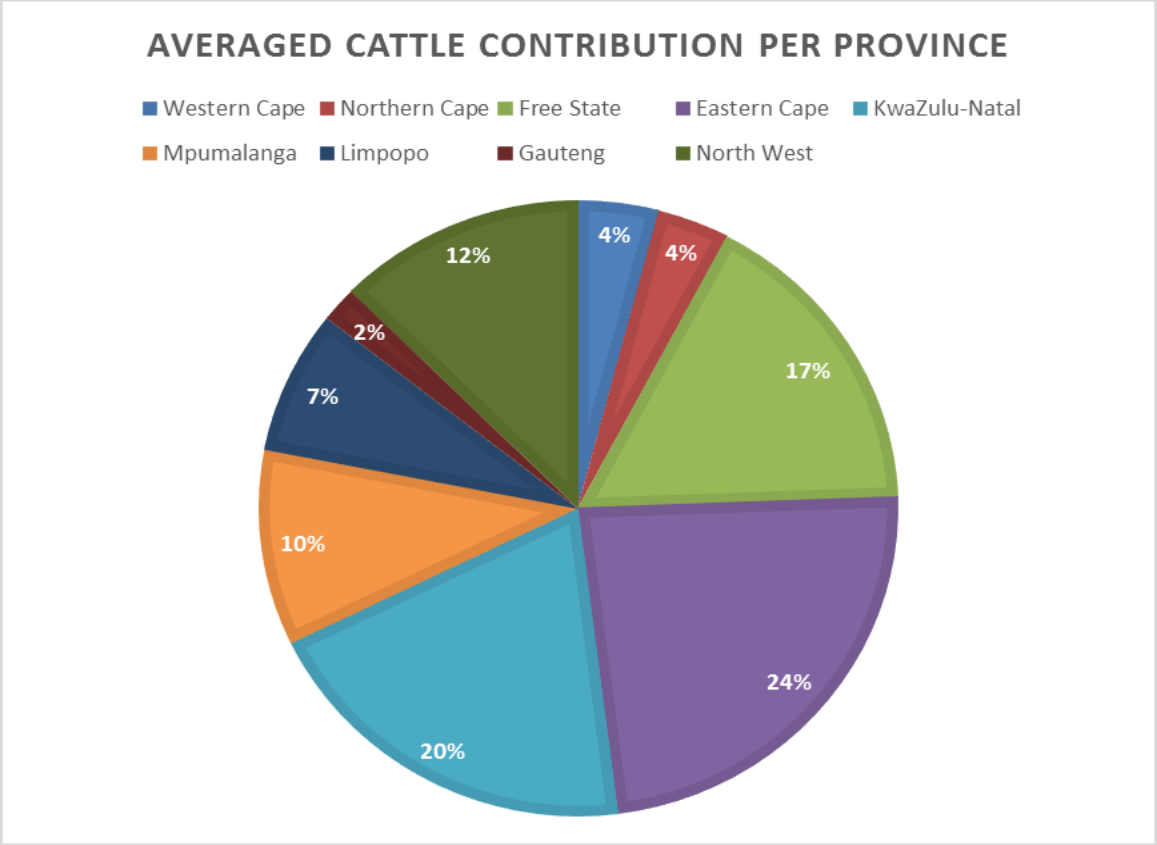


Figure 3.25: Average cattle contribution per province, 2017/18

Author's own creation, 2018

The table below provides more detail for the Free State province alone.

Table 3.11: Free State cattle contribution in South Africa

Year	Free State	% Contribution
01 05 2008	2 386 879	16,88%
01 05 2009	2 315 041	16,64%
01 05 2010	2 313 754	16,76%
01 05 2011	2 293 703	16,56%
01 05 2012	2 325 217	16,57%
01 05 2013	2 308 249	16,59%
01 05 2014	2 305 169	16,69%
01 05 2015	2 272 511	16,55%
01 05 2016	2 271 400	16,74%
01 05 2017	2 220 537	16,93%
01 05 2018	2 182 921	17,02%

Author's own creation, 2018

Although cattle numbers are busy declining in the Free State, there is still the potential to add value to slaughtered cattle products like hides. The processing of hides therefore seems to be a potential addition to agro-processing in the Free State as enough hides are available in the province. At this stage, the tannery in Wellington and the one in Middelburg in the Eastern Cape are buying around 60% of all hides from the Free State. However, many other smaller factories have closed down, not only in the Free State, but throughout South Africa. The main reasons for this were:

i. There are not enough skills in South Africa (highly technical process). There is also no training centre that can impart the highly technical skills to enthusiastic people in the hide industry. One reason why it is highly technical is the fact that when the mix of chemicals on a batch of hide is not 100% correct, the whole batch of hides needs to be dumped because the leather products will not have the expected lasting quality.

ii. It is very capital intensive. All the different machines and equipment are imported from Italy, are very sophisticated and with the Rand/Dollar exchange rate, very expensive.
iii. The minimum economical capacity for producing leather is 240 000 skins per annum.
iv. The leather tanning process requires lots of water. A tannery has to be erected next to a sustainable water source like the Orange or the Vaal River.
v. The quality of hides is important. This is a product mostly for the export market and the clothing and shoe industry is only interested in consistent and excellent quality.

Therefore the processing of hides into quality leather products does not seem to be feasible and viable at present. But this does not mean that further investigation is not possible. The strategic session to be held around the appropriateness of the different identified projects can be the determining factor.

Overview of sheep. The diagram below indicates potential products that can be made from sheep. Currently all products, except tripe, are in the hands of bigger private companies or co-ops, like the GWK's Senwes, etc.

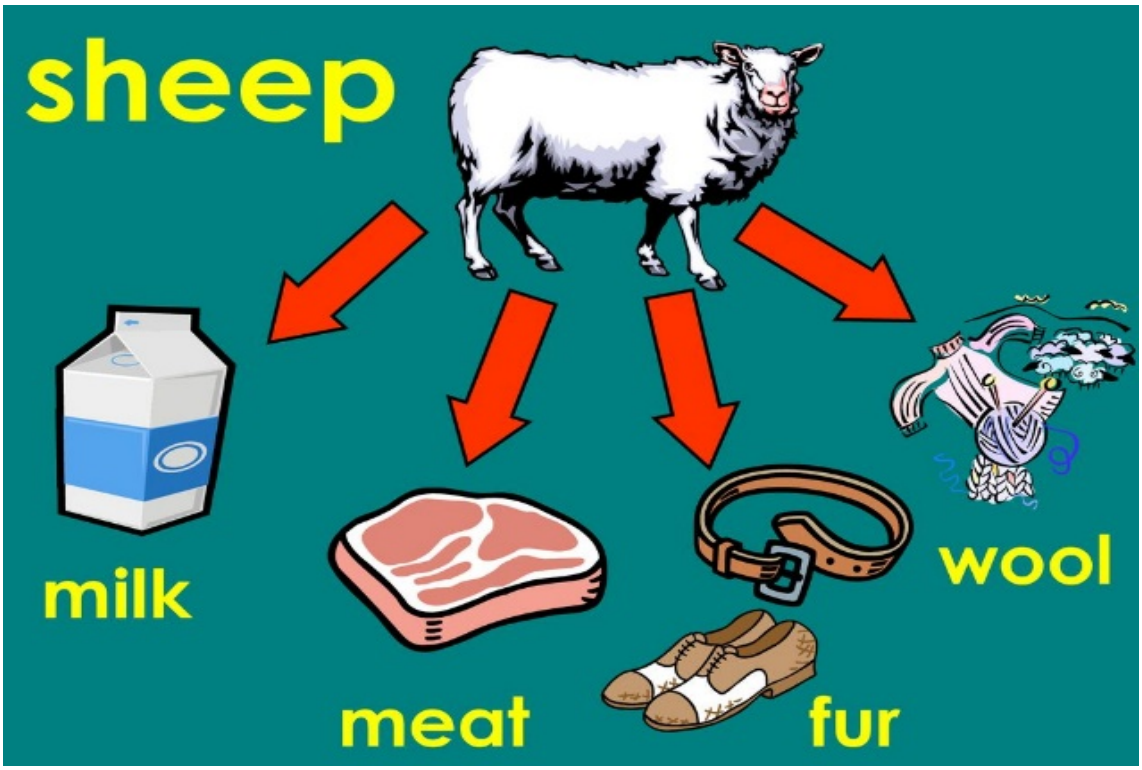


Figure 3.26: Products produced from sheep

The South African herd size has decreased steadily since 2008. This trend is evident in the graph below.

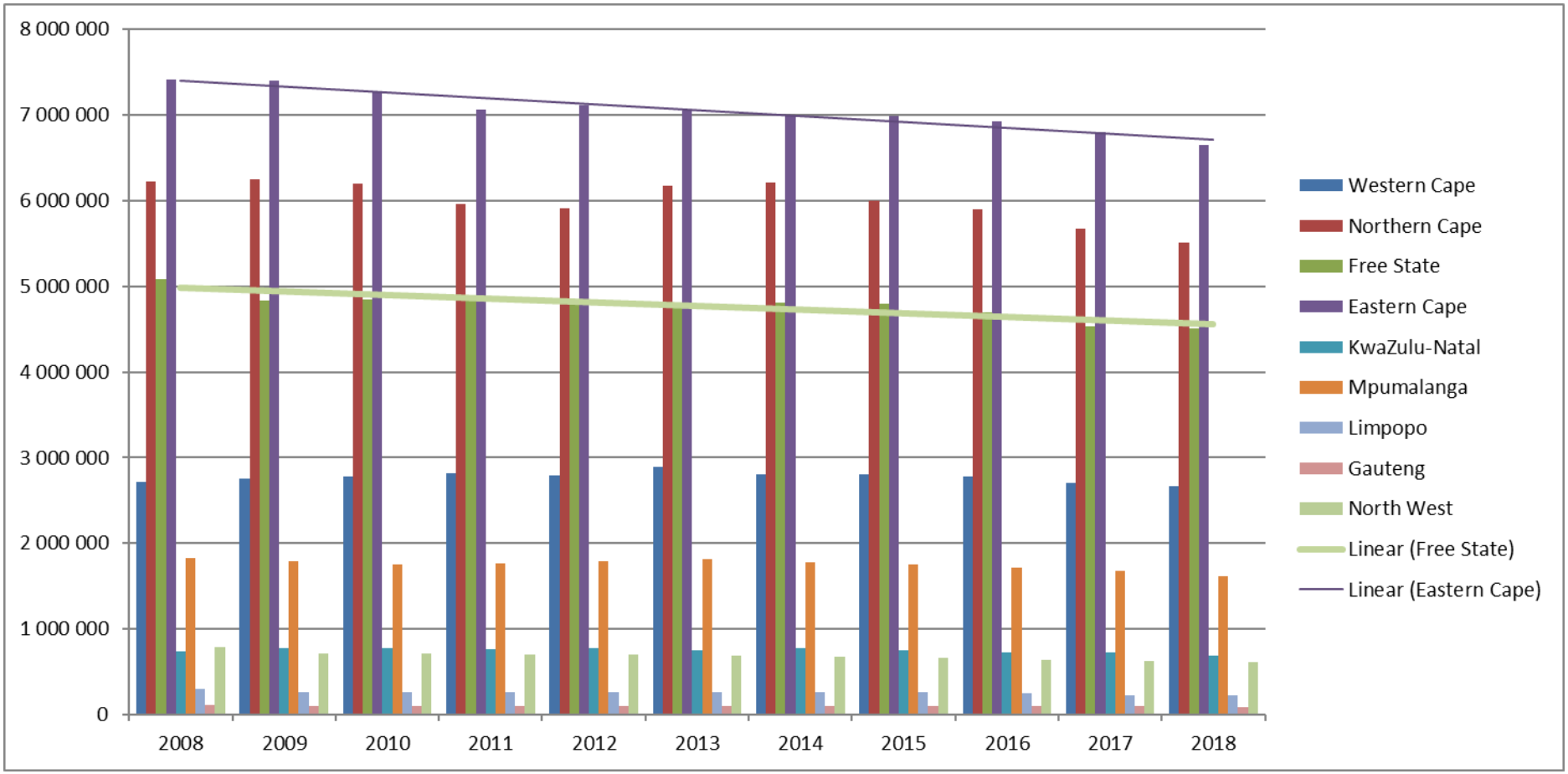


Figure 3.27: Sheep contribution per province in South Africa

Author's own creation, 2018

The pie chart indicates the average contribution per province since 2008. The Free State is currently third in terms of the number of sheep per province. See Figure 3.28.

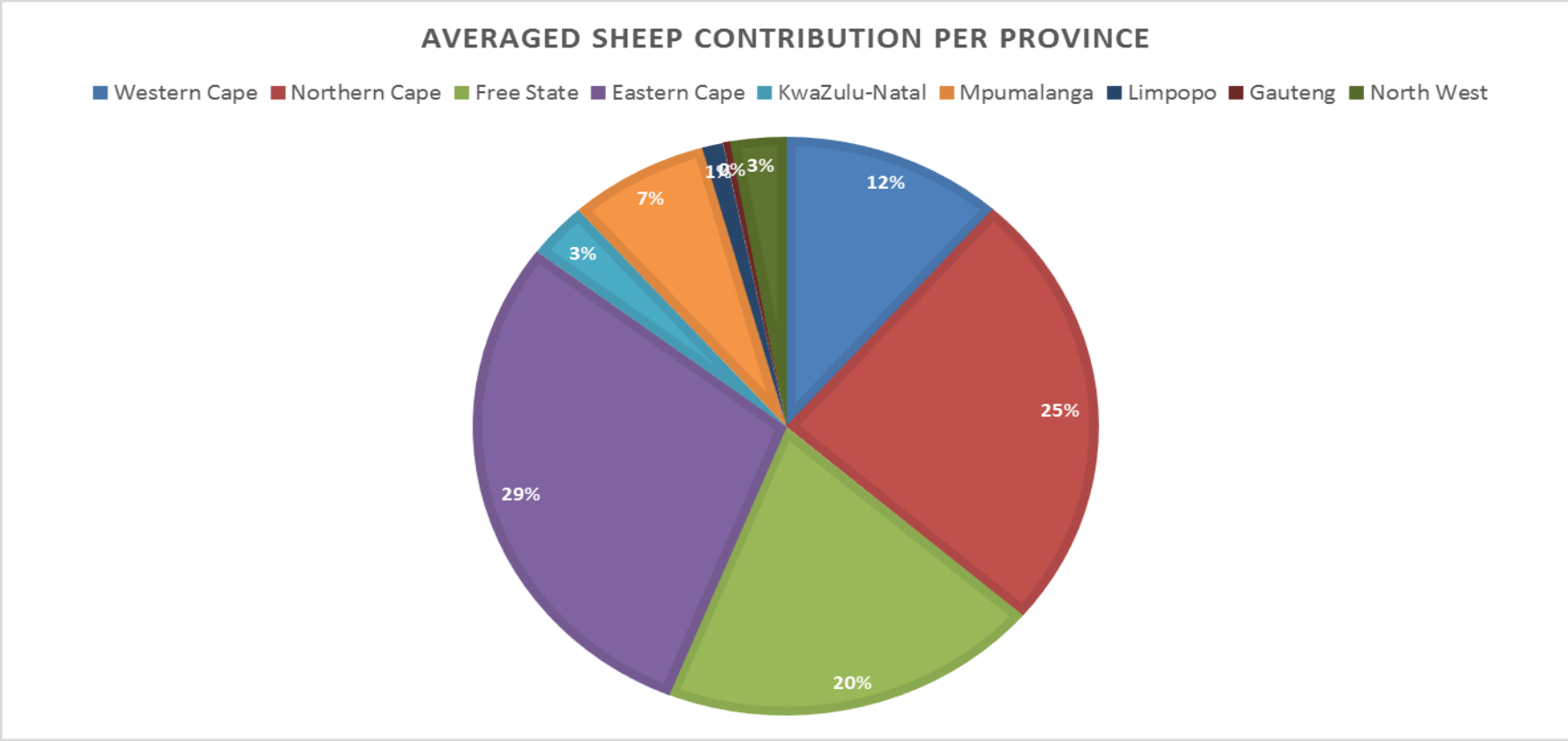


Figure 3.28: Current sheep contribution per province in South Africa

Author's own creation, 2018

Details for the Free State province are presented in the Table below.

Table 3. 12 Sheep numbers in the Free State, 2018

Year	Free State	% Contribution
01 05 2008	5 089 297	20,19%
01 05 2009	4 833 661	19,43%
01 05 2010	4 850 013	19,64%
01 05 2011	4 849 294	19,97%
01 05 2012	4 797 434	19,80%
01 05 2013	4 746 516	19,38%
01 05 2014	4 804 738	19,71%
01 05 2015	4 792 027	19,87%
01 05 2016	4 692 000	19,79%
01 05 2017	4 534 294	19,66%
01 05 2018	4 505 418	19,98%

Author's own creation, 2018

The decrease in the herd size of sheep is indicated in Figure 3.29 below.

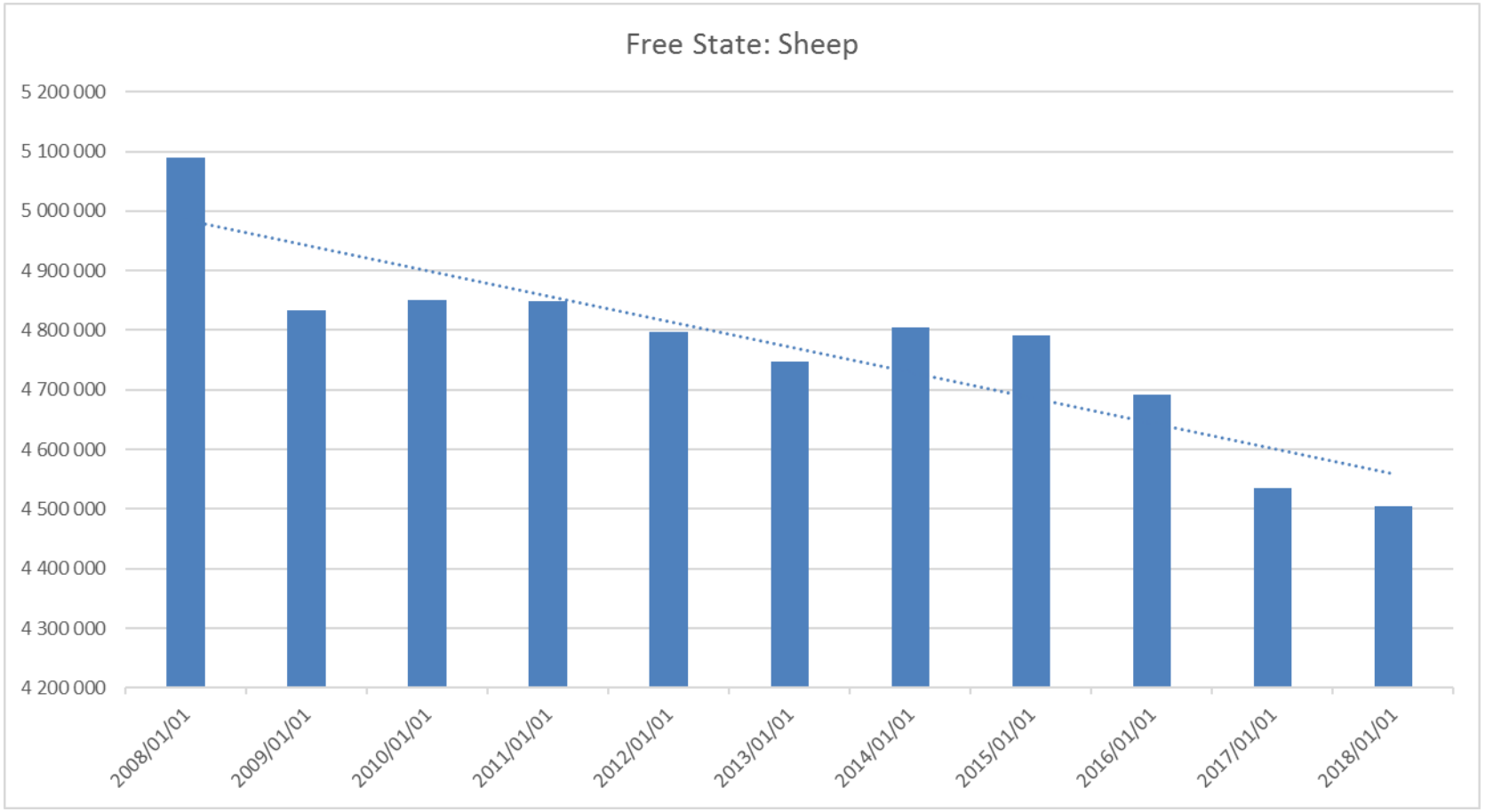


Figure 3.29: Declining numbers of sheep in the Free State province, 2018

Author's own creation, 2018

The most popular products from sheep are meat and wool. When referring to meat, often only the popular cuts are referred to (as depicted below).

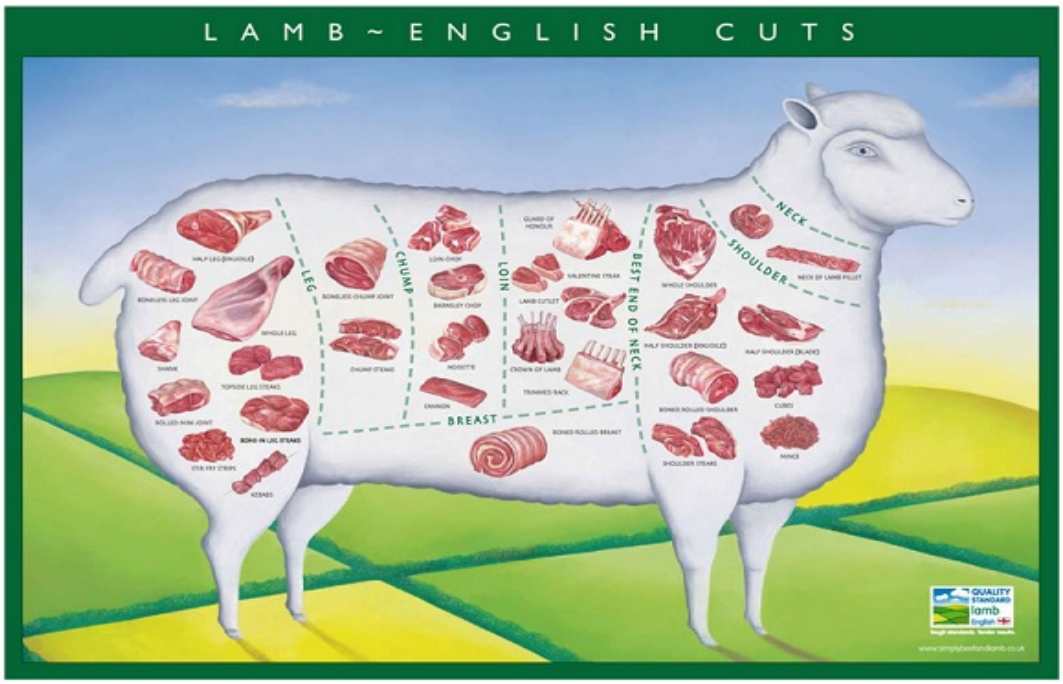


Figure 3.30: Variety of meat cuts from sheep

Source:
https://www.google.com/search?source=hp&ei=nAvzW7XbCMqIgAb95INo&q=different+cuts+of+meat+from+sheep&oq=different+cuts+from+sheep+&gs_l=psy-ab.1.0.0i22i30l2.7409.19062..22006...4.0..0.591.11039.2-8j13j5j4....2..0....1..gws-wiz.....0..0j0i131j33i22i29i30.c7_97sFJScA

The head and intestines,, known in South Africa as “afval” or tripe, are often forgotten. There is a huge untapped market when it is considered that one supplier sells 12 tons of afval every 2 weeks from a small Free State town. The average weight of the head and trotters is around 2.5kg. This is equal to approximately 2 400 heads per week. Per annum that would be 124 000 without additional marketing.

The statistics indicate that the Free State province has 4,5 million heads of sheep available. The sale of this “afval” from one supplier represents 2,5% of the “afval” available in the Free State. This needs to be investigated in much more detail to

ascertain the feasibility and viability of an" afval" processing plant to produce different kinds of the product for the diverse target markets. . .

Overview of pigs

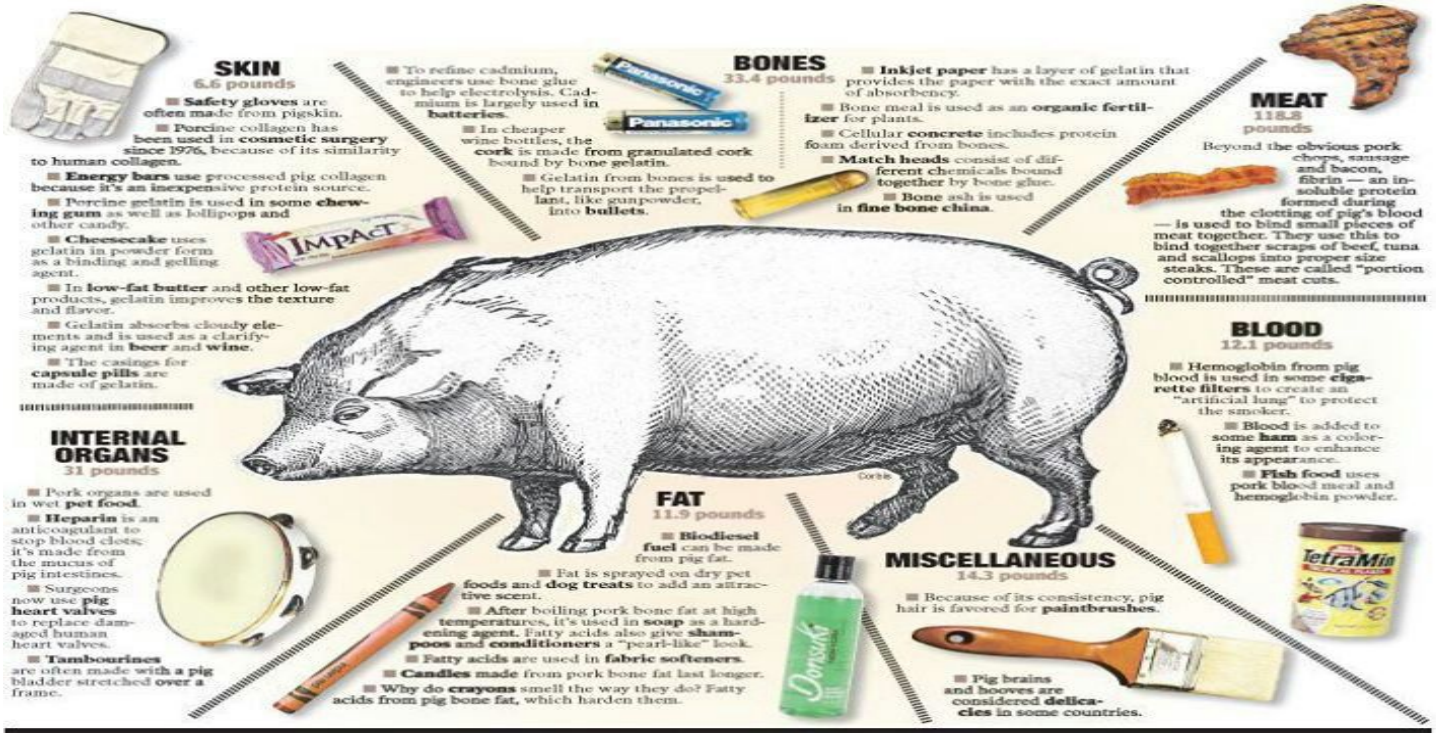


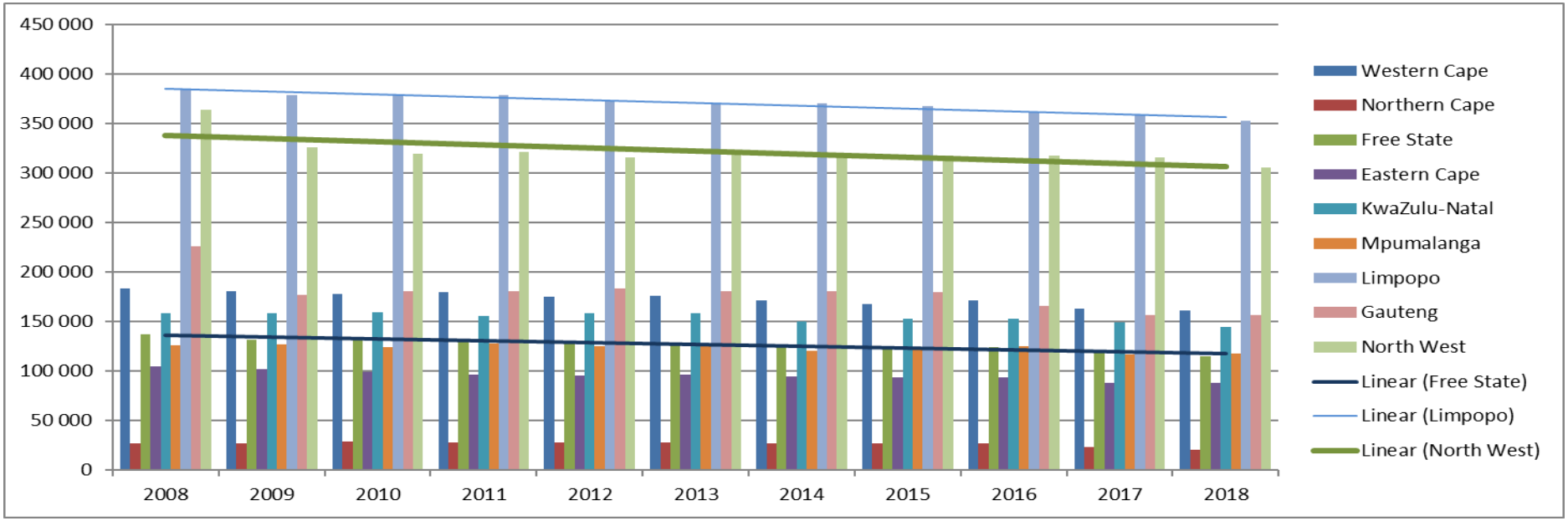
Figure 3.31: Different products from pigs

Source:

https://www.google.com/search?ei=sgvzW8yXOMzCgAbZja2gDA&q=different+cuts+of+meat+from+pigs&oq=different+cuts+of+me

at+from+pigs&gs_l=psy-ab.12..0i22i30.1845661.1848317..1850344...0.0..0.749.4331.4-4j3j1.....0....1..gws-wiz.....0i71j0i13i30.XFicILASARM

As with cattle and sheep, pig herd sizes have seen a steady decline since 2008, as indicated in the graph below.



.**Figure 3.32: Pig numbers per province till 2018**

Author's own creation, 2018

The contribution of the Free State to the pig stock over the 10-year period since 2008 is depicted in the pie chart (Figure 3.33) below

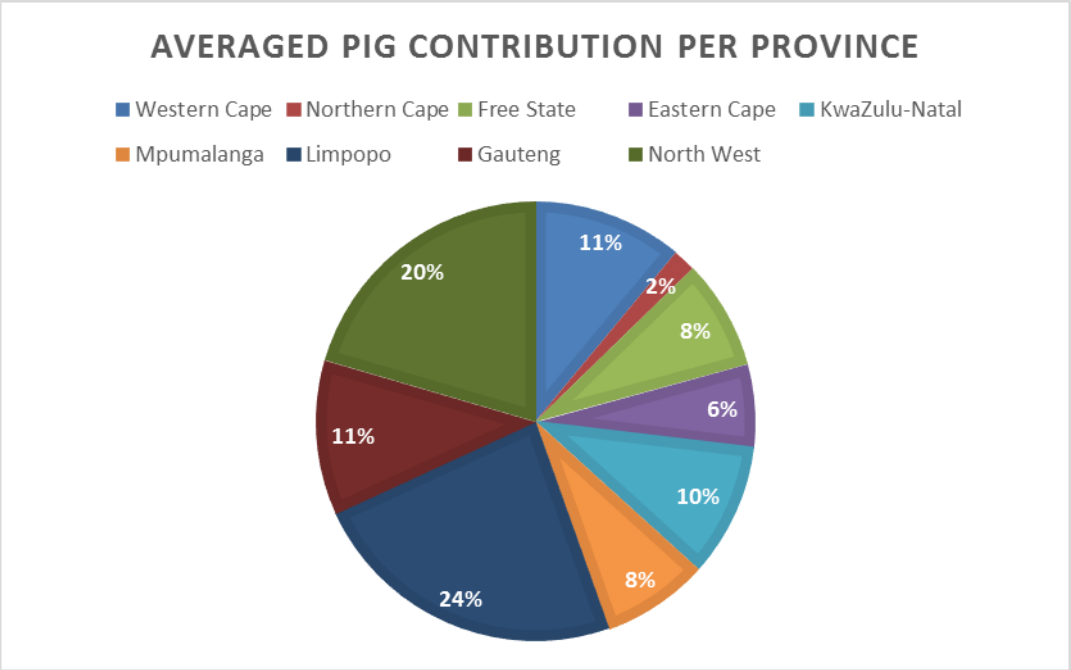


Figure 3.33: Current pig contribution per province, 2018

Author's own creation, 2018

The Table details the herd size of pigs since 2008.

Table 3. 13: Pig contribution in the Free State, 2018

Year	Free State	% Contribution
01 05 2008	137 059	8,00%
01 05 2009	131 959	8,20%
01 05 2010	133 121	8,31%
01 05 2011	129 491	8,10%
01 05 2012	128 431	8,11%
01 05 2013	127 826	8,09%
01 05 2014	125 074	8,02%
01 05 2015	124 265	8,01%
01 05 2016	124 370	8,08%
01 05 2017	118 806	7,97%
01 05 2018	114 774	7,85%

Author's own creation, 2018

The steady decline is highlighted in the figure below.

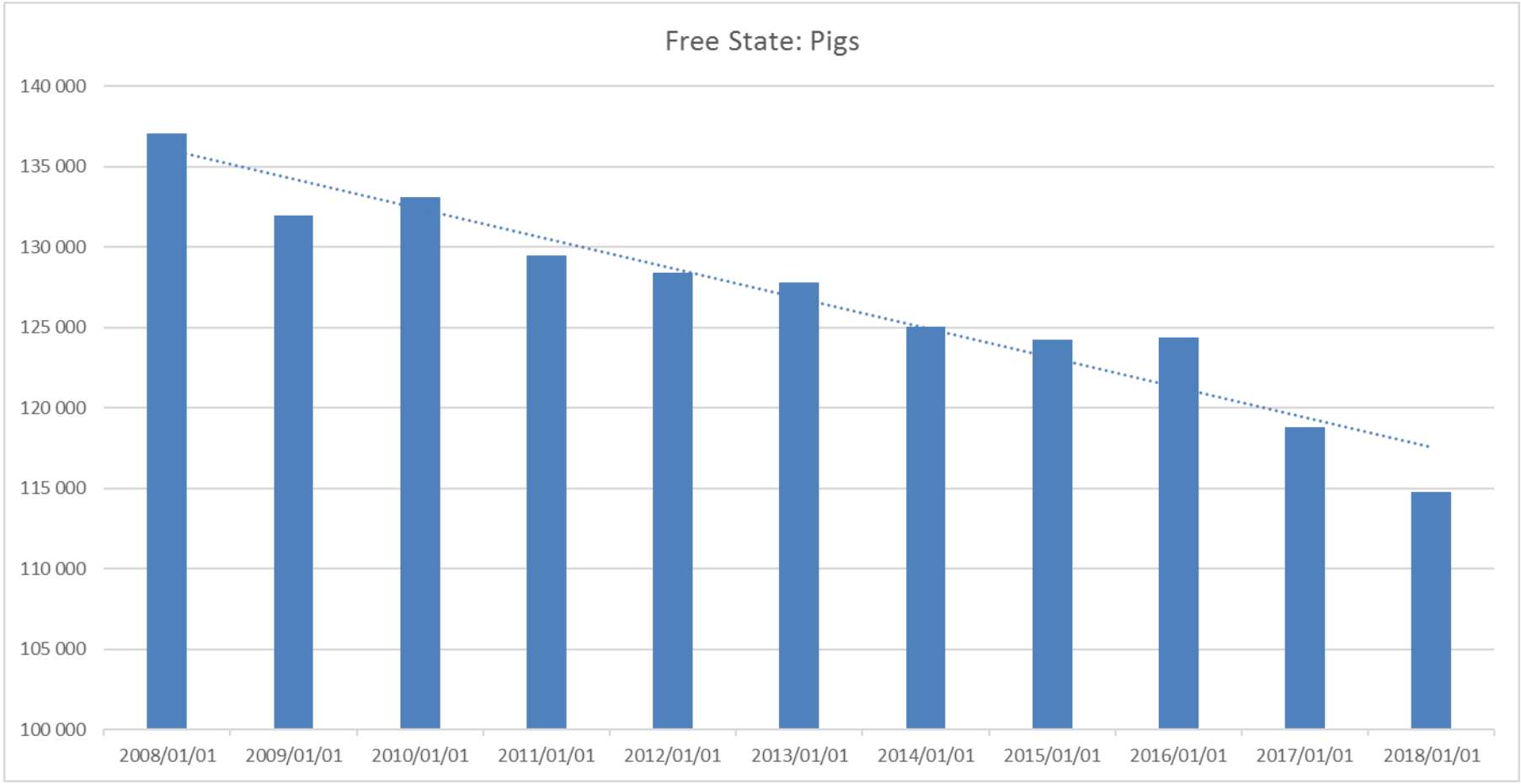


Figure 3.34: Declining numbers of pigs in the Free State

Author's own creation, 2018

As explained in the basic overview, there are many processing products from a pig. Much more research needs to be conducted on the possibility of processing one of these by-products. Pig is much more than just cuts of meat.

The following products are from a piggery business:

a. Different cuts of meat.
b. The use of pig dung in a biogas plant to generate electricity and, as renewable energy, puts that electricity back into the Eskom grid after approval from NERSA.
c. Pig abattoir to slaughter only pigs, because there is no abattoir in the Free State focusing only on the slaughter of pigs.

Figure 3.35: Products from pigs

Source:
https://www.google.com/search?ei=sgvzW8yXOMzCgAbZja2gDA&q=different+cuts+of+meat+from+pigs&oq=different+cuts+of+meat+from+pigs&gs_l=psy-ab.12..0i22i30.1845661.1848317..1850344...0.0..0.749.4331.4-4j3j1.....0....1..gws-wiz.....0i71j0i13i30.XFicILASARM

Overview of goats

1. The main products from goats are meat and milk and some secondary products are goat cheese and organic goat cheese, which have many uses and benefits.

For those who cannot tolerate cow's milk cheese products, goat's milk cheese may be a suitable swap. The protein structure found within goat cheese is different from other animal's milk, as the fat globules are smaller and easier to digest. A serving of cheese is considered to be one ounce, or about the size of three standard dice. Within this serving (or, ahem, two), you'll reap important nutrients including vitamins D and A along with certain B vitamins, calcium, phosphorus, zinc, potassium, and protein. Its fermented qualities ensure that cheese supports gut health while boosting the immune system too. In moderation, cheese is a perfectly acceptable food to enjoy with your favorite meals. Goat cheese has the following ingredients:

1 ounce:

102 calories

6 grams saturated fat

6 grams protein

8% DV vitamin A

11% DV vitamin B2

83 mg calcium

Source of iron, phosphorus, potassium, vitamin B12 and D.

Milk and milk by-products are very popular. The goat herd size in South Africa also shows a decrease. Again it may be due to the drought and the cost of feed.

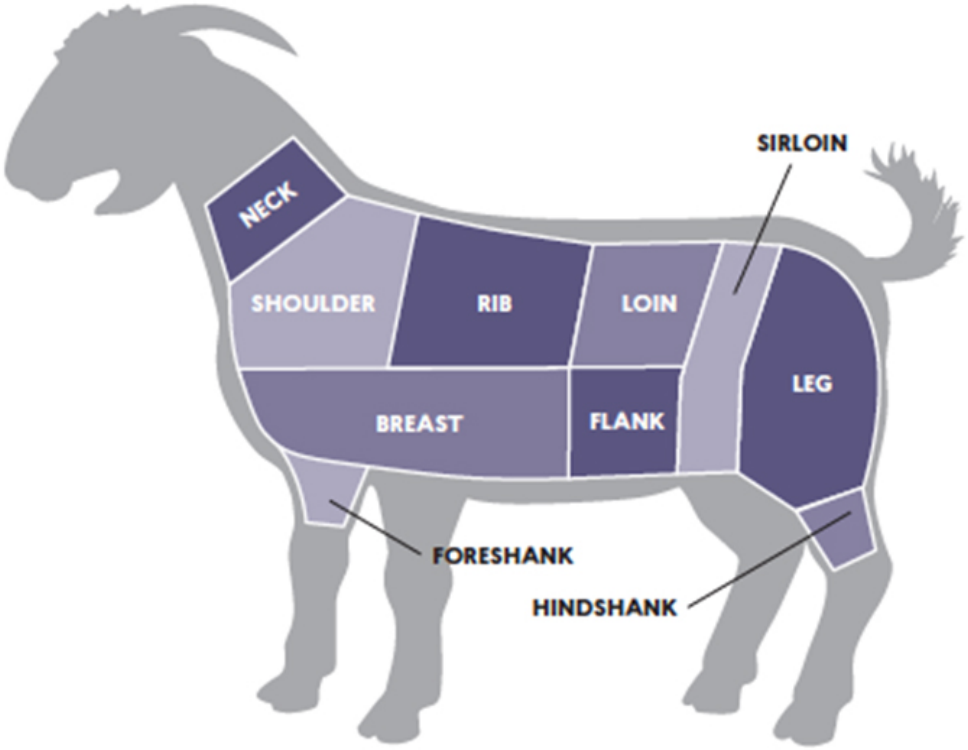


Figure 3.36: Products from goats

Source: https://www.organicauthority.com/energetic-health/cow-goat-feta-bluewhats-the-healthiest-cheese-a-nutritionist-explains

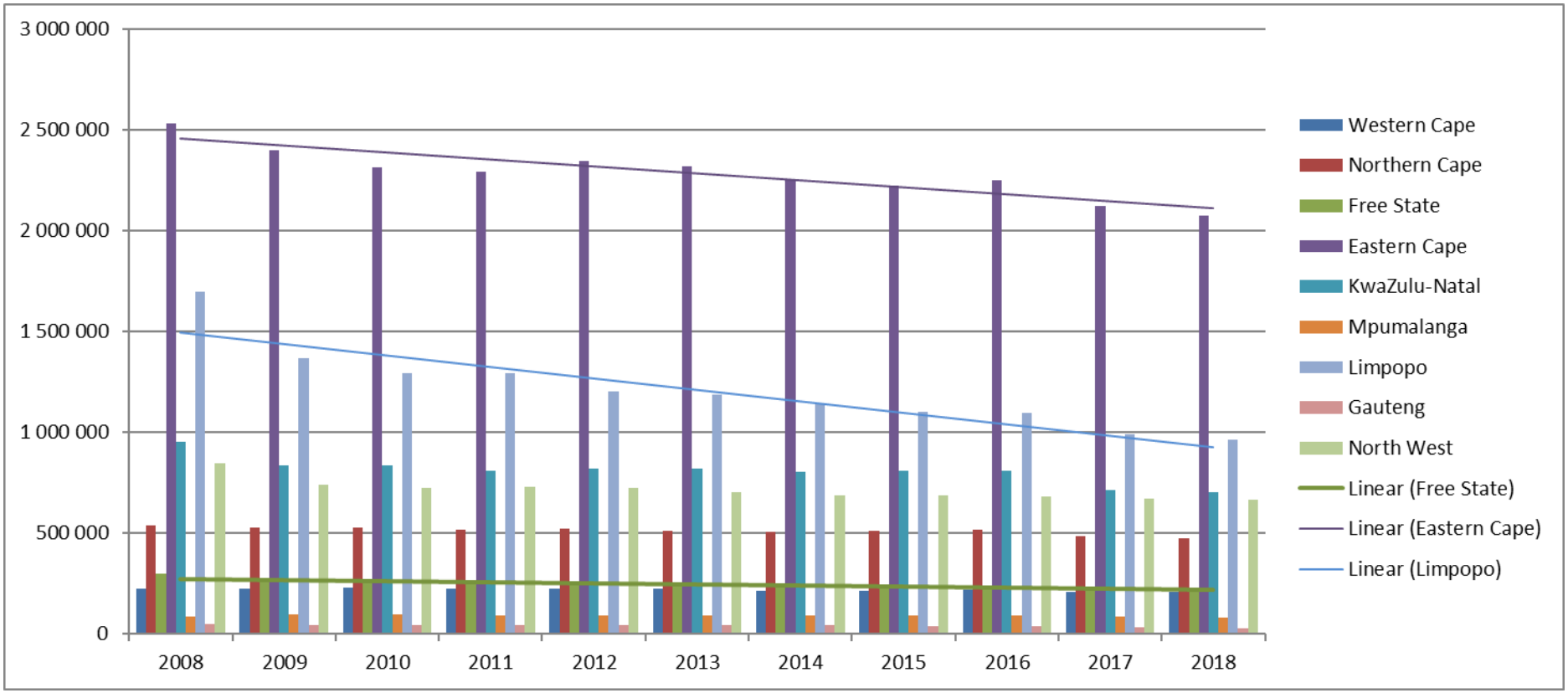


Figure 3.37: Goat numbers contribution per province, 2018

Author's own creation, 2018

The average contribution per province indicates that the Free State has a 4% share.

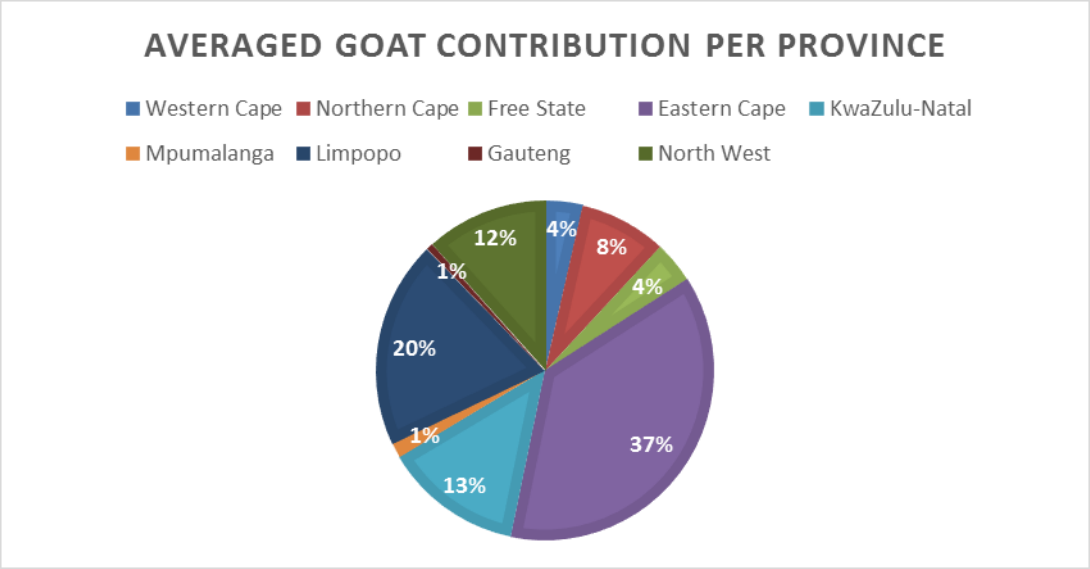


Figure 3.38: Goat contribution per province, 2018

Author's own creation, 2018

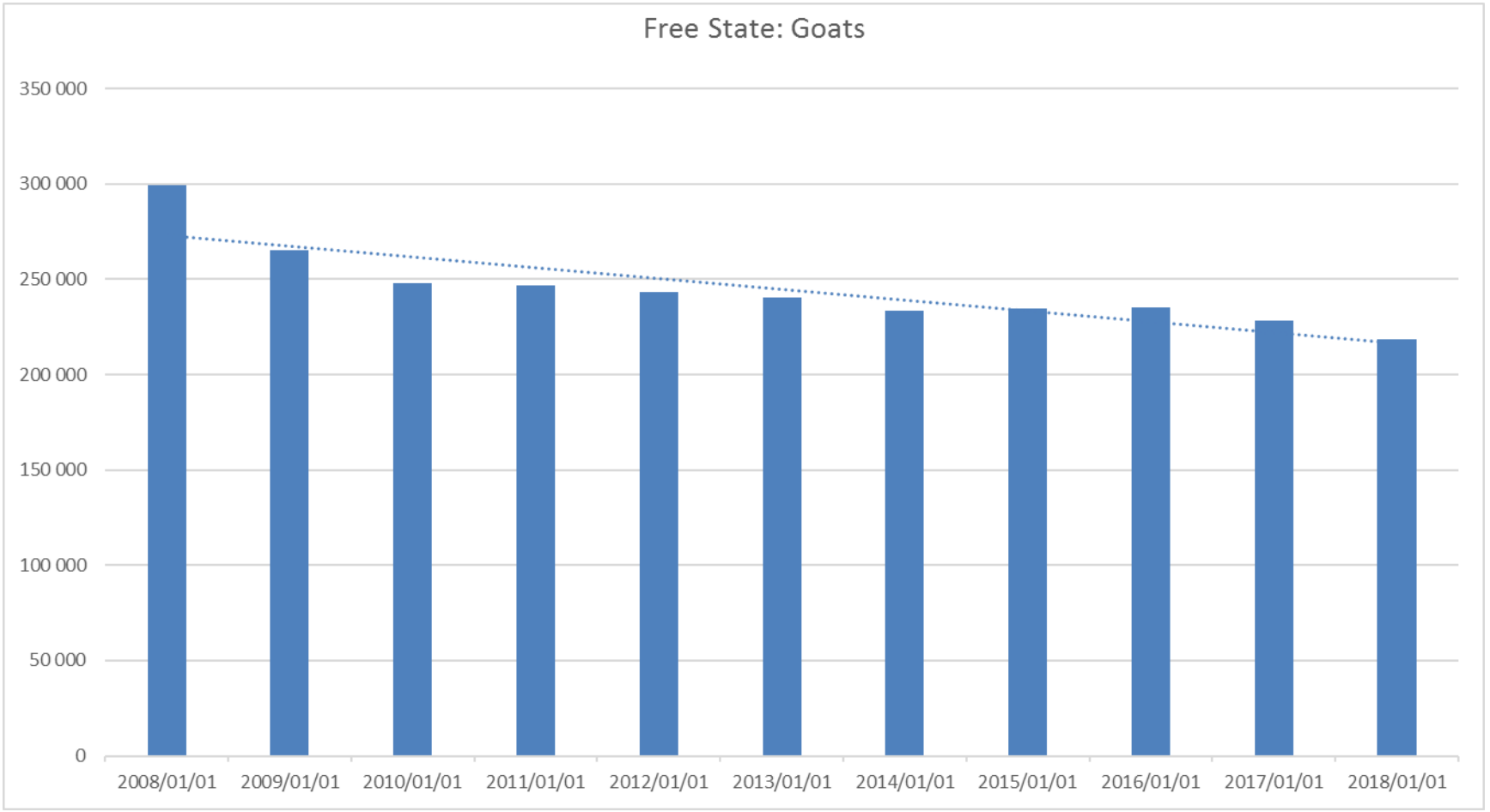
Table 3.14: Goat contribution in the Free State, 2018

Year	Free State	% Contribution
01 05 2008	299 262	4,15%
01 05 2009	265 159	4,08%
01 05 2010	248 097	3,94%
01 05 2011	246 820	3,95%
01 05 2012	243 241	3,92%
01 05 2013	240 251	3,92%
01 05 2014	233 306	3,90%
01 05 2015	234 858	3,97%
01 05 2016	235 050	3,96%
01 05 2017	228 548	4,13%
01 05 2018	218 430	4,03%

Author's own creation, 2018

There are parts of the southern Free State that are ideal for rearing goats for meat or fibre. This is also a product that needs more analysis.

Figure 3.39: Goat numbers in the Free State, 2018



Author's own creation, 2018

Review of fish production (*Aquaculture)*

The Xhariep Fish Factory was established in 2012 and is owned by the Xhariep Fish Farmers Association (40%), Management Company (40%) and Econofish/Government (20%). The company was established to beneficiate the fish harvest produced by fish farmers in the Free State province.. This is the initiative of the Department of Agriculture and Rural Development to fast-track food security, poverty alleviation, rural development and job creation.

The intention of the project was good, but feasibility and viability were not taken into consideration to make this a viable project. The millions of rand spent on the project in a few small towns in the Xhariep district have been wasted because the project is no longer functioning. See the following pictures taken at one of the fish plants.

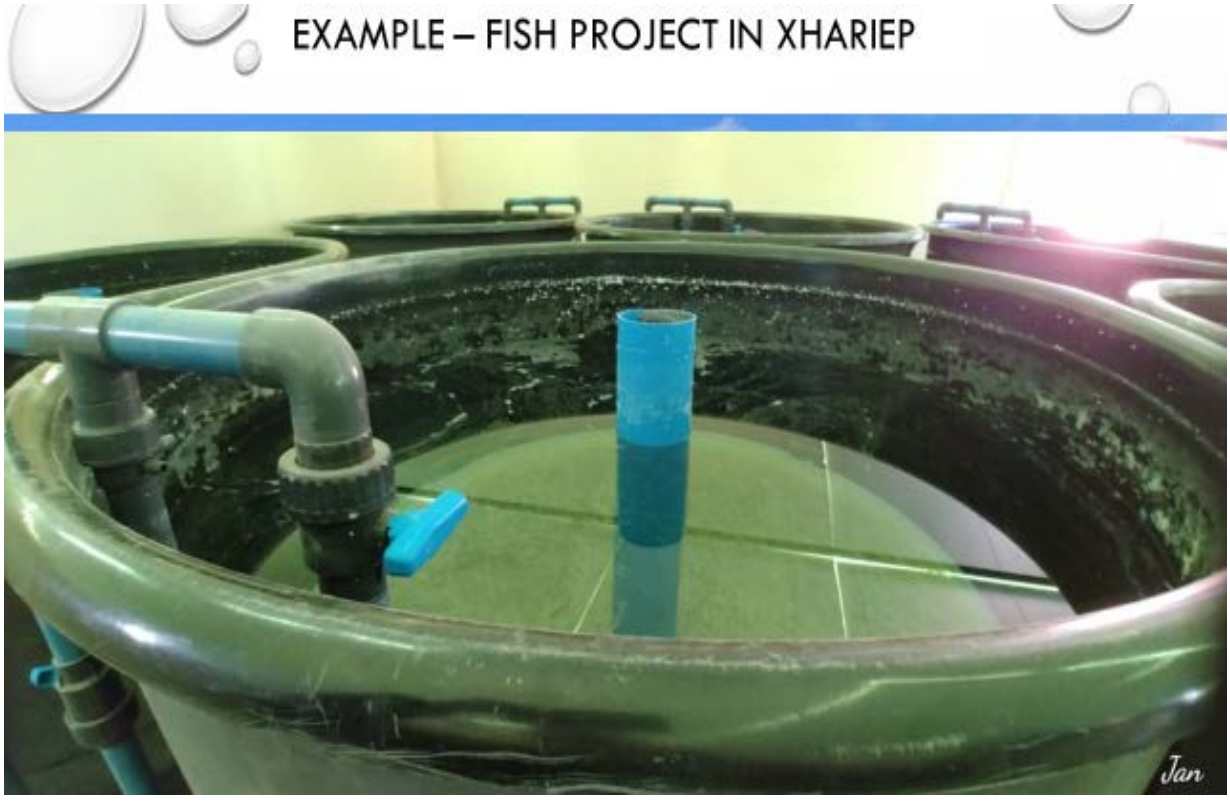


Figure 3.40: Example of the non-functioning fish project in the Xhariep district

It is important to reinvestigate the fish project infrastructure for the profitable and feasible production of fish for new target markets. A strategic session can re-evaluate the project for feasibility and viability.

3.4 Value adding in the agricultural sector

In business, the difference between the sale price and the production cost of a product is the unit profit. In economics, the sum of the unit profit, the unit depreciation cost, and the unit labour cost is the unit value added. Summing value added per unit over all units sold is total value added. Total value added is equivalent to revenue less intermediate consumption. Value added is a higher portion of revenue for integrated companies, e.g., manufacturing companies, and a lower portion of revenue for less integrated companies, e.g., retail companies. Total value added is very closely approximated by compensation of employees plus earnings before taxes. The first component is a return to labour and the second component is a return to capital. In national accounts used in macroeconomics, it refers to the contribution of the factors of production, i.e., capital (e.g., land and capital goods) and labour, to raising the value of a product and corresponds to the incomes received by the owners of these factors. The national value added is shared between capital and labour (as the factors of production), and this sharing gives rise to issues of distribution (https://en.wikipedia.org/wiki/Value_adde).

Outside of economics, value added refers to "extra" feature(s) of an item of interest (product, service, person etc.) that go beyond the standard expectations and provide something "more", even if the cost is higher to the client or purchaser. Value-added features give competitive edges to companies with otherwise more expensive products.

Value-added methods and measurements are also being utilised in the agricultural sector as part of a national movement towards agro-processing. Figure 3.41 indicates the five product levels and is applicable to most products, also in the agricultural industry.

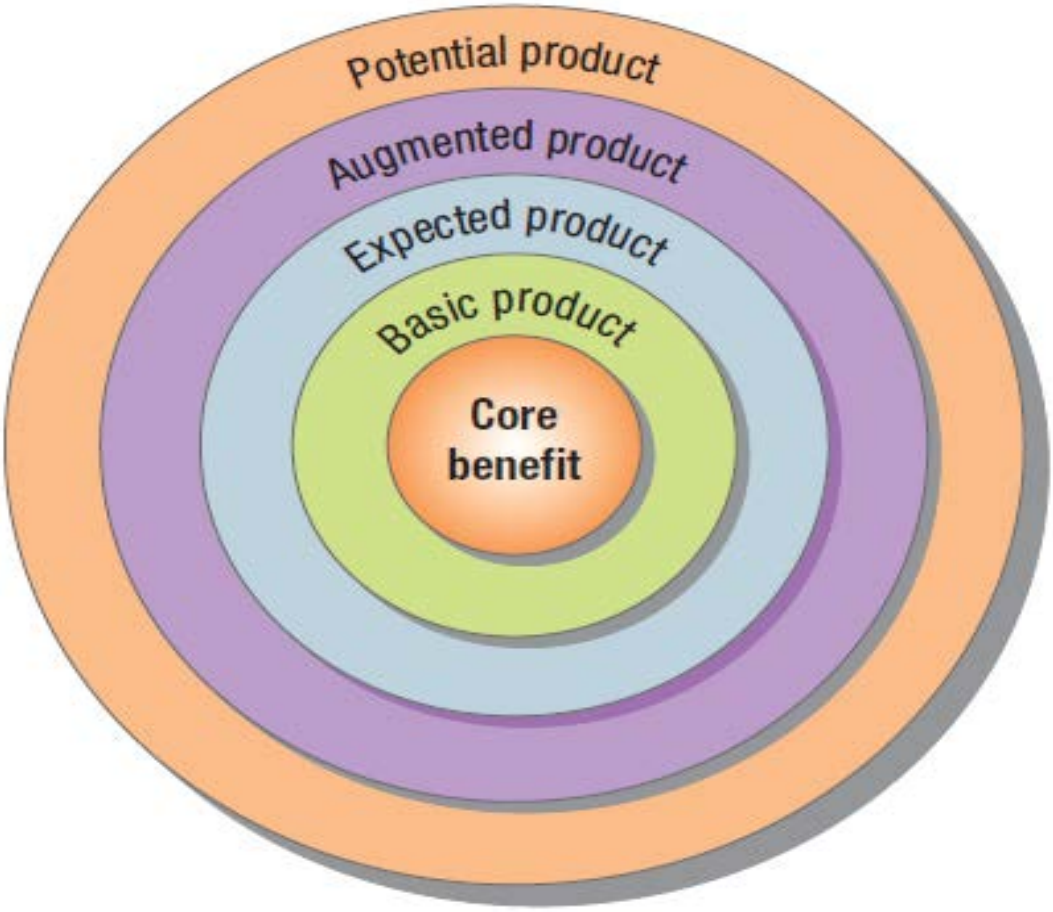


Figure 3.41: The five product levels of a product

Source: Author's own creation

According to Philip Kotler, who is an economist and a marketing guru, a product is more than a tangible *'thing'*. A product meets the needs of a consumer and in addition to a tangible value this product also has an abstract value. For this reason it states that there are five product levels that can be identified and developed. In order to shape this abstract value, it uses five product levels in which a product is located or seen from the perception of the consumer. These 5 Product Levels indicate the value that consumers attach to a product. The customer will only be satisfied when the specified value is identical or higher than the expected value (Kotler, 2016).

1. Core product

This is the basic product and the focus is on the purpose for which the product is intended. For example, wheat and wheat flour is used for eating or baking to counter hunger; or fruit for eating healthier food. The more important benefits the product provides, the more customers need the product. A key element is the uniqueness of the core product. This will benefit the product positioning within a market and affect the possible competition.

2. Generic product

This represents all the qualities of the product. For wheat, it needs to have a specific protein content for use in baking the right quality bread, it needs to be graded, have a specific moisture content, etc.

3. Expected product

This is about all aspects the consumer expects to get when they purchase a product. Wheat flour should be really tasty, have the right quality, be graded and packed in the right size for purchase.

4. Augmented product

The augmented product refers to all additional factors which set the product apart from that of the competition. In particular this involves brand identity, its image, etc. But also factors like service, warranty and good value for money play a major role. The goal is to deliver something that is beyond an expected product. Itis the translation of the desire that is converted into reality.

5. Potential product

This is about augmentations and transformations that the product may undergo in the future. For example, can wheat flour change in future to bake instant bread in 5 minutes without going through all the milling processes?

Figure 3.42 gives an idea of the different levels of wheat as described above.

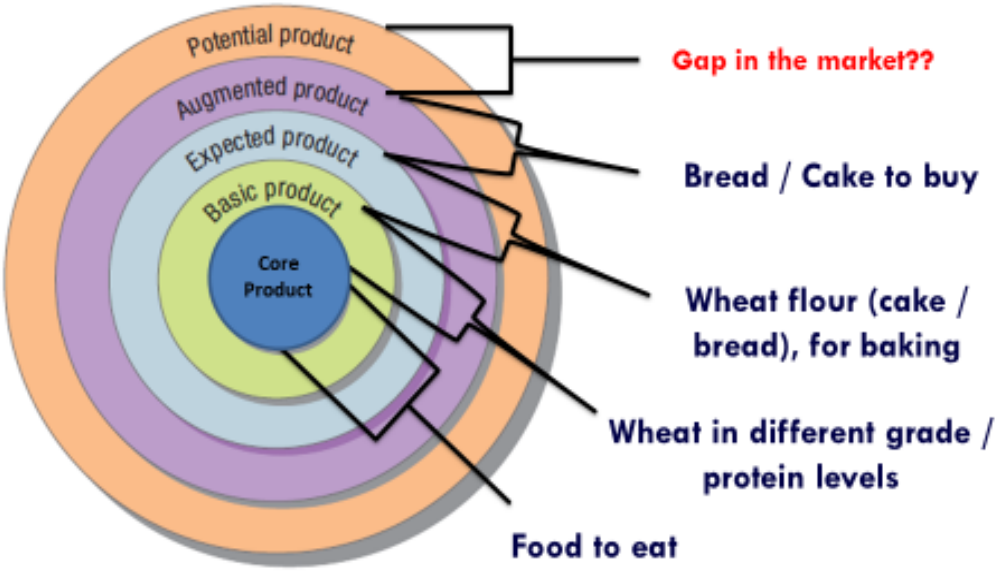


Figure 3.42: The five product levels of wheat as agro-processing product

3.4.1 Value adding: Wheat

When looking at wheat, value adding is done up to the augmented stage (level 4) of the five product levels. Analysing the wheat industry in detail, the overall situation for South Africa is as follows:

- There is a decline in the hectares planted.
- With new cultivars giving a higher yield, the production figures increased a little over time.
- In the Free State in particular there was a decline in wheat hectares planted as well as in the production thereof (see figure 3.43).

As already discussed in the previous paragraph, there was a decline in wheat production and all major co-ops have already added value by milling and baking. But there may be one opportunity left – durum wheat. **South Africa** mainly produces bread **wheat**; **durum wheat** represents a very small percentage of the annual **wheat production** in the country. **Wheat** is produced in 32 of **South Africa's** 36 **crop**

production regions. Except for the irrigation areas in the Free State, Mpumalanga (irrigation) and North West (mainly irrigation) are other important **wheat-producing** provinces (https://www.google.com/search?ei=EFz0W8_9OMS2kwWzu4mwCA&q=durum+wheat+production+in+South+Africa&oq=durum+wheat+production+in+South+Africa&gs_l=psy-ab).

Semolina, durum granular, and durum flour milled from durum wheat are used to manufacture paste and non-paste food products. Paste products are manufactured by mixing water with semolina or durum flour to form unleavened dough, which is formed into different shapes and either cooked and eaten or dried for later consumption. Pasta and couscous are paste products. Products of durum wheat in a high moisture leavened or unleavened bread and cooked or steamed bulgur (cracked durum wheat) and frekeh (parched immature wheat kernel) are non-paste food products (https://www.ag.ndsu.edu/plantsciences/research/durum/products).

GWK (Cooperative) built a pasta factory as well as a cookie plant at Modder River just five kilometers from the Free State border in the Northern Cape. The plant is relatively new (two years in production) and its sustainability has not yet been proven.

Taking field crops into perspective, wheat, white and yellow maize, sorghum, groundnuts and dry beans – there is not really any other value adding potential except the aspects already mentioned. The only field crop worth exploring is sunflower, which will be taken into perspective at the strategic session. .

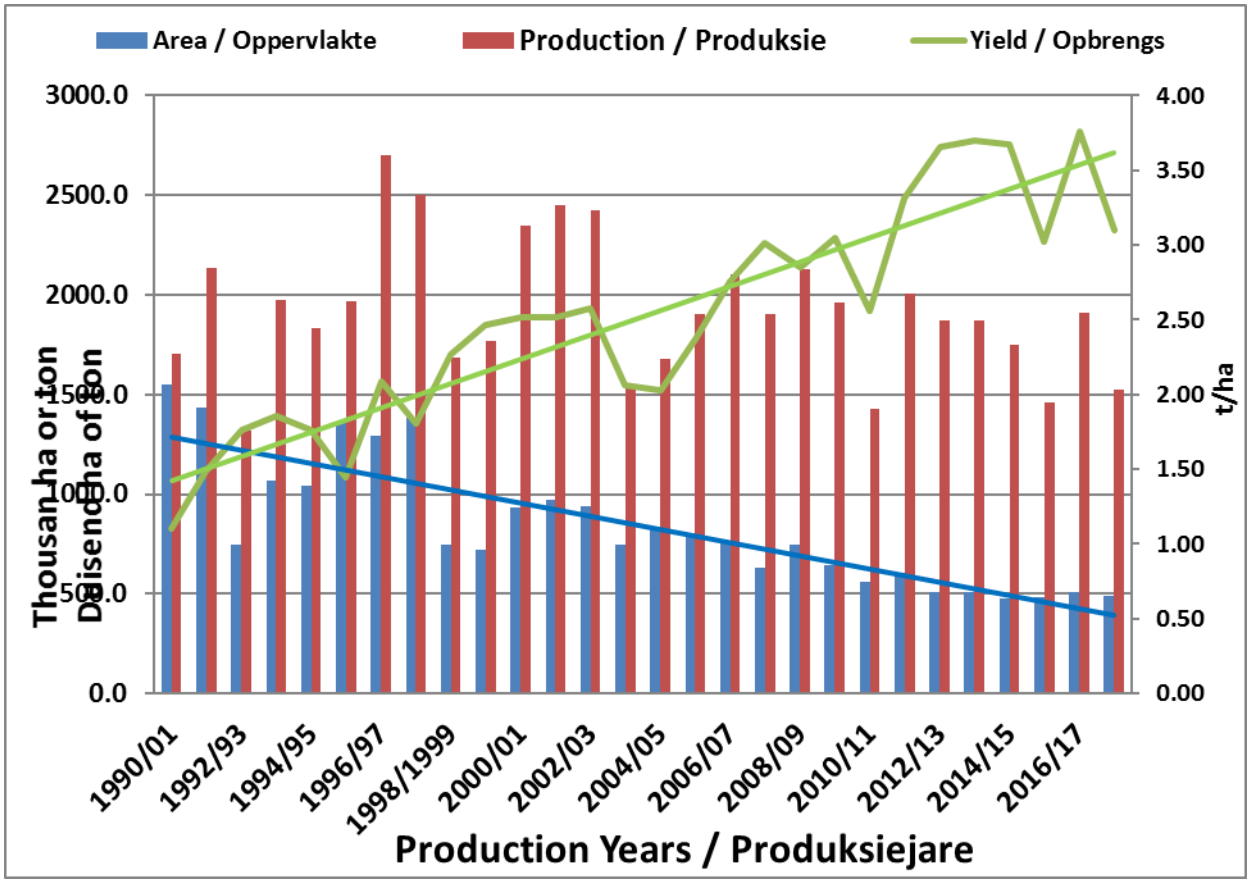


Figure 3.43: Wheat area planted and production figures from 1990 to 2017

Source: Author's own creation

3.4.2 Value adding: Teff

Teff (*Eragrostis teff*) as a raw material for malting, brewing and manufacturing of gluten-free foods and beverages

The demand for gluten-free foods is certainly increasing. Interest in teff has increased noticeably due to its very attractive nutritional profile and gluten-free nature of the grain, making it a suitable substitute for wheat and other cereals in their food applications as well as foods for people with celiac disease. The main objective of this article is to review researches on teff, evaluate its suitability for different food applications, and give direction for further research on its applications for the health food market. Teff is a tropical low risk cereal that grows in a wider ecology and can tolerate harsh environmental conditions where most other cereals are less viable. It has an excellent balance of amino acid composition (including all 8 essential amino acids for humans) making it an excellent material for malting and brewing. Because

of its small size, teff is made into whole-grain flour (bran and germ included), resulting in a very high fibre content and high nutrient content in general. Teff is useful to improve the haemoglobin level in human body and helps to prevent malaria, incidence of anaemia and diabetes. The nutrient composition of teff grain indicates that it has a good potential to be used in foods and beverages worldwide. The high levels of simple sugars and α-amino acids as a result of breakdown of starch and protein, respectively, are essential for fermentation and beer making.

3.5 What is the BCG (Boston Consulting Group) Matrix?

The Boston Consulting Group's product portfolio matrix (BCG Matrix) is designed to help with long-term strategic planning, to help a business or any other institution to consider growth opportunities by reviewing its portfolio of products to decide where to invest, to discontinue or develop products. It is also known as the Growth. The matrix will now be used to identify the optimum product portfolio of the Free State. Existing as well as new agricultural products will be ranked in the matrix according to the products' potential to add value or not.

The matrix is divided into 4 quadrants based on an analysis of market growth and relative market share, as shown in the diagram below.

Figure 3.44 (a): The Boston Consulting Matrix

Source: Hanlon, 2018

The following is a description of each of the different quadrants:

- **1. Dogs:** These are products with low growth or low market share. It means that the potential for agro-processing is not good enough to invest in them.

- **2. Question marks or problem child:** Products in high growth markets with low market share. In the agro-processing case these are new products that can be produced in the Free State and added value to via agro-processing.

- **3. Stars:** Products in high growth markets with high market share. These are products that the Free State province can also invest in to add value to them.

- **4. Cash cows:** Products in low growth markets with high market share. These are products that still generate profit but adding value to them is not always the best option.

Free State province / investors / farmers / manufacturers can use the Boston Matrix for strategic planning as well as growth opportunities. Here is the proposed Boston Matrix for the Free State Province to ensure growth as well as more job opportunities.

When exploring the Boston Matrix in Figure 3.44 (b), the idea is to look at the question mark quadrant. This is where the new potential products for agro-processing lie. All the mentioned products in this quadrant will either be discussed in more detail or will be analysed in the workshop to be held because describing them in detail in the report will make it too lengthy.

Stars (?) Potatoes Onions Carrots Beetroot Sweet potatoes Cucumber Butternut Angora (Fibre)	**Question marks (New farmers)** New and Nice Prickly pears Teff Tripe/Afval Pomegranates PX/Alfalfa Juice Fish
Cash cows (Established farmers) Maize Wheat Sunflower Soya Cattle Sheep Pigs Goats (Meat)	**Dogs** Sorghum (reposition) Peas Gem squash Pumpkin Cabbage Grapes and Wine

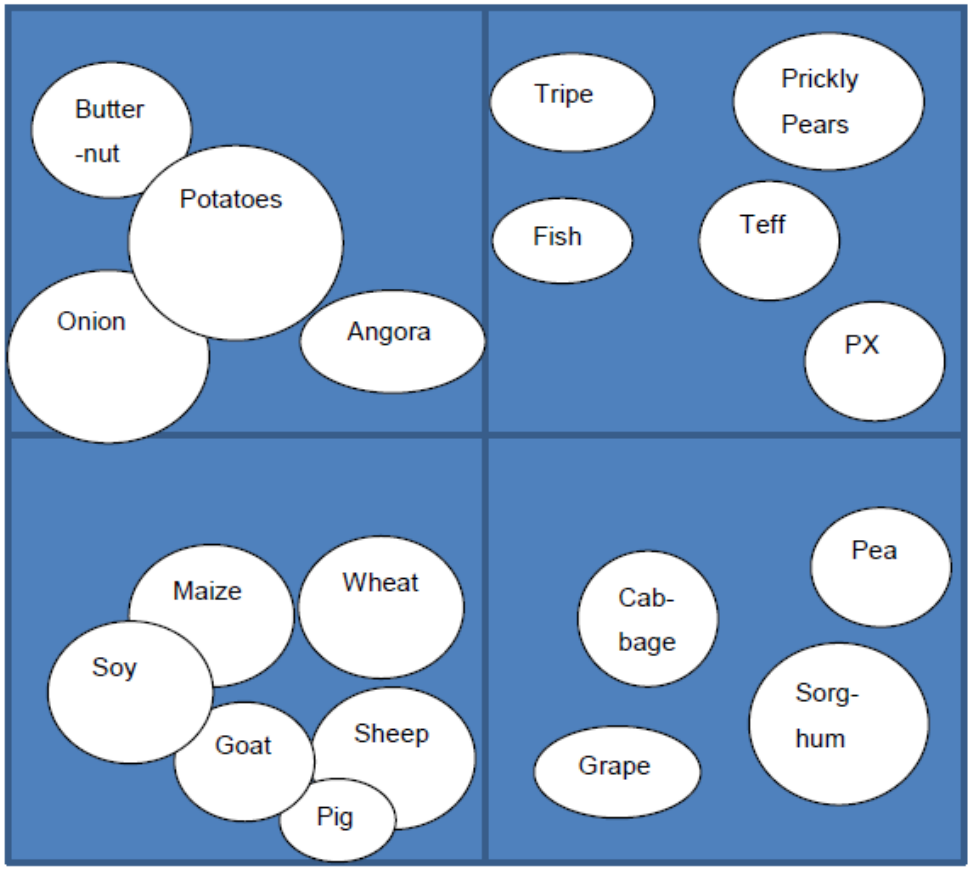


Figure 3.44 (b): Application of the Boston Consulting Matrix for products and potential products in the Free State, 2018

Source: Authors own creation

3.5. Role-players in agro-processing in the Free State

Because the Free State is the food basket of South Africa, there are many bigger role-players specifically in products like maize, wheat, sunflower, sorghum etc. Table 3.1 gives an indication of the grain products produced in the Free State.

Table 3.15: Free State field crop production contribution to South Africa

Wheat	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Total SA	1870	1750	1457	1910	1525
Free State	270	246	184	306	328
% of total	14.4	14.1	12.6	16.0	21.5
Soybeans	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Total SA	960 000	1 045 000	1 089 000	742 000	1 430 000
Free State	373 000	337 000	407 000	281 000	517 500
% of total	38.9	32.2	37.4	37.9	36.2
Sunflower	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Total SA	809 000	834 500	755 000	874 600	792 300
Free State	413 500	437 900	440 000	478 500	452 300
% of total	51.1	49.6	58.3	54.7	57.1
Groundnuts	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Total SA	74 500	62 300	17 680	92 050	68 400
Free State	23 500	21 800	2 980	34 100	26 400
% of total	31.5	35.0	16.9	37.0	38.6
Sorghum	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Total SA	265 000	129 500	70 560	152 000	83 070
Free State	139 200	45 000	24 150	24 640	18 270
% of total	52.5	34.7	34.2	16.2	22.0
Maize white	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Total SA	7710	4736	3409	9893	6702
Free State	3760	2237	1191	5112	3446
% of total	48.8	47.2	34.9	51.7	51.4
Maize yellow	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**
Total SA	6540	5220	4370	6551	6208
Free State	2488	1709	1023	2219	2071
% of total	38.0	32.7	23.4	33.9	33.4

Source: Author's own creation

The reason for showing Table 3.15 as a summary again is to bring it into relation to the major role-players in the field crop industry. The next Table gives an indication of the major role-players in the industry and the tonnage they handle or use in agro-processing products.

Table 3.16: Major players in the field crop industry.

Wheat	**2017/18**
VKB	70 000
OVK	55 000
SENWES	65 000
SUIDWES	10 000
Pioneer Foods	25 000
GWK	8 500
ITAU	85 000
OTHER	328 000
Total	328 000

Maize white and yellow	**White**	**Yellow**	**Total**
	2017/18	**2017/18**	**2017/18**
VKB	150 000	30 000	180 000
OVK	265 000	120 000	385 000
SENWES	270 000	55 000	325 000
SUIDWES	225 000	75 000	300 000
GWK	255 000	85 000	340 000
ITAU	380 000	165 000	545 000
OTHER	850 000	450 000	1 300 000
Total	2 395 000	980 000	3 375 000

Soybeans	**2017/18**
VKB	130 000
OVK	85 000
SENWES	65 000
SUIDWES	0
GWK	55 000
ITAU	25 000
OTHER	157 500
Total	517 500

Sorghum	2017/18
VKB	65 000
OVK	85 000
SENWES	105 00
SUIDWES	0
GWK	55 000
ITAU	35 000
OTHER	547 200
Total	787 200

Groundnuts	2017/18
VKB	0
OVK	0
SENWES	7 600
SUIDWES	0
GWK	5 200
ITAU	0
OTHER	13 600
Total	26 400

Sunflower	2017/18
VKB	165 000
OVK	235 000
SENWES	120 000
SUIDWES	0
GWK	15 000
ITAU	0
OTHER	66 500
Total	601 500

Source: Author's own creation

Other, represents the smaller players' handling of processing the mentioned products. Although co-ops are all BEE companies, the majority shareholders are white farmers. The other role-players are also the majority white entrepreneurs or farmers processing some of the mentioned products. As already stated, there is not really a gap in the market to get new black farmers or black entrepreneurs into the field crop industry. The only way is to let black farmers or entrepreneurs link up with existing willing farmers or entrepreneurs.

3.6 Livestock

Livestock production in South Africa contributes substantially to food security. It is also a topic of public debate because of a lack of knowledge and wrong information. This part of the study aims to provide information on the worth and impact of the livestock sector; value adding in this sector as well as information and statistics providing a baseline to guiding sustainability towards the next five years.

Seventy per cent of agricultural land in South Africa can be utilised only by livestock and game and species are found in all provinces with high concentrations in the eastern higher rainfall regions. Statistics in 2018 indicate 12.8 million cattle, of which just less than a million is dairy cattle, 22.5 million sheep, 5.4 million goats, 3 million game species (farmed), 1.4 million pigs, 115 million broilers, 32.5 million layers and 1.3 million ostriches. The gross value of livestock products increased by 185% from 2006/2010 and by 193% from 2011/2018. In relation to field crops and horticulture, livestock products increased their position from 42% to 47% of gross agricultural value. The main reason was a rise in the value and demand for livestock foods, particularly meat. Livestock foods contribute 27% of the consumer food basket on a weight basis. Consumption of livestock foods resembles that of developing countries with meat consumption being 50 - 90 g/capita/day, milk and dairy products 120 - 130 g /capita/day and eggs 15 - 20 g/capita/day (Meissner, et al, 2018).

Livestock numbers (sheep, cattle, goats and pigs) declined from 2006 to 2018 in the Free State. Figure 3.45 indicates that sheep declined the most (22.06%), followed by goats (15,31%), then pigs (13.96%) and cattle the least with just over 4%. One of the main reasons for the impact on livestock is theft in the Free State. Theft is more severe than reflected by official statistics, according to a recent study conducted by the University of the Free State (UFS) (Lombard and Van Niekerk, 2013). The research showed that over a three-year period (2011 to

2013), livestock to the value of about R247 million were lost to theft (stolen and not recovered) each year on average.

Official statistics over the same period show that 19 772 sheep were lost to theft in the Free State each year, but the UFS study found this figure to be 329% higher – 84 995 sheep. There was a 48% difference in official cattle statistics and study numbers, at 6 490 and 9 622 lost respectively. The pattern was repeated for goats: official statistics put the numbers lost at 827, while the study found the figure to be 1155, a 40% difference.

Each one of the mentioned livestock has also a value chain where value adding can take place. See Figure 3.45 for the blueprint value chain.

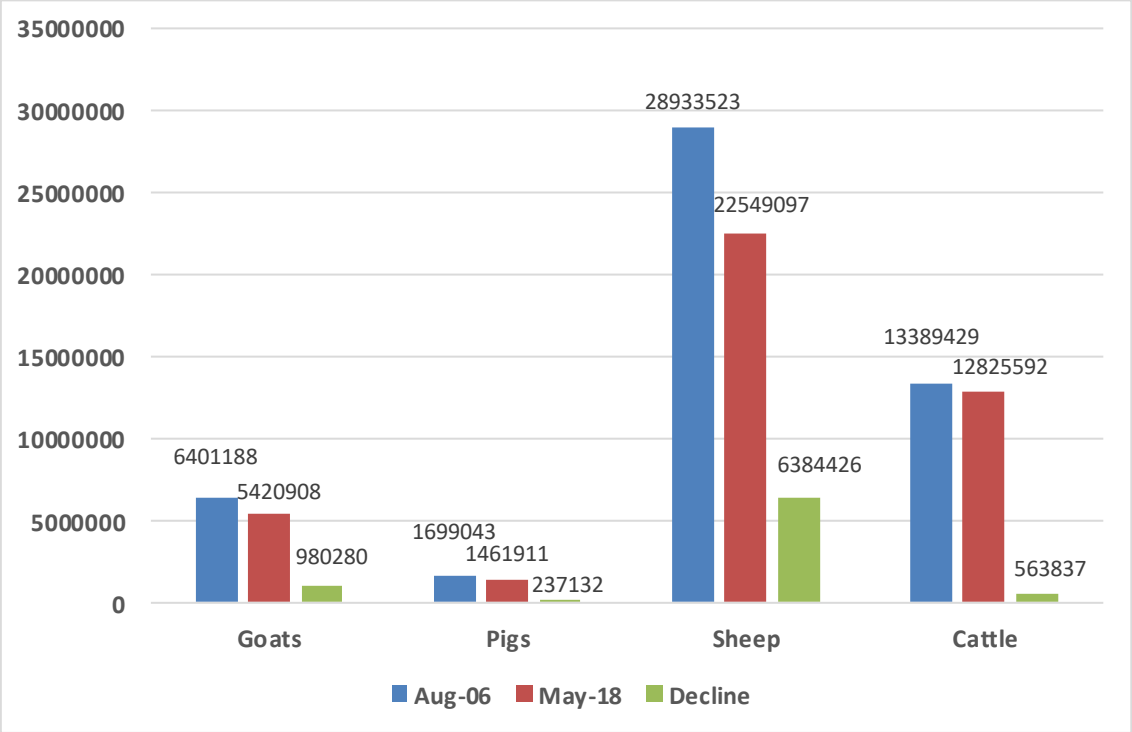


Figure 3.45: Summary of livestock and decline figure, South Africa.

Source: Author's own creation

Table 3.17: Employment per hectare, 2016

1. Field crops		2. Animal products		5. Fruits	
Maize	0.01	Poultry	0.0222	Citrus	1.00
Wheat	0.01	Eggs	0.0400	Grapes	1.62
Barley	0.01	Dairy	0.0286	Apples	1.25
Soya beans	0.01	Beef	0.0143	Pears	1.26
Sunflower	0.01	Pork	0.0185	Plums	1.46
		Sheep	0.0083	Prunes	1.46
				Peaches	1.20
				Nectarines	1.25
				Avocados	2.00
3. Vegetables		4. Nuts		Mangos	1.40
Potatoes	0.80	Pecan nuts	1.30	Litchis	1.40
Tomatoes	3.50	Macadamias	0.80	Bananas	2.00
Onions	0.98			Guava	1.50
Carrots	3.00			Pawpaw	2.00
Pumpkins	2.10			Strawberries	2.30
Green mealies	1.00			Cherries	3.00

Source: Bureau of Food and Agriculture Policy (BFAP) 2016

According to Table 3.17 not many job opportunities are created. The products that really generate more job opportunities are also the products in the question mark quadrant of the Boston Consulting Matrix. A further discussion will follow now on some examples of the value-adding process of some of the mentioned products.

Looking at the value-adding blueprint, in any of the six legs of the blueprint either farmers or entrepreneurs can come in as a business or as a farmer or both. The blueprint is thus a very good way of identifying gaps in doing business, or farm with new products or do processing to add value. For example, an entrepreneur can come in as a leaf supplier for the new thorn less prickly pears, or another entrepreneur can start producing flour from the dried leaves of the prickly pear. .

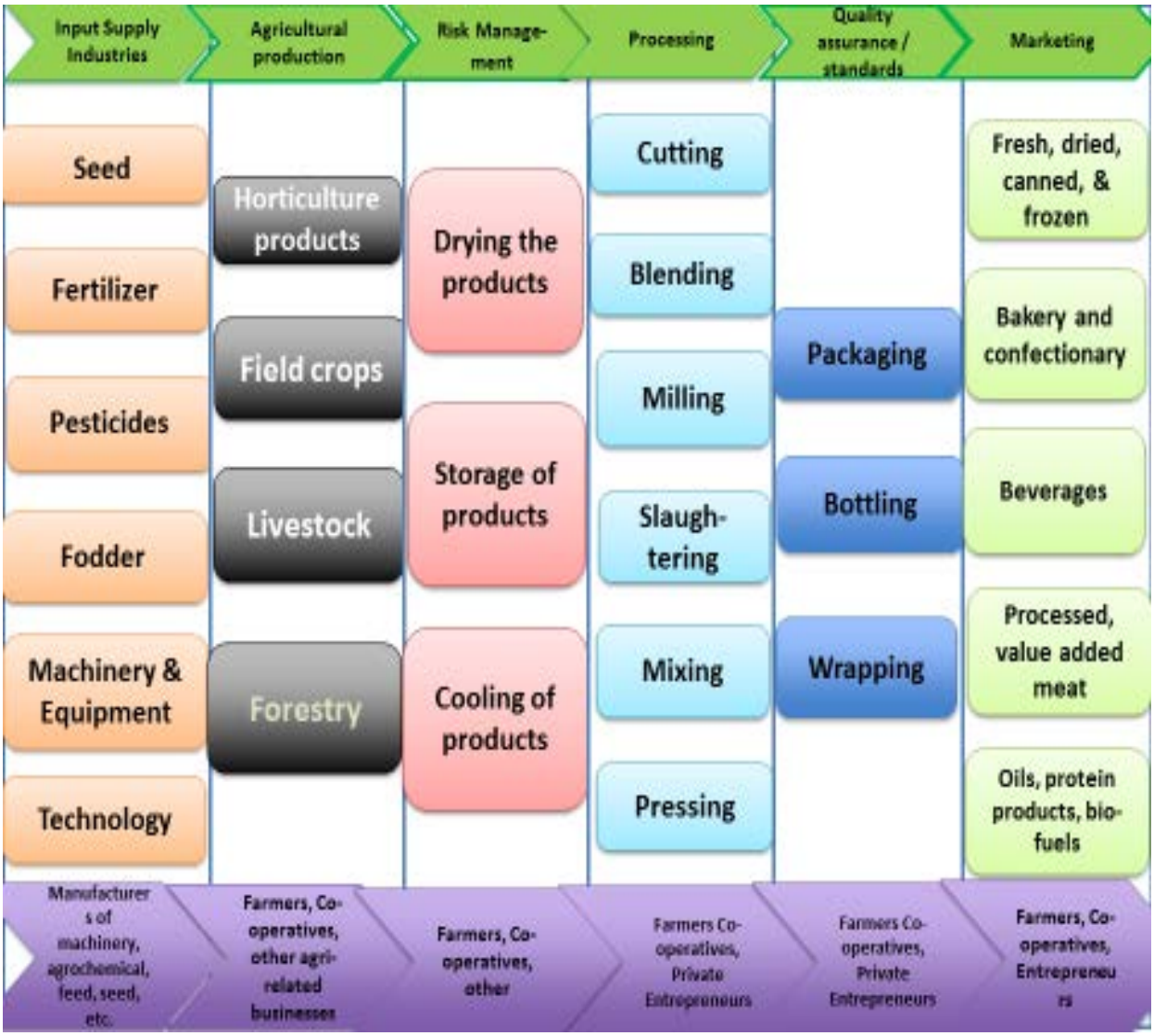


Figure 3.46: The general value-adding blueprint model for agro-processing.

Source: Author's own creation

The next few figures and descriptions will give an idea of the value-adding options for some of the identified new products that can be produced in the Free State. The two examples that are going to be showcased in more detail are prickly pears and the PX juice from alfalfa. The five product levels will be made applicable to the examples, to show the way to add value to such products.

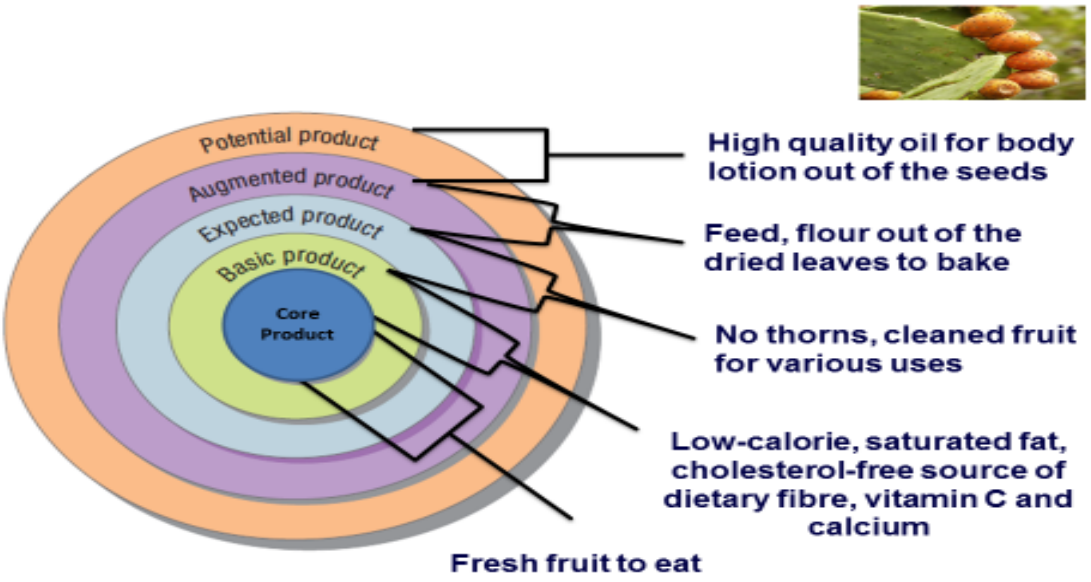


Figure 3.47: Value-adding example for prickly pears, using the five product levels

Source: Author's own creation

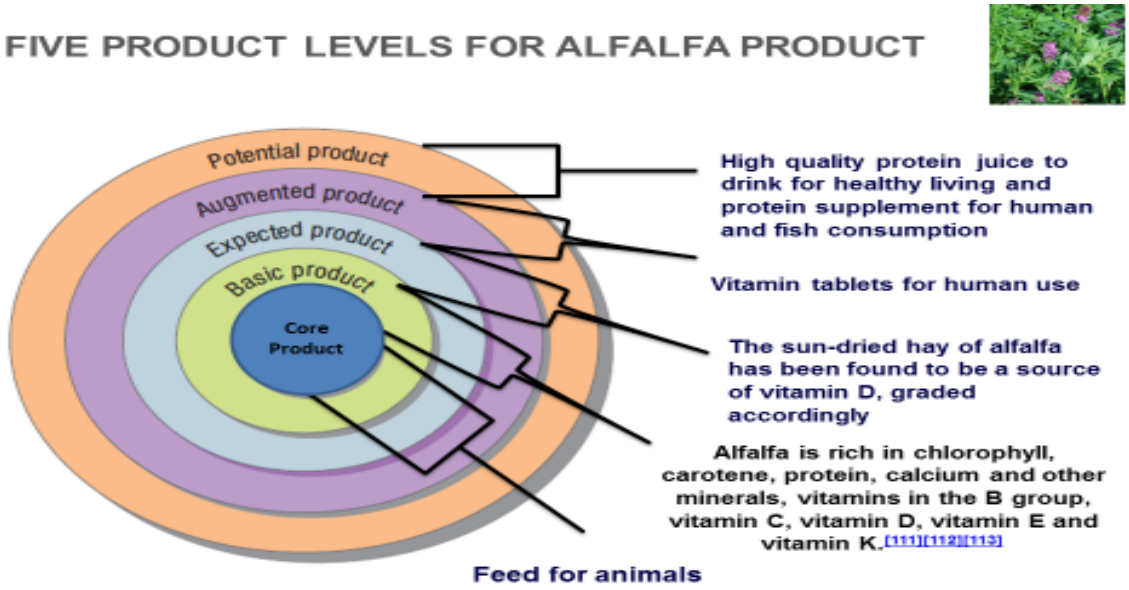


Figure 3.48: Value-adding example for alfalfa, using the five product levels

Source: Author's own creation

In both examples, the mentioned products are currently just using the core product, in the case of prickly pears as fruit and in the case of alfalfa as feed for animals. From Figures 3.47 and 3.48, it is clear that there are another four levels to add value to these products.

Using the value-adding blueprint (Figure 3.46), the gaps can be identified and then a fully-fledged business plan needs to be developed for each of the four value-adding levels to look at the feasibility, viability and sustainability. Subsequent to the business plan, it must be shown that the value-adding aspect is sustainable, and then the next step is to identify entrepreneurs, etc.

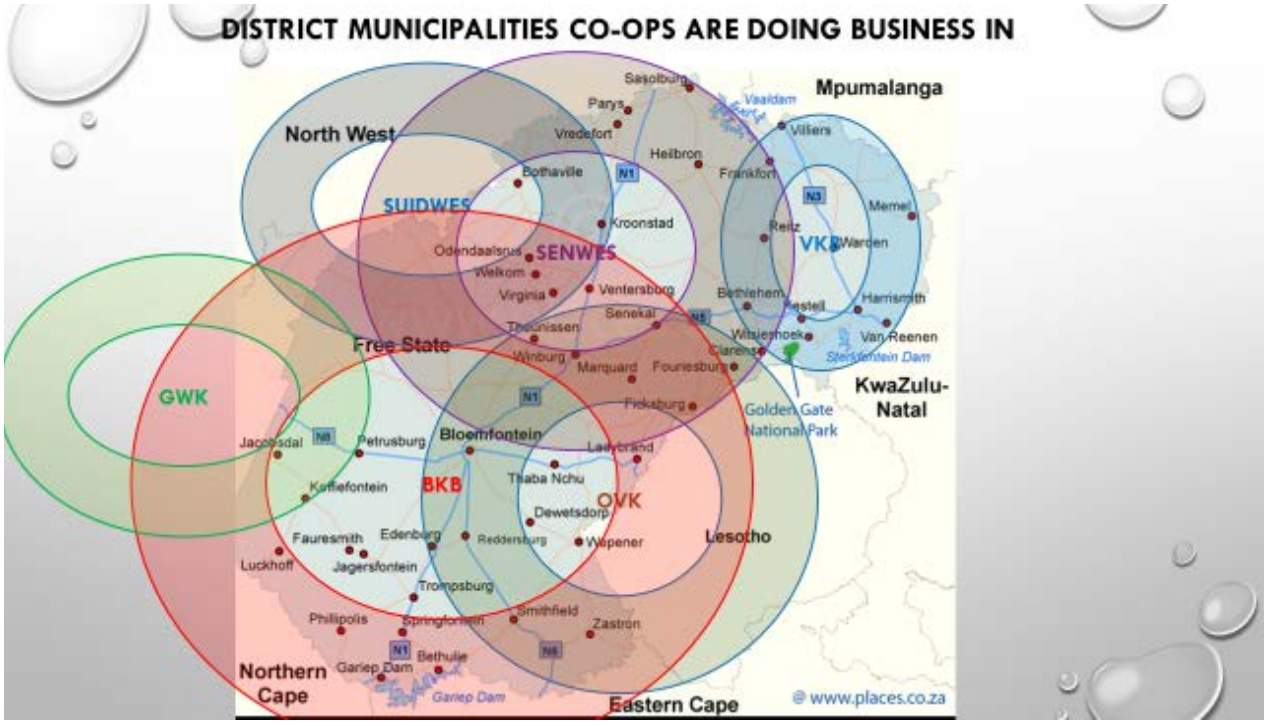


Figure 3.49: Co-ops doing business in the different district municipalities in the Free State

Source: Author's own creation

As can be seen from Figure 3.49, there are no specific boundaries for co-ops as in the late 90s. But, the idea is to show that in each district municipality there is at least one or more co-op doing business. Field crops are planted in all the different areas, and livestock is kept. There is really no difference in terms of what is or can be produced in a district municipality.

When looking at horticultural products, there is and can be a difference in the production per district municipality, depending on the rainfall, water from irrigation schemes as well as the type of infrastructure available. Figure 3.50 gives an idea of the differentiation amongst the different municipalities.

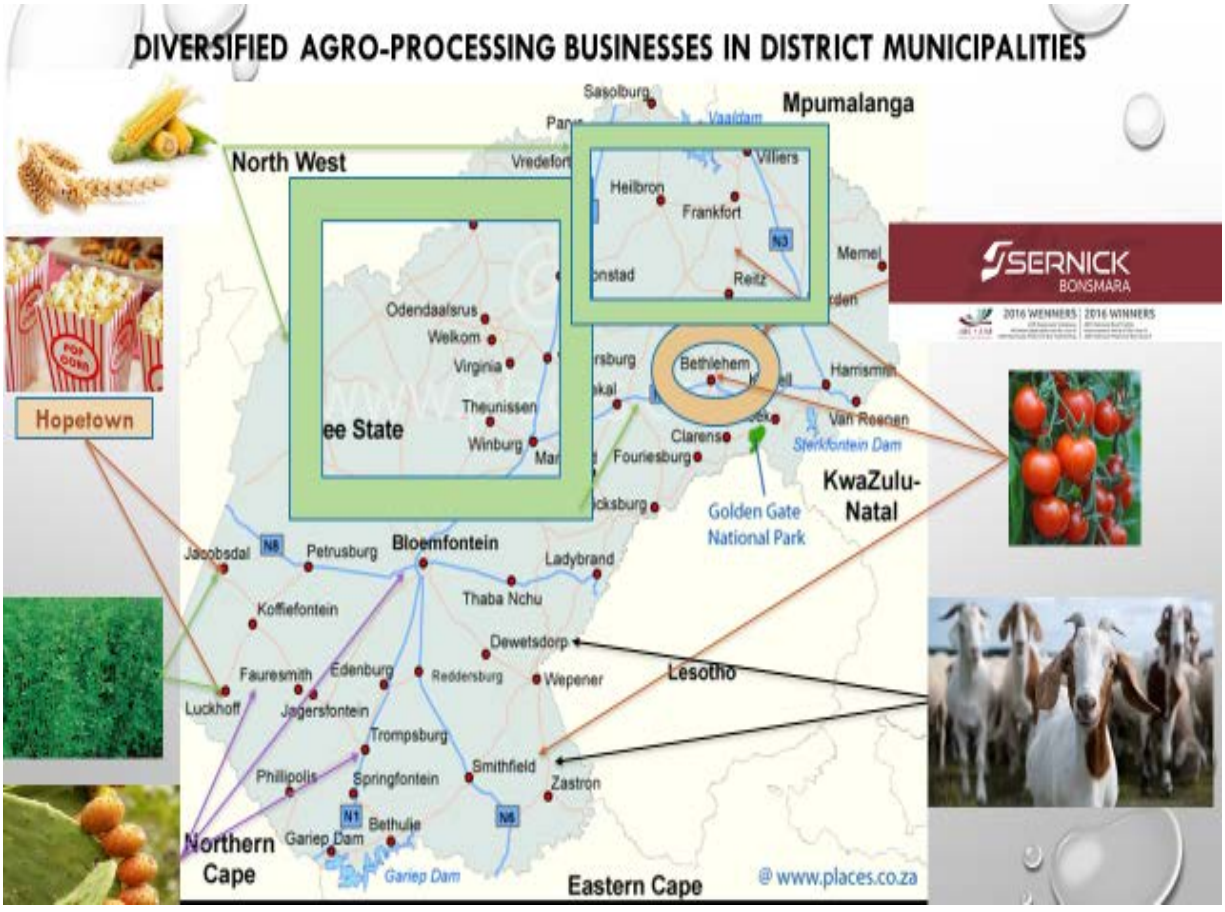


Figure 3.50: Horticultural production in district municipalities

Source: Author's own creation

Here are some examples, and these ideas will be discussed in more detail at the workshop.

3.7 Challenges experienced by start-up agro-processors

The following are some of the barriers of entry by small and medium agro-processors to penetrate and participate in the mainstream economy:

- High post-harvest losses;
- Inadequate funding instruments suitable to start-up agribusinesses;
- Lack of appropriate agro-processing technologies suited to start-up agro-processors;
- Non-compliance with stringent agro-processing norms, standards and regulations; and
- Intermittent supply of raw materials.

To mitigate these barriers to entry, DAFF has developed policy, strategy and programmes which inform the mandate of the Directorate in terms of aims and functions.

AIM: To develop and implement policies and strategies intended to improve competitiveness of agribusinesses through the processing of agriculture, forestry and fisheries products.

FUNCTIONS

Implementation of the DAFF strategy in support and development of agro-processing enterprises:

- Facilitate the implementation of enterprise and supplier development initiatives;
- Identify and encourage the use of novel and user-friendly agro-processing technologies with idiosyncratic features compatible with start-up agribusinesses;
- Facilitate and ensure compliance of start-up agro-processing enterprises with norms and standards (SABS) for processing facilities and processed products;

- Interact, liaise and collaborate with government departments, government agencies / entities and the private sector to systematically align and integrate agro-processing development initiatives to achieve rural industrialisation;
- Monitor and analyse the industry for provision of timeous and relevant agro-processing economic information; and
- Partner and collaborate with like-minded institutions to undertake applied research on pertinent technological, financial and economic determinants affecting the agro-processing industry.

3.8 Conclusion

Although some opportunities have already been seized upon by bigger role-players in some industries, there are still new and more advanced opportunities by just analysing new or in many cases current products and exploring the different options of value-adding to such a product. The analysis of the agricultural environment as well as the agro-processing environment reveals a few new and relatively obvious ideas that can be an opportunity for entrepreneurs and small-scale farmers to ensure that their turnover increases, and with the increase in turnover, also an increase in profits. Most of the mentioned opportunities fall into the category of creating more jobs per hectare than field crops or livestock.

The idea is that these possibilities should be further analysed for the Free State province to enhance the agro-processing contribution to manufacturing and also increase the overall GDP contribution to South Africa as a whole.

Chapter 4: Conclusion and recommendations

4.1 Conclusions around agro-processing

Having worked through all the primary and secondary information gathered in this report, the statistics guide the Free State Provincial Growth and Development Strategy to put even more emphasis on the identified agro-processing industry as a potential growth sector with potentially great opportunities for employment and economic diversification. In response to the potential of this growth opportunity, the Free State SME Development Initiative needs to contribute more to the creation of employment through small and medium enterprise [SME] development in the Free State Province. This can be done by means of investigating in more detail the interventions and opportunities mentioned in this report.

With the new land reform process in mind, the declining economy as well as the loss in job opportunities in different sectors, the agricultural sector can most certainly play a more important role in the Free State as well as the South African economy, despite the above-mentioned aspects of decline. The agro-processing industry, as explained in this report, can play a major role in the declining economy of the Free State when all potential opportunities are thoroughly investigated; the feasibility, viability and sustainability are calculated in a non-political manner but on economic and business principles to ensure success. .

The main aspects of the investigation into agro-processing in the Free State that need to be addressed to ensure success and for role-players to better understand the holistic picture of the agro-processing industry, the following points are important:

- The five different district municipalities in the Free State are in many ways different in regard to what can and is currently produced in terms of the agricultural industry. There are also many agricultural activities that are the same. For this reason each district should not be seen in isolation but

their relevant agribusiness sectors need to be added as a whole to contribute to the Free State agricultural production and agro-processing in total.

- There are several entrepreneurial opportunities in the agro-processing sector; especially new ideas around value-added products that are currently not explored to their final five product levels in the Free State.
- Free State agricultural production has the potential to grow substantially with a new vision around the production of new alternative products to add to the value-adding process. Particularly in economically depressed, rural areas, certain new production and agro-processing activities can provide the stimulus for new life in some rural towns. The participation of communities and SMMEs in the sector could therefore be inhibited by a lack of resources, skills and infrastructure. But in most developing countries, which have a more successful agricultural sector, the establishment of facilities and infrastructure was undertaken by government as the lack of the mentioned resources is potentially a binding constraint on the development of the sector.
- A few very interesting and potentially feasible, viable and sustainable gaps were identified to create more job opportunities, increase the output of current products and contribute to the economy (GDP) of the Free State, and
- Some important constraints within the agribusiness sector were found and by bridging them, the sector could also bloom.

4.2 Recommendations for agro-processing in the Free State

In Chapter 3 there are some recommendations after every section. In this chapter only the main recommendations will be highlighted. The following are the main recommendations for the project under a few main headings:

4.2.1 Field crops

- As shown in Chapter 3, there are not many opportunities for field crops in the Free State because of the reasons stated.
- Durum wheat can be an opportunity. A link or a joint venture with the GWK pasta factory can be an opportunity to be investigated.
- Soya beans are the product with the most potential for start-up farming. A negative factor is that they cannot be produced on a small scale because of economies of scale. An option is to cluster a few smaller farmers to farm together and then market their soya beans to a company in which they have shares, to add value to the product.
- Teff as a product that is currently only used for animal feed, but with a potential for adding value and producing a higher protein flour than wheat. This is an opportunity that needs to be investigated further to analyse all the opportunities.

4.2.2 Horticultural crops

- Looking at the Boston Matrix in Chapter 3, most of the new products with the potential for adding value on a smaller scale for small farmers as well as entrepreneurs, are horticultural products.
- The following are some products with processing potential:
    - Prickly pears
    - Pomegranates
    - Carrot / beetroot / PX/alfalfa juice
    - Grapes for wine making
    - Prickly pears is the horticultural product with the most potential to create value for more than one farmer / entrepreneur in the whole value-adding process (see figure BB). The Xhariep district is the perfect area to plant and produce the different products. The ideal climate for prickly pears is low rainfall and high heat during the day..

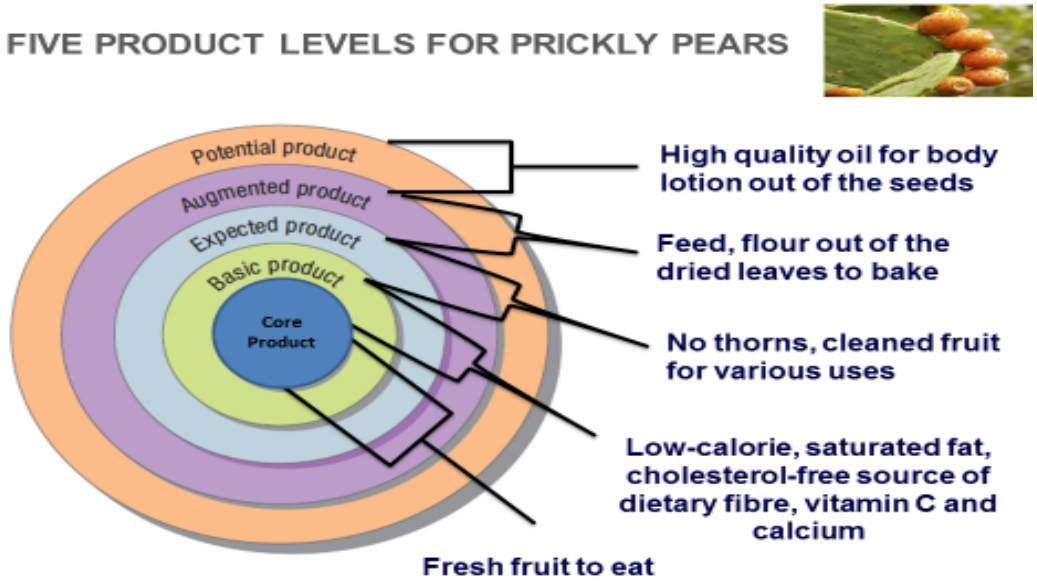


Figure 4.1: The five product levels for prickly pears

Source: Author's own creation

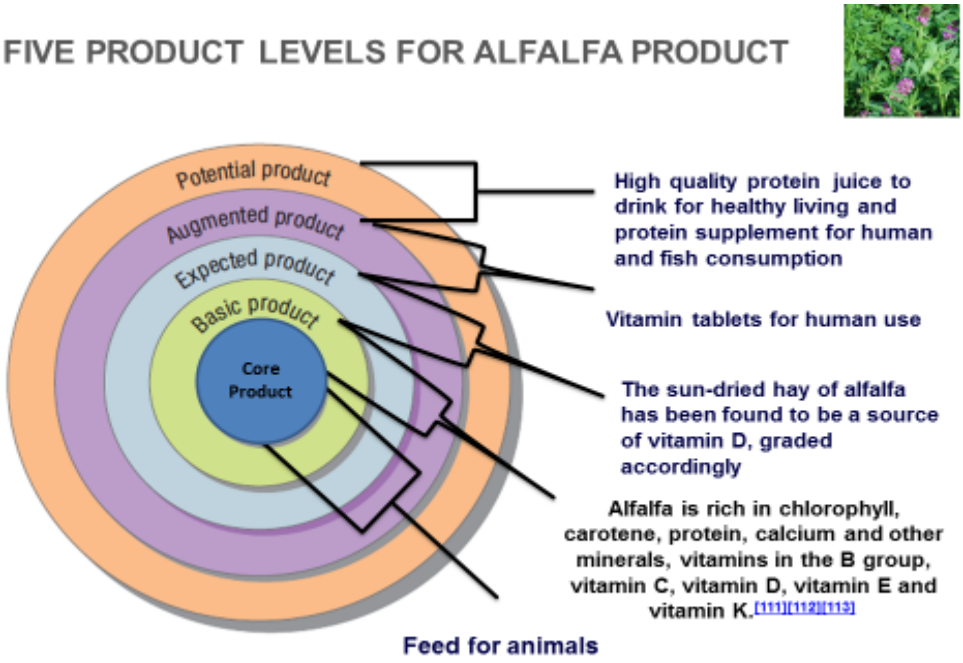


Figure 4.2: The five levels of value adding for alfalfa juice

Source: Author's own creation

- Wine grapes in the South Western Free State (Jacobsdal) can have some niche opportunities if a wine farmer can cooperate with the GWK Douglas Wine cellar to bottle the wine and sell the wine to a specific market that does not fall into the targeted markets of Douglas Wineries.

4.2.3 Livestock

- Livestock (cattle, sheep, goats, and pigs) can be farmed with on a small scale as well as on a bigger scale. The following are some important aspects to focus on:
    - Have a specific vision when farming with livestock, for example farming with sheep for wool production or meat production or to be a sheep stud farmer.
    - For a small-scale farmer to be more successful he needs to link up with a bigger commercial farmer to tap into the existing marketing channel of the commercial farmer. The main reason is “branding”. Immediately the small farmer will have access to this marketing channel with a well-known brand. There is just one condition to be agreed upon between the commercial farmer and the small farmer – the quality of the animal or product needs to be of a certain standard to be branded the same.
- There is a massively untapped market when looking at tripe or “afval” as it is known in South Africa. The following are some recommendations to take into account:
    - One supplier in the Xhariep district sells 12 tons of “afval” every 2 weeks from a small Free State town.
    - The average weight of the head and trotters is around 2.5kg. This is equal to approximately 2 400 heads per week. Per annum that would be 124 800 heads without additional marketing.

- Statistics indicate that the Free State province has 4,5 million heads of sheep available. The sale of this “afval” from one supplier represents 2,5% of the “afval” available in the Free State.
- There are two main target markets for “afval”. One is the lower LSM markets which buy the product because of the affordability for the value they receive. The other target market is the new delicatessen market in the metropolitan areas. The consumers in this market want a clean and ready to cook “afval”. This product now becomes a high-value-adding product with a bigger profit margin for the producer. To clean the “afval” is a more expensive exercise and the entrepreneur needs more capital intensive equipment to do it.

- To understand this market and the value chain to serve the market, a more intensive investigation needs to be done to ascertain the feasibility and the viability of an “afval” processing plant.
- Feedlots are an option for specific areas in the Free State and specifically closer to QwaQwa where there are communal farmers farming with cattle or sheep. If they can market their weaners to the feedlot they can realise a faster and higher income than to grow the weaners themselves. After some thorough investigation from feedlot specialists, there is no specific feedlot size that is the ideal feedlot for numbers to be sustainable. There are many determinants and costs that have an effect on the sustainability.
- Pig farming can also be an opportunity to start on a small scale. Again, if the small-scale farmer can join a larger pig farmer for linking up with the brand and marketing channel.
- Another option, when a pig farming activity is big enough, is to use the pig dung to generate electricity from biogas. This is a new option for South Africa but in countries like Canada and Scotland it is well-known.

4.2.4 Forestry

- Department of Agriculture, Forestry and Fisheries – Free State Province

- The purpose of the directory is to provide contact details of Extension and Advisory Services offices located in districts and municipalities in the Free State Department of Agriculture and Rural Development. The directory further provides the list of extension personnel and advisors with their contact numbers, emails and the specific commodity focus area each individual specialises in.
- Each province has a coordinator responsible for Extension and Advisory Services. This slot provided information on the Senior Manager/s or Coordinator of Extension and Advisory Services for the entire province.
- For all the five districts of the Free State province the department has appointed a District Director and this directory shows their physical address, telephone numbers and the e-mail address. Contact details of the Assistant Director are also shown in the directory.
- The Free State province does not have the potential currently to compete with any other province, for example the Western Cape, with any wood and wood processing activities.
- The only potential for wood processing is to cut and process the intruder bushes and produce the following products (see Figure 4.x):
    - Pellets for animal feed
    - Wood blocks for braais and fire places
    - Chopped wood for covering garden beds for less evaporation

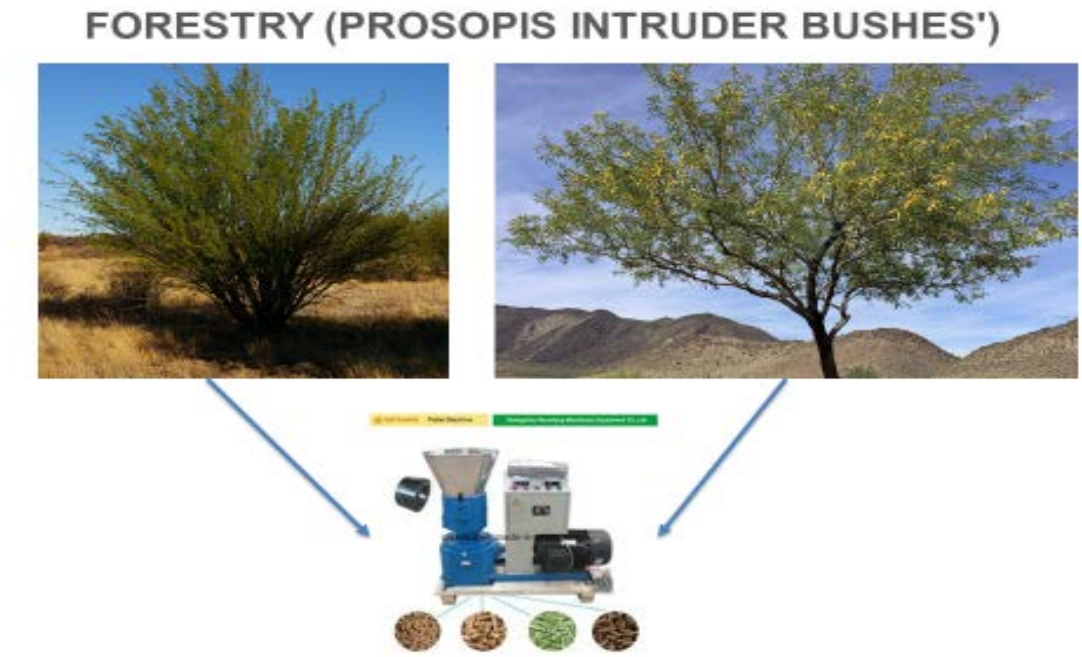


Figure 4.3 (a): Example of products from intruder bushes

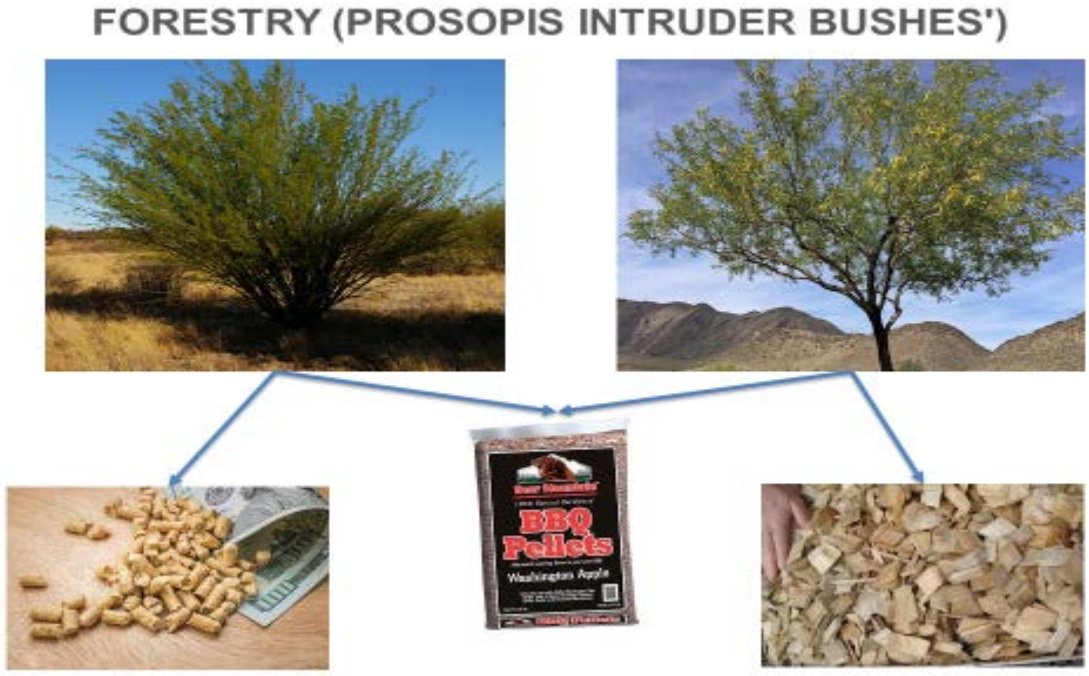


Figure 4.3 (b): Example of products from intruder bushes

There are some opportunities for entrepreneurs to start a business to remove the intruder bushes and then process products to sell. The income will be twofold for an entrepreneurial business like this because farmers will pay the entrepreneur to remove the bushes and then the entrepreneurs can pack and sell the processed products to different target markets.

4.3 General recommendations

Taking the recommendations into account around the different new options in the agro-processing market, the following is also important:

- Choose agro-processing where more job opportunities can be created per hectare produced.
- Horticultural products create more job opportunities than livestock and field crop products.

The sustainability of agro-processing in the Free State cannot be successful without the following recommendations:

- Every agro-processing value chain needs to be strategically planned with a fully-fledged business plan to back the project.
- There needs to be a clear indication in the business plan of the role of government as well as each one of the other role-players.
- Role-players and beneficiaries need to be chosen on a basis that each one is selected via the same criteria. A matrix model can be the solution to do the selection.

Appendix A: Livestock detail

Goats										
Quarter	**Western Cape**	**Northern Cape**	**Free State**	**Eastern Cape**	**KwaZulu-Natal**	**Mpuma-langa**	**Limpopo**	**Gauteng**	**North West**	**RSA**
Aug-96	249 428	544 456	226 500	2 680 466	833 129	81 814	1 017 024	67 962	700 409	**6 401 188**
Aug-16	212 735	495 470	231 707	2 184 049	727 877	86 294	997 063	32 471	673 249	**5 640 915**
Nov-16	210 168	492 562	231 934	2 149 151	722 622	86 974	989 943	31 814	668 481	**5 583 649**
Feb-17	209 936	489 044	229 741	2 121 771	705 169	85 723	983 864	29 826	679 811	**5 534 885**
May-17	209 732	487 068	228 548	2 120 770	714 078	85 537	988 505	29 765	670 497	**5 534 500**
Aug-17	208 642	482 428	222 666	2 097 339	712 139	82 572	971 388	29 017	668 609	**5 474 800**
Nov-17	208 377	478 351	218 114	2 087 516	705 083	81 852	962 549	29 053	666 605	**5 437 500**
Feb-18	209 401	477 014	217 407	2 085 438	701 023	82 256	962 549	29 688	661 721	**5 426 497**
May-18	208 190	475 295	218 430	2 074 217	704 595	82 205	962 549	29 017	666 410	**5 420 908**
Pigs										
Aug-96	171 470	29 259	212 437	151 693	194 832	117 179	318 679	174 274	329 221	**1 699 043**
Aug-16	167 854	25 118	121 006	91 434	149 473	121 562	360 833	159 381	315 792	**1 512 453**
Nov-16	166 038	24 868	120 347	90 457	150 439	120 435	358 437	158 497	320 118	**1 509 636**
Feb-17	164 384	23 873	119 063	88 743	150 368	117 908	356 122	154 099	315 792	**1 490 352**
May-17	162 859	23 548	118 806	87 993	149 364	117 060	359 138	156 873	315 566	**1 491 207**
Aug-17	166 914	23 324	116 474	89 176	147 169	117 987	352 762	156 376	310 657	**1 480 839**
Nov-17	162 431	21 530	117 339	88 386	145 816	116 795	350 575	157 604	309 600	**1 470 076**
Feb-18	160 437	21 530	115 745	87 633	145 021	117 321	353 098	158 459	310 325	**1 469 569**
May-18	161 402	20 409	114 774	87 703	144 795	117 987	353 098	156 264	305 479	**1 461 911**
Sheep										
Aug-96	3 380 875	7 643 115	5 967 322	7 887 428	1 030 860	1 913 372	199 606	107 364	803 581	**28 933 523**
Aug-16	2 756 857	5 768 455	4 516 907	6 866 145	727 296	1 692 152	234 642	95 062	629 731	**23 287 247**
Nov-16	2 752 784	5 749 177	4 516 699	6 855 673	724 726	1 679 151	232 875	92 222	628 360	**23 231 667**
Feb-17	2 709 305	5 716 352	4 536 177	6 815 132	720 664	1 675 296	226 681	89 783	618 950	**23 108 340**
May-17	2 706 834	5 674 966	4 534 294	6 803 207	719 562	1 680 629	228 651	92 408	620 928	**23 061 479**
Aug-17	2 695 295	5 582 212	4 521 183	6 621 912	691 710	1 651 588	224 865	92 249	607 916	**22 688 930**
Nov-17	2 688 065	5 552 122	4 508 931	6 612 824	682 539	1 642 513	222 988	92 844	606 497	**22 609 323**
Feb-18	2 684 573	5 529 366	4 502 076	6 614 611	679 544	1 667 927	223 692	93 177	610 332	**22 605 298**
May-18	2 663 987	5 504 886	4 505 418	6 645 818	691 127	1 612 437	217 611	92 160	615 653	**22 549 097**
Cattle										
Aug-96	477 681	466 275	2 113 886	2 684 972	3 020 720	1 406 937	1 250 700	258 780	1 709 478	**13 389 429**
Aug-16	552 213	491 983	2 232 422	3 268 423	2 633 362	1 372 861	986 807	246 426	1 615 775	**13 400 272**

Nov-16	541 697	491 284	2 230 593	3 254 683	2 605 090	1 364 922	981 708	245 768	1 602 055	**13 317 800**
Feb-17	528 074	501 407	2 220 133	3 221 505	2 517 724	1 313 321	979 596	246 135	1 618 238	**13 146 133**
May-17	527 277	485 075	2 220 537	3 203 349	2 517 281	1 313 764	983 636	247 144	1 619 046	**13 117 109**
Aug-17	517 656	479 256	2 178 674	3 148 679	2 495 547	1 325 782	981 432	246 426	1 579 936	**12 953 388**
Nov-17	516 687	473 873	2 171 695	3 141 228	2 461 228	1 320 027	980 934	246 861	1 581 686	**12 894 219**
Feb-18	515 118	475 946	2 168 240	3 139 153	2 482 942	1 323 814	977 459	247 290	1 588 147	**12 918 109**
May-18	509 865	444 622	2 182 921	3 145 797	2 485 305	1 285 331	941 813	246 395	1 583 543	**12 825 592**

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