Agriculture Sector Analysis

Chapter 7

7. AGRICULTURAL INDUSTRY ANALYSIS

O.R. Tambo District Municipality possesses potential over a wide range of number of agricultural activities. As a result, the district contributes towards provincial production in a similarly wide range of commodities, predominantly within the subsistence and emerging market sectors. Several of these are apparent, such as the rural livestock rearing, and subsistence maize farming. The following agricultural activities are currently noted as being produced in the O.R. Tambo District, either on a commercial or subsistence basis:

- Subsistence Maize Production
- Subsistence Vegetable Production
- Fruit Production
- Tea production
- Subsistence livestock rearing, predominantly cattle, goats, and sheep (including wool)
- Forestry
- Game rearing
- Bee-keeping and apiculture.
- Aquaculture (O.R. Tambo District Municipality (2015))

The district has a diverse range of activities occurring, as evident from the above list. Section 7 seeks to identify opportunities within the market that have not yet been fully realised for development within the district. The dynamics of each of the above products or commodities will be discussed for their current production status in the District.

7.1 Main agricultural activities of the district

7.1.1 Subsistence Maize Production

Dry-land and irrigated maize production is an important national crop as it provides a number of households with staple food consumptions and food security, particularly in rural areas, like those within O.R. Tambo District Municipality. In terms of production, yellow maize is mostly used in animal feed, with some rural areas farming it for human consumption, while white maize is grown exclusively for human consumption. Yellow maize is the more popular crop in the district.

A number of studies have indicated that the O.R. Tambo District Municipality has high potential for large-scale maize production, however the district contributes marginally towards provincial total production, limiting any kind of processing operation within the region. Current examples of these include small-scale maize mills in Mthatha (O.R Tambo District Municipality, 2015).

7.1.2 Subsistence Vegetable Production

Vegetables are largely grown in home gardens which are basically depended on rainfall and hand watering. But there are few irrigation projects in which vegetables are grown all-year round. To name the few there are Vukuzenzele project, Ndibongo project & Bhedla project (K.S.D.), Gqunu, Ngxakolo, Tsilitwa & Tsolo community (Mhlontlo), Umzimvubu Valley Farms (P.S.J.), Phakathi vegetables (Ngquza Hill). Vegetables produced include cabbages, spinach, carrots, onions, green pepper, tomatoes, potatoes, beans, peas, sugar beet (O.R Tambo District Municipality, 2015).

7.1.3 Fruit Production,

O.R. Tambo currently has limited fruit production, with tomatoes being the current signature crop within the district. The most recent production figures, from the Agricultural Census 2007, indicates that the district is a minor contributor towards provincial production, producing only 117 000kg, around predominantly produced around Mthatha. However, O.R. Tambo District Municipality has potential for fruit production along the coastal regions, including citrus, stone & deciduous fruit, and bananas. The Port St Johns Local Municipality land suitable for bananas is the southernmost region in which bananas can be grown in South Africa, enabling unparalleled access to the Eastern Cape metropolitan markets for this good.

There are fruit orchards at Ndibongo project, Bhedla project, Ngcwanguba, Coffee Bay, Hole in the Wall (King Sabatha Dalindyebo, Umzimvubu Valley orchards, Mngazana bananas (Port St Johns). Trees grown there include citrus, bananas, peaches, pecan-nuts (O.R Tambo District Municipality, 2015).

7.1.4 Tea production

The international tea market is subject to volatile prices and decreasing demand. Prices increased through to 2012, before declining in both 2013 and 2014. Tea has been determined to be price inelastic, with price decreases leading to over-compensating increases in demand. However, decreasing prices can hurt inefficient operations who are not producing low enough to service the market. South Africa does export tea, exporting 5 200 tonnes in 2013, improving on the previous year's 2 8 00 tonnes. In terms of production, South Africa produced 2 500 tonnes in 2013, improving on 2012's 2 200 tonnes. South Africa consumed 22 800 tonnes in 2013, its lowest consumption between 2009 and 2013.

O.R. Tambo District Municipality possesses the largest tea estate in the Southern Hemisphere, located at the Magwa Estate, near Lusikisiki in Ngquza Hill Local Municipality. The estate has untapped potential for further development, over and above the 1.7 – 1.9 million kg production potential each year, which would hinder economic development of any potential tea initiatives in the district. Massive labour actions, however have hampered production in recent periods. The neighbouring Majola Tea Estate, in Port St Johns, also suffers from similar problems (O.R Tambo District Municipality, 2015).

7.1.5 Subsistence livestock rearing, predominantly cattle, sheep and goats

The beef industry is the largest farming activity in terms of livestock numbers in the O.R. Tambo District Municipality, providing meat to a significant number of consumers. Emerging farmers are still struggling to increase cattle numbers and in some cases lack the technical ability to maximise resources.

Beef cattle production in the O.R. Tambo District Municipality is confined primarily to small-scale emerging farmers and homestead based subsistence farmers. There is an abattoir in Mthatha and the other small-scale butcheries throughout the district, however these are insufficient to meet demand. Table 7.1 shows the sheep and cattle currently within the district.

Table 7.1 - Livestock Numbers in O.R. Tambo District Municipality, by Local Municipality

Municipality	Cattle	Sheep
King Sabatha Dalindyebo	89 913	625 477
Mhlontlo	63 213	213 612
Nyandeni	88 413	281 612
Ngquza Hill	54 264	70 660
Port St Johns	32 000	16 950
Totals	**327 803**	**1 208 311**

Source: ORTDM Draft Business Plan (2015)

Beef cattle production remains spatially important and is a multifunctional livelihood strategy in rural South Africa. This is especially true in marginal and remote areas with poor agricultural lands and minimal economic opportunities.

It has been estimated that 5.6 million cattle (40 % of the total cattle population) are owned by 240 000 small-scale farmers and 3 million subsistence farmers. For the livelihoods of these small-scale producers, cattle farming has multiple functions. Non-commercial motives include economic functions (e.g. wealth storage), agro-economic functions (e.g. provision of draught power), agro-ecological functions (e.g. provision of manure), nutritional (e.g. provision of milk for infants) and socio-cultural functions (e.g. dowry). (Ndoro et al., 2014)

Sheep farming is practiced throughout most of the O.R. Tambo District Municipality. These fat lamb and wool producers are however not a homogenous group with production intensity and sheep diversity levels varying considerably from farmer to farmer. This is particularly evident amongst commercial, emerging and subsistence farmers.

The declining production of mutton, attributed to a reduction in the number of sheep numbers (due to predation and stock theft) and rapid population growth rate, has led to a shortage in the supply of mutton, and subsequently a rise in prices (O.R Tambo District Municipality, 2015).

7.1.6 Forestry

Plantation forestry provides the raw materials for all downstream activities associated with the forestry industry such as pulp milling, paper manufacturing, saw milling and certain furniture manufacturing. The development of plantation or indigenous forestry can also play an important role in environmental services such as through the conservation of soil; water and biological diversity.

Forestry plantations in Eastern Cape are primarily located in the eastern part of the provinces in the Joe Gqabi (Elundini), Alfred Nzo, O.R. Tambo (Mhlontlo, Port St. Johns, Ngquza Hill) and Amathole District Municipalities. There is also a large block of plantations located in the Tsitsikamma area in the southernmost part of the Sarah Baartman District Municipality. These plantations account for an estimated 141 000 hectares of land with a further 230 000 hectares of land containing natural forests.

The O.R. Tambo District Municipality accounts for approximately 23.3% of the total area under forestry plantation in the Eastern Cape. Hans Merensky serves as the regional primary processor, producing a variety of products. There are very few furniture manufacturers in the district (O.R Tambo District Municipality, 2015).

7.1.7 Aquaculture

Aquaculture, which involves the propagation, improvement and rearing of both plant and aquatic based organisms in fresh, sea or brackish waters, is a relatively new production sector in South Africa. Accordingly knowledge about the technologies utilised, business principles and impacts are still limited. Aquaculture production however does occur within the O.R. Tambo District Municipality.

There are only a limited number of aquaculture facilities currently operating. At present there is only one facility operating in the Nyandeni Local Municipality O.R. Tambo) which produces crayfish. There are also plans to develop an aquaculture facility at the Tsolo Agricultural College (O.R Tambo District Municipality, 2015).

7.1.8 Bee-keeping & apiculture, and Game rearing.

Bee farming is O.R. Tambo District Municipality's promising enterprises and is being practiced by small-scale producers. They are realising an income through this. The DRDAR is supporting these farmers through provision of infrastructure and extension services. Sites are throughout the district, with Mjika Beekeepers at Tsolo and Chwebeni Beekeepers at Port St Johns

There are few wild life farms in O.R. Tambo District Municipality, which include Nduli Nature Reserve (K.S.D.), Mkambati and Msikaba Game Reserves (Ngquza Hill), Mngazi (Port St. Johns), and Hluleka Nature Park (Nyandeni) (O.R Tambo District Municipality, 2015).

7.2 Current and proposed projects in the region

There are multiple project categories for economic, social and socio-economic development within South Africa. The following section brings to the fore the more common project types, namely REID, RID, CASP, LRAD, Ilima/ Letsema, and others, that are applicable to the O.R. District Municipality.

7.2.1 Rural Enterprises and Industrial Development (REID)

REID was established by the Department of Rural Development. It aims to create an enabling institutional environment for vibrant and sustainable rural communities. REID consists of four units. Each unit is briefly described below:

- The social organisation and mobilisation unit, which is responsible for the promotion of participatory approach to rural development.
- The technical support, skills development and nurturing units, this unit provides technical support to institutions and organisations in rural communities through skills and capacity building.
- The Institutional Building and Mentoring unit is responsible for facilitating, building and mentoring institutions in rural communities.
- The rural livelihoods and food security unit, that is responsible for facilitating strategic partnerships that would promote economic and rural enterprise development. Strategic partners are from the private sector, government entities and international organisations. These strategic partnerships also facilitate value added services such as agro-processing and the establishment of village industries and enterprises.

There are five REID projects operating in O.R. Tambo District Municipality.

7.2.2 Rural Infrastructure and Development (RID)

The Rural Infrastructure and Development initiative was established and run by the DRDLR in order to facilitate rural infrastructure development strategies for socio-economic growth. The key role of RID is to provide ICT, economic and social infrastructure necessary to uplift rural communities. The functions of the programme include provision of economic and ICT infrastructure and development services; facilitation of social infrastructure, development and adaptation of innovative and appropriate technologies within rural areas.
RID also intends to facilitate access to additional funding to implement infrastructure project services, to provide project management functional specific support to RID in provinces, to provide financial and administrative support services and finally to provide service delivery coordination services.
An example of how RID links with other projects is that it would, for example, provide the fencing for a project area while REID will provide the funding and invest in food gardens.
There are three RID projects operating in O.R. Tambo District Municipality.

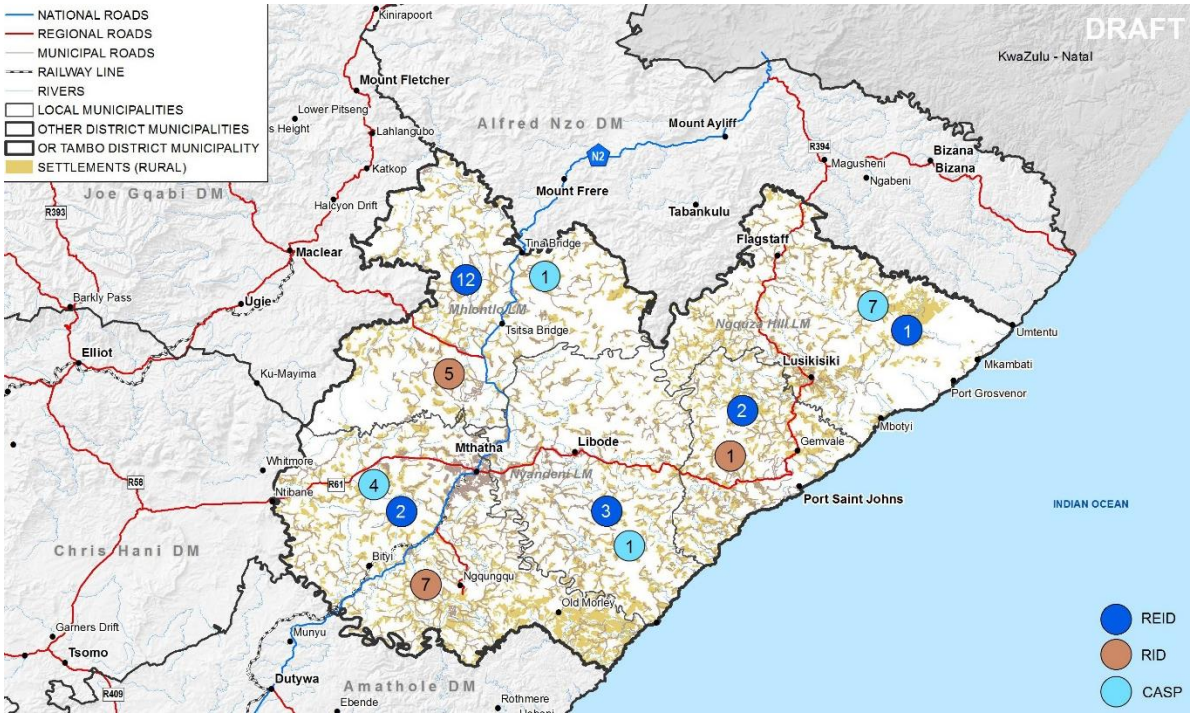
7.2.3 Comprehensive Agricultural Support Programme (CASP)

The Comprehensive Agricultural Support Programme is a Dept. of Agriculture, Fisheries and Forestry project, supported by National Treasury, which seeks to provide agricultural support to land and agrarian reform projects.

The strategic goals of the CASP programme are to create a favourable and supportive agricultural service environment for the farming community, including subsistence, smallholder and commercial farmers.

Grants are allocated with the aim of expanding the provision of agricultural support services and the promotion & facilitation of agricultural development by targeting smallholder and previously disadvantaged farmers.
There are four CASP projects operating in O.R. Tambo District Municipality.

Map 7.1 - DRDLR Projects in O.R. Tambo District Municipality



Source: DRDRLR (Urban-Dynamics) (2015)

7.2.4 Ilima/ Letsema

The Ilima Letsema initiative was established in 2008 and reformed in 2013 by the DAFF with the aim of encouraging food gardens among to support food security in rural areas. The funding originated with the special poverty allocations made by National Government for a specific purpose and a conditional grant enables government to ensure that specific projects are targeted. The funding will look to support small emerging farmers and takes the form of grants given to farmers. The grant is given to farmers who apply and uses a grant framework to assist targeted vulnerable South African farming communities to increase agricultural production and improve farming skills. Some of the funding goes towards strategic interventions like the rehabilitation of irrigation schemes.

The expected outcomes from this project includes:

- Increased production efficiency
- Increased agricultural production for the targeted group
- Improved ability of targeted group to cope with high food prices.
- Improved food production at both household and national level.

In 2012 it is noted that a total of 4 021 farmers had been supported through the Ilima Letsema programme. Through this programme, farmers will be trained in appropriate agricultural practices, the number of hectares under production will increase and new irrigation schemes will be established.

There are five Ilima/Letsema projects operating in O.R. Tambo District Municipality.

7.2.5 Integrated Development Plan (IDP)

District Municipality Integrated Development Plans (IDP) are an overarching guidance plan with associated budget for overall district development. It aims to co-ordinate the work of local and other spheres of government in a coherent plan to improve the quality of life for all the people living in an area. It should take into account the existing conditions and problems and resources available for development. The plan should look at economic and social development for the area as a whole. It must set a framework for how land should be used, what infrastructure and services are needed and how the environment should be protected.

All municipalities have to produce an Integrated Development Plan (IDP). The municipality is responsible for the co-ordination of the IDP and must draw in other stakeholders in the area who can impact on and/or benefit from development in the area.

Once the IDP is drawn up all municipal planning and projects should happen in terms of the IDP. The annual council budget should be based on the IDP. Other government departments working in the area should take the IDP into account when making their own plans.

The IDP develops projects in conjunction with regional and provincial government departments to aid specific development objectives. Funding for District IDP projects is accessed through these government departments, from the District IDP budget and through other funding avenues and mechanisms.

There are 15 IDP projects in Ngquza Hill and Port St Johns Local Municipalities, and 30 in the other three local municipalities.

7.2.6 Social Relief Projects

Social relief projects are generally temporary assistance projects for those in dire need of support. In the case of the agricultural sector, social relief projects are generally directed at those who have experienced a natural disaster such as drought, fire or floods. Social relief projects are funded by a number of organisations, including the private sector.

There are 17 social relief projects active within O.R. Tambo District Municipality, specifically the King Sabatha Dalindyebo Local Municipality.

7.2.7 Special Projects

Special projects are projects that are usually large and unique in nature which have specific goals that are linked to national and regional development. Examples of these projects include IDZs and large infrastructure projects such as dams and electricity projects.

There are two special relief projects operating in the O.R. Tambo District Municipality.

7.2.8 Land Redistribution for Agricultural Development (LRAD)

The Land Redistribution for Agricultural Development (LRAD) programme was designed to help previously disadvantaged citizens from African, Coloured and Indian communities to buy land or agricultural implements specifically for agricultural purposes. The LRAD grant is made available as a non-refundable form of funding or financial contribution to help prospective farmers to purchase land by government.

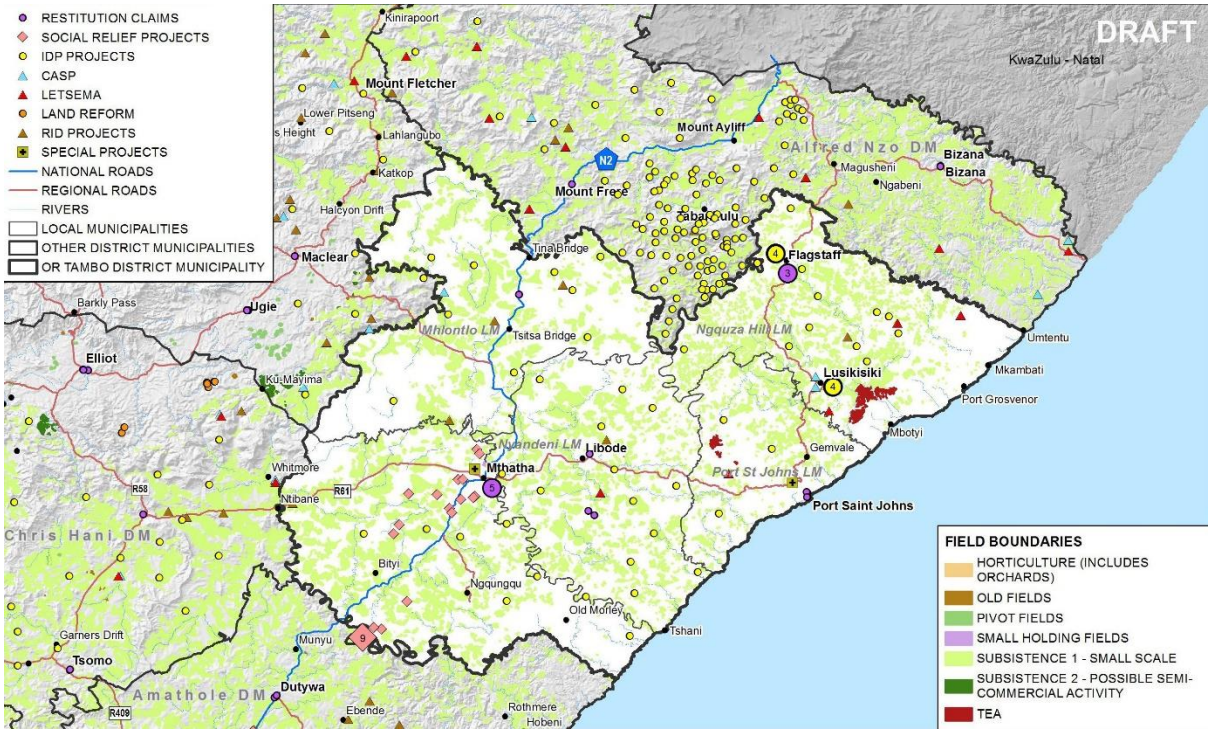
The grants are made available through the Dept. Land Affairs with assistance from the Dept. of Agriculture, Fisheries and Forestry. Funds can be used for the acquisition of land or the financing of land improvements, infrastructure investments, capital assets and short-term agricultural inputs.

LRAD funding is made available to beneficiaries at various levels, these are:

- **Safety-net projects:** This is the level at which beneficiaries will acquire land to produce mainly for own consumption.
- **Equity schemes**: Members of a group will each contribute a certain amount towards accessing the grant. In turn, each member will own a certain percentage of the project according to the degree of their contribution.
- **Production for markets:** Some people will enter the programme at a much higher level than the ones mentioned above. These people will most probably have more farming experience as well as access to additional finance through normal bank loans as well as their own assets and cash to purchase bigger farms and therefore farm on a much larger scale.
- **Agriculture in communal areas:** Quite a number of people in communal areas already have secure access to agricultural land, but may not have the money to start using that land productively. Such people will be allowed to apply for assistance to start putting up productive investments on the land.

There are no LRAD projects listed for O.R. Tambo District Municipality.

Map 7.2 - DRDLR Projects in O.R. Tambo District Municipality



Source: DRDRLR (Urban-Dynamics) (2015)

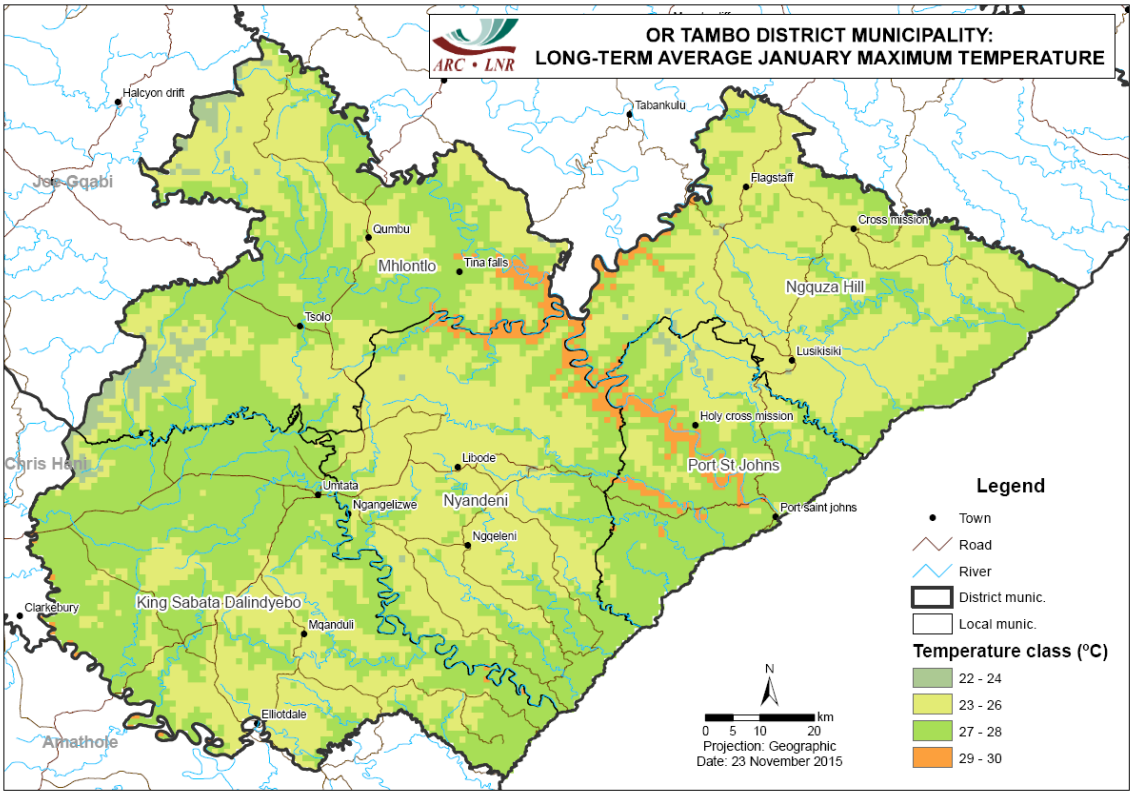
7.3 O.R. Tambo District Municipality Environmental Profile

7.3.1 O.R. Tambo District Municipality Temperature Analysis

Decadel (ten day period) 1km by 1km surfaces were created from temperature data (1920 - 1999) downloaded from the AgroMet databank at the ARC-ISCW (South African Weather Service and ISCW weather stations) from stations with a recording period of 10 years or more. Regression analysis and spatial modelling were utilised taking into account topographic indices such as altitude, aspect, slope and distance to the sea during the development of the surface. Monthly averages were calculated (Malherbe & Tackrah, 2003).

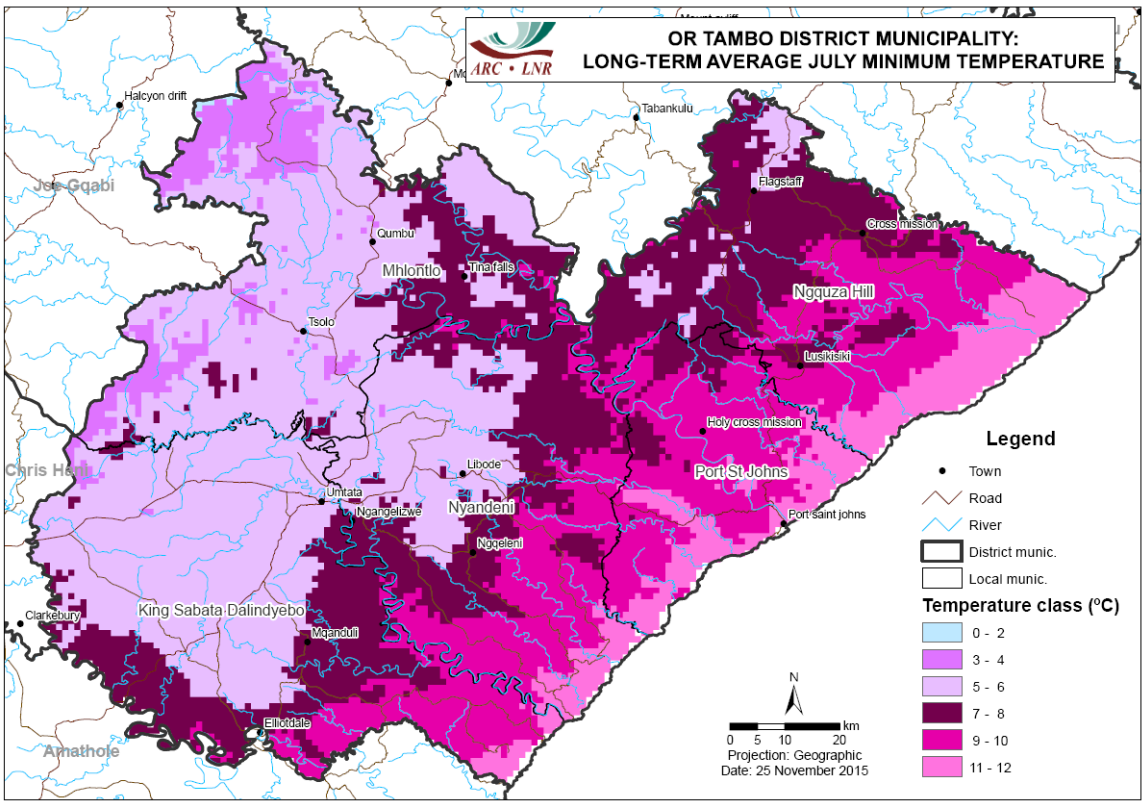
The long-term average maximum temperatures for O.R. Tambo District Municipality are mostly between 27° and 28°C for January, the exception are the river valleys with maximum temperatures between 29° and 30°C of (Map 7.3) and the long-term average minimum temperatures between 3° and 6°C for inland areas and between 9° and 12°C for the coastal areas in July (Map 7.4). The difference in summer temperatures between the river valleys and the adjacent areas allow for different crop selection over a relatively small area. The river valleys are mostly also characterise by deeper alluvial soils, with a higher agricultural potential.

Map 7.3 - Long-Term Average January Maximum Temperatures



Source: Agricultural Research Council - LNR (2015)

Map 7.4 - Long-Term Average July Minimum Temperatures



Source: Agricultural Research Council - LNR (2015)

According to Schulze (2008) the heat units (0 days) for January for the area is between 360 and 380 near the coast and between 320 and 340 for the inland areas. The July values is > 120 near the coast and between 80 to 120 for the inland areas. The positive chill units for July is mostly between 100 and 200 PCUs for the O.R. Tambo District Municipality.

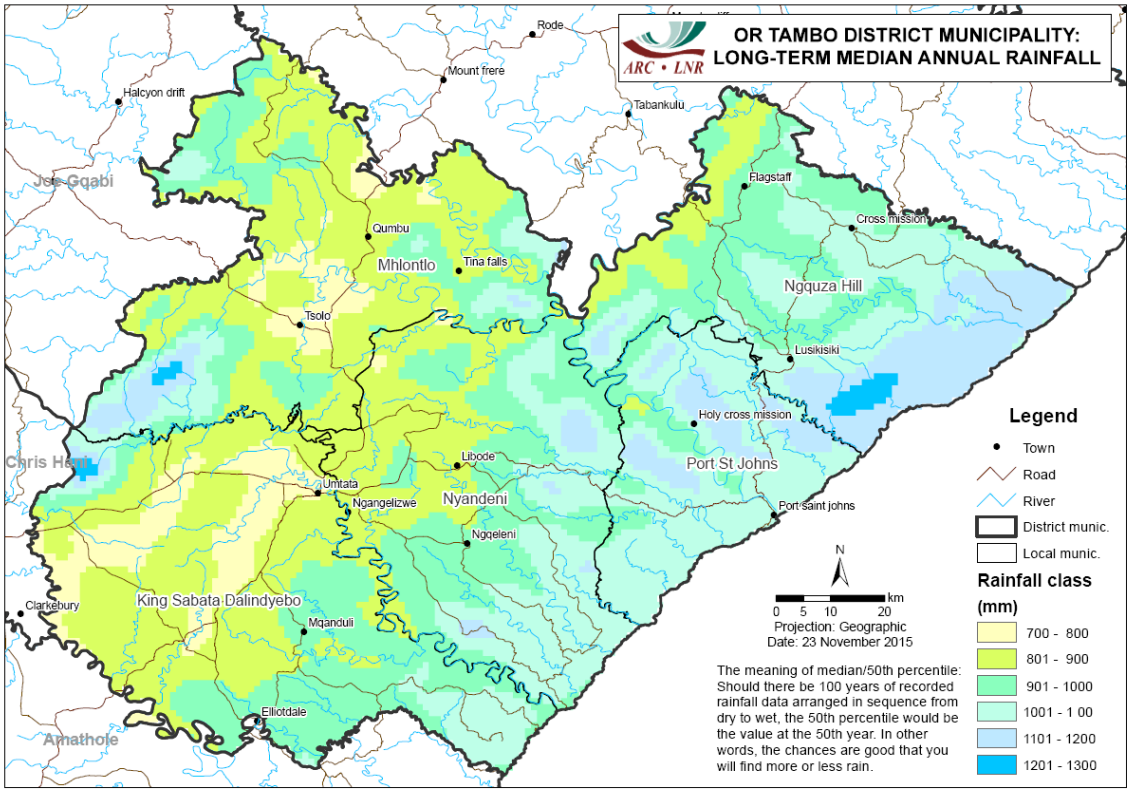
7.3.2 Rainfall, hail risk, humidity and water availability for irrigation or animal watering

Decadel (ten day period) 1km by 1km surfaces were created from rainfall data (1920 – 1999) downloaded from the AgroMet databank at the ARC-ISCW (South African Weather Service and ISCW weather stations) from stations with a recording period of 10 years or more. Regression analysis and spatial modelling were utilised taking into account topographic indices such as altitude, aspect, slope and distance to the sea during the development of the surface. Monthly averages were calculated (Malherbe & Tackrah, 2003).

The Eastern Cape is the only province in SA with potential surplus water resources with the Umzimvubu River in the O.R. Tambo and Alfred Nzo District Municipalities as the largest underdeveloped water resource in South Africa (Jordaan, 2013).

Rainfall decreases steadily inland. An appreciable amount of rain falls in the winter months in the coastal areas but inland areas receive 80% or more of their precipitation in the summer. Data from Lusikisiki and Port St Johns indicate that the area receives an average between 950 and 1250 mm of rainfall per annum (Buhmann et al., 2006) with the highest rainfall occurring in November and March and the lowest rainfall occurring in June. Most of the O.R. Tambo District Municipality receives an annual rainfall of above 900 mm. The north-eastern and western parts receives between 1100 mm and 1300 mm per annum and the inland areas between 800mm and 900 mm per annum (Map 7.5). This high annual rainfall allow for dry land crop production in most areas of the O.R. Tambo District Municipality.

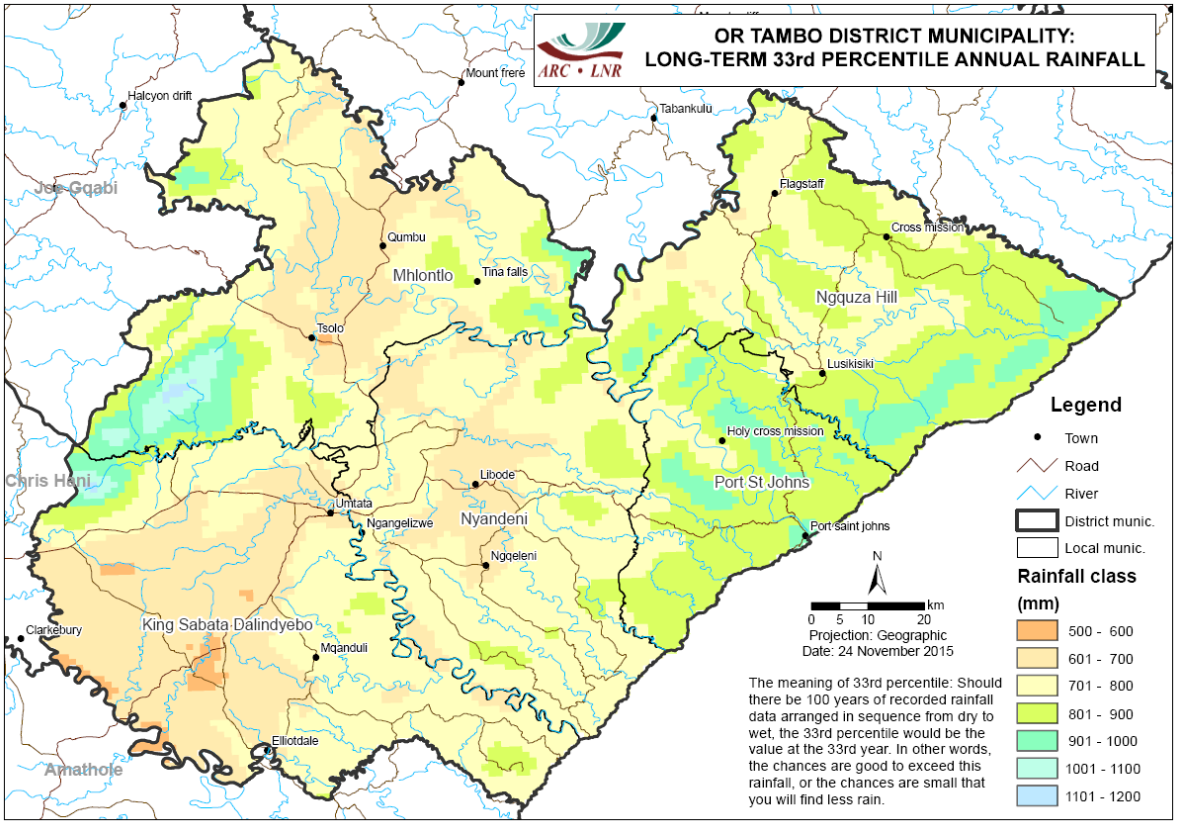
Map 7.5 - Long-Term Median Annual Rainfall



Source: Agricultural Research Council - LNR (2015)

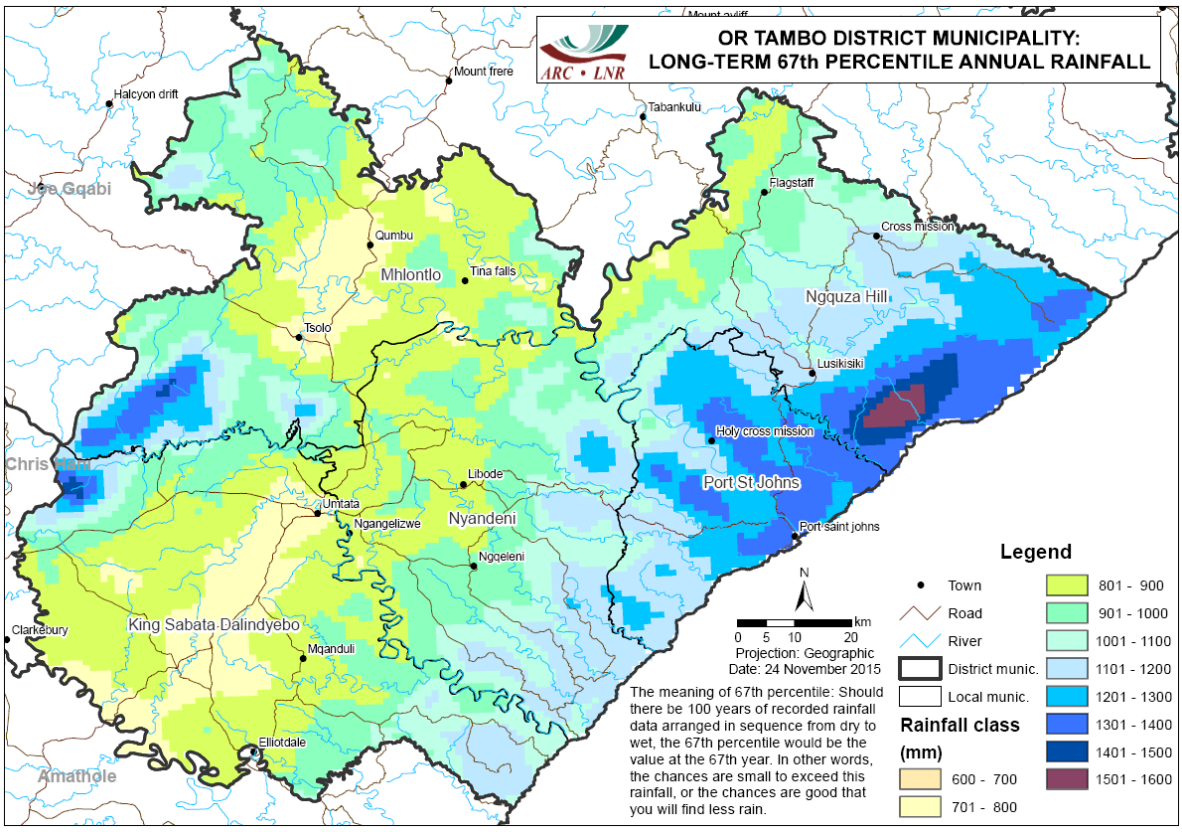
The north-eastern and western parts receives between 800 mm and 900 mm per annum and the inland areas between 600mm and 700 mm per annum even during dry summer seasons, according to the long-term-33rd percentile annual rainfall (Map 7.6). The areas southeast of Lusikisiki receive more 1500 mm annual rainfall if the long-term 67th percentile is use (Map 7.7). Supplementary irrigation is mostly only necessary optimal crop production, because of the high rainfall in the district municipality

Map 7.6 - Long-Term 33rd Percentile Annual Rainfall



Source: Agricultural Research Council - LNR (2015)

Map 7.7 - Long-Term 67 Percentile Annual Rainfall



Source: Agricultural Research Council - LNR (2015)

7.3.3 Land and Soil Resources

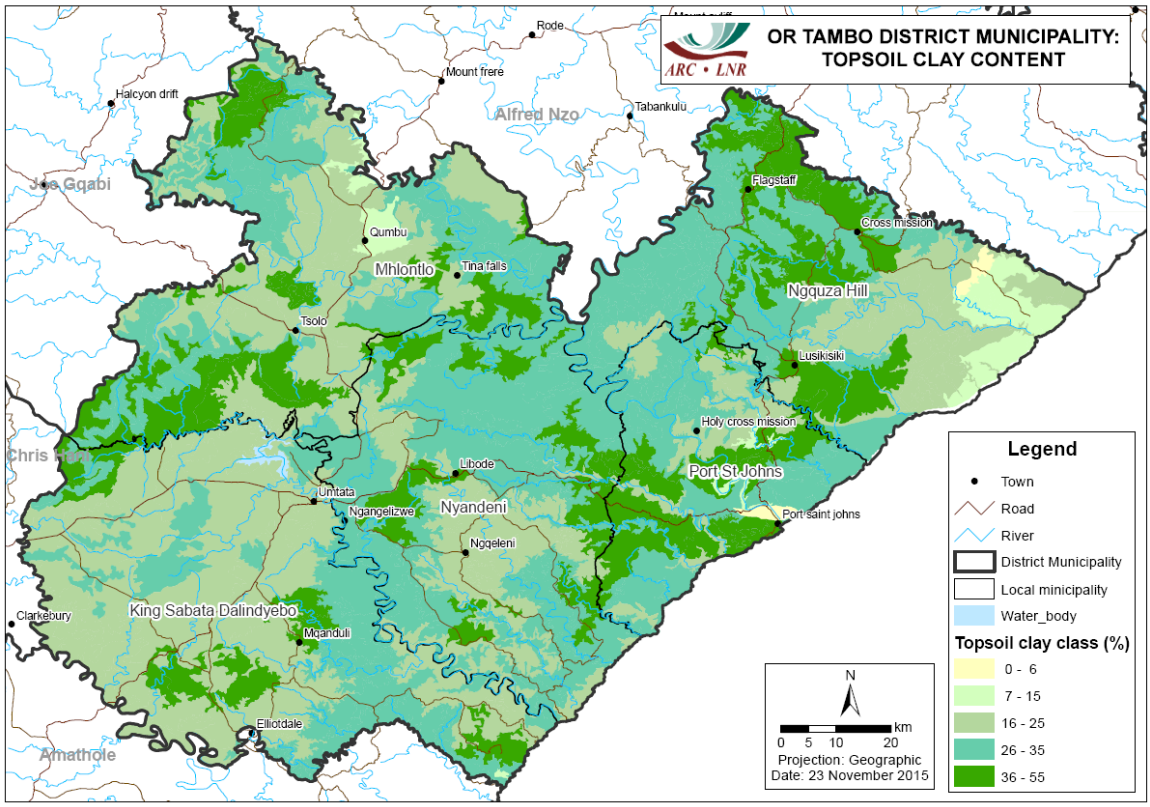
Digital Land type information and the spatial component were used to determine the top soil clay content and the soil depth. Soil depth is recorded as a range for each soil entry. A weighted average was calculated for each land type unit (Land Type Survey Staff, 1972 to 2006).

The agricultural potential of the O.R. Tambo District Municipality remains largely untapped. According to Jordaan (2013) high potential agricultural areas are found in the northern and western part of O.R. Tambo District Municipality. Agricultural activity is predominantly subsistence farming on communal land. There is potential for commercial-scale, irrigated agricultural projects. The system of communal tenure presents management challenges in the O.R. Tambo District Municipality.

The topsoil clay is mostly high, between 26 and 35% (Map 7.7) in the O.R. Tambo District Municipality, an indication of a low infiltration rate and high water-holding capacity. The majority of the area has a relatively shallow soil depth between 300 and 600 mm and even shallower in some inland areas (Map 7.8), which is extremely problematic for the production of most crops.

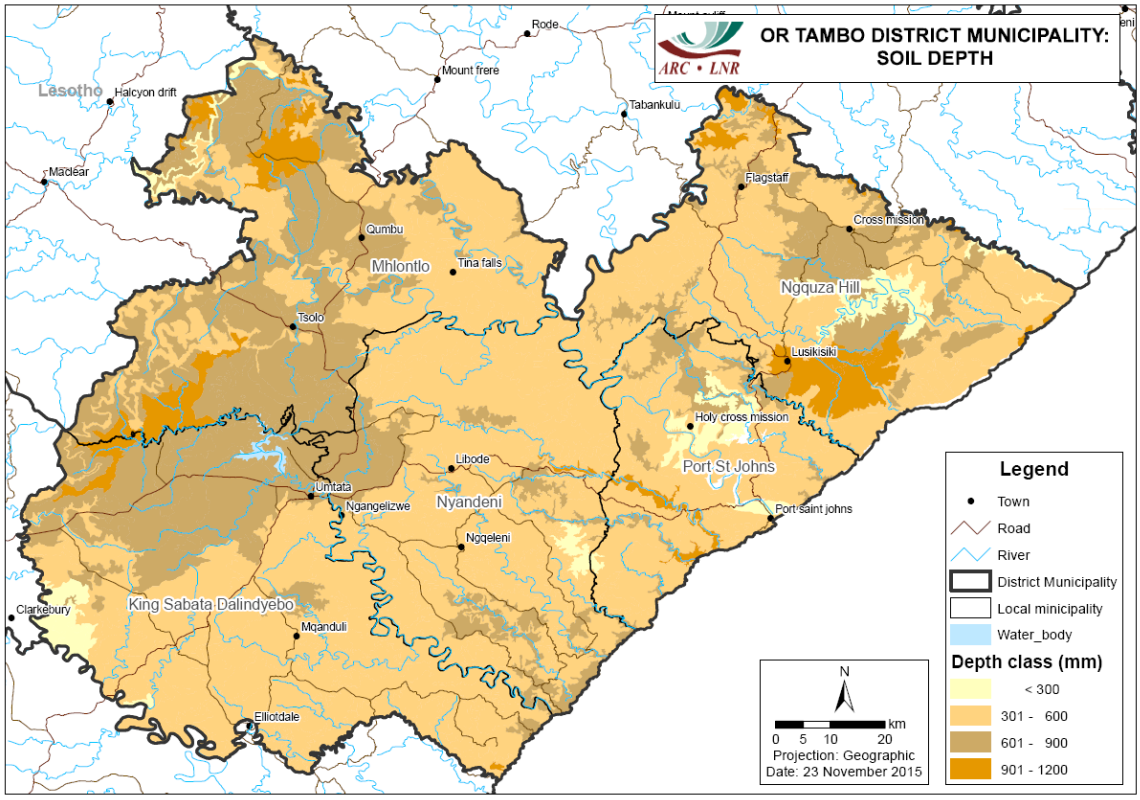
Detail soil and irrigation surveys (1:10 000 or better) are essential in the beginning of the planning stages of any agricultural projects, because of shallow soil, highly leach soils, and waterlogged soils that occur in the district municipality. Soil acidity is a major problem in the district municipality, which must be addressed before any intensive crop production project start.

Map 7.7 - O.R. Tambo District Municipality Topsoil Clay Content



Source: Agricultural Research Council - LNR (2015)

Map 7.8 - O.R. Tambo District Municipality Soil Depth



Source: Agricultural Research Council - LNR (2015)

There is potential for expansion (60 000 – 80 000 ha) of areas under forestry because of the ideal rainfall and climatic conditions, particularly in the Mzimvubu and the Pondoland. Areas (IDP ORTDM, 2014).

The degradation of the environment in O.R. Tambo District Municipality is of concern, especially the extent and severity of the soil erosion. This impacts on the economic viability and possible uses of the land. This imposes a number of limitations on the possible uses of land, and hence the economy of the area (IDP ORTDM, 2014).

7.3.4 Weed, pest and disease control

Weed, pest and disease control will differs between areas and crops within the different areas and tailor-made programs should be developed for each case study.

7.3.5 General adaptability and resilience to extreme weather and climate change

According to IDP ORTDM (2014), the Eastern Cape is expected to experience the highest temperature increases towards the northwest interior, while the lowest increases are likely along the coast. Associated with the higher temperature, will be increases in evaporation rates and increased intensity of droughts. The above climate changes could imply that O.R. Tambo District Municipality is faced with more frequent and severe flooding as a result of higher intensity storm events and possibly more frequent hail events. This will and will impact on human settlements, infrastructure, human health and place a greater burden on particularly impoverished communities. Higher rainfall may increase agricultural production but water availability could become a limiting factor, requiring increased irrigation. Ground and surface water systems are vulnerable. In this regard small-scale farming is likely to be most affected Heat waves may result in increased heat stress to plants, animals and humans and will increase associated fire risk placing livestock and grazing capacity under threat Planning for

Climate change takes on two paradigms; climate change mitigation, and climate change adaptation. Climate change mitigation involves those activities that assist in reducing the rate of change of the climate. This is a global responsibility and is aimed at limiting the generation of greenhouse gases. Climate change adaptation refers to those activities which are undertaken in response to a changing climate.

7.4 APAP Commodity Selection Criteria

The Agricultural Policy Action Plan (APAP) proposed 5 criteria for the assessment of agriculture 'sectoral interventions', referred to in this report as 'commodities'. These criteria were developed to support outcomes 4, 7 and 10 and the associated objectives set out in the New Growth Path (NGP), National Development Plan (NDP) and the Industrial Policy Action Plan (IPAP).

The 2015 – 2019 APAP report stated the following:

> "For APAP to effectively speak to Outcomes 4, 7 and 10, and to the objectives set out in the NGP, NDP and IPAP, it needs to unlock the productive potential of agriculture, forestry and fisheries by considering the nature of their binding constraints, whether these be at the level of primary production, beneficiation, or marketing, or indeed a combination of these. However, different subsectors within agriculture, forestry and fisheries operate according to different dynamics and face distinct challenges, thus there is a need to be selective as to which subsectors or value chains to focus upon in the short and medium term, while also recognising that agricultural commodities in particular are often inter-related, in which case it is more helpful to speak of 'integrated value chains'. Using the following general selection criteria, this first APAP focuses on a discrete number of value chains identified as strategic in meeting the objectives of the NGP, NDP and IPAP"

The APAP criteria are listed below:

- Contribution to food security
- Job creation
- Value of production
- Growth potential
- Potential contribution to trade balance

The above criteria were utilised to determine the Agri-Park Commodity Matrix that is presented and discussed in the next section.

7.5 Agri-Park Commodity Prioritisation Matrix

The Agri-Park project consists of several FPSU's and an Agri-Hub, as presented in Section 2. The structure of the Agri-Park enables commodities to be prioritised in areas in which they are strong, via the FPSU, and for commodities that are viable throughout the district, to provide specialised support at a district-level. The commodities that would be supported directly out of the Agri-Hub are identified via the Agri-Park commodity prioritisation matrix model that has been applied to numerous commodities, not only limited to those presented in section 7.1

In order to select and prioritise the main commodities for O.R. Tambo District Municipality, the selection matrix was designed to identify various criteria, which were weighted and prioritised based on their importance. The criteria used to select the top three commodities were as follows:

- Biophysical Criteria
- Enterprise Viability Criteria

- Economic Development Criteria
- Political/ Institutional, Social and Food Security/ Sustainability criteria

Each of these criteria, which were used to select the top commodities, were broken down into sub groups according to each of the parent criteria. They were also assigned a weight to adjust the score based on the importance of the measure on economic development within the O.R. Tambo District. The total score possible is 210, sourced from Biophysical (30), Enterprise Viability (66), Economic Development (57), and Political, social and Sustainability (57) Criteria

7.5.1 Biophysical criteria

Some of the most important criteria to consider are the biophysical criteria. If crops or livestock cannot survive in a certain area then the initiative will not be effective, hindering development and production. It is important to select crops and livestock that can cope with the biophysical environment. For example, broiler poultry are designed to flourish in very specific environments, which can be expensive to maintain outside of certain belts with the necessary temperature ranges.

- **Temperature**

  Temperature is important to consider as it, along with humidity, dictates the viability of certain crops. Certain commodities are unable to cope in extreme temperatures, and others require very specific temperature ranges to produce optimally.

  The prioritisation matrix examines the:
  - growth temperature during the months of the growing season as required by the particular crop
  - frost risk and frost sensitivity or tolerance of the crop
  - temperature ranges through the year
  - ability of the animal to cope with heat and chills

- **Water/ Moisture**

  Livestock and crops need to have sufficient water in order to support growth. Furthermore, moisture available in the air is also important, as some commodities require humid climates for best production, while others prefer dry climates. A reliable source of water or moisture either in the form of precipitation or irrigation needs to be available in order for the growth of commodity to be successful. The matrix examined the following sections with regards to water and moisture:
  - sufficient rainfall during the months of the growing season;
  - sufficient quantity of irrigation water potentially available from surface and/or groundwater resources that can be sustainably abstracted;
  - water quality for crops and animals;
  - sufficient irrigation infrastructure or schemes already available in the area;
  - sufficient quantity of water available from surface and/or groundwater resources for animal watering purposes

  An example of environments without the necessary water available is not sufficient are those experienced in a drought, which adversely affects production. Likewise, farming in a flood plain is equally ill-advised.

- **Land Type, Capability and Soil**

The soil section ascertains the quality and carrying capacity of the soil for the given commodity. It essentially determines if there are extensive patches of land covered by suitable soil in terms of:

  - Texture
  - Drainage
  - Depth

It determines the land type and potential of the crop and, given the land capability of the area, if there is enough land capable of supporting the commodity. Low scoring crops and animals may require finishing or feedlots before they are sold. Growing vegetable crops on soil that is not ideally suited for production could drain the soil of specific nutrients that are hard to replace, hurting the lands future production capabilities.

- **Weed, Pest, and Disease Resilience**

Weeds, pests, and disease resilience is an important aspect in determining the commodities that are chosen. The matrix determines the competitiveness of the crop compared to weeds, if the crop requires extensive pest and disease control, and if diseases, if any, are common in the area. In the case of livestock, the matrix examines if animals can be maintained in the area based on their resilience to pests and disease, and the vegetation is suitable for livestock production, i.e. if there is serious bush encroachment or any poisonous plants are prevalent in the area.

- **Adaptability to adverse conditions**

The commodities that are chosen need to be adaptable to adverse conditions. The biggest threats to the long term sustainability of the commodity will be climate change and associated weather conditions. The solution to this is to obtain naturalised varieties and breeds that can compete with exotic breeds and be adaptable to the threat of changing climates. For example, indigenous poultry and cattle are much more resilient to disease and climate changes than their commercialised counterparts.

7.5.2 Enterprise viability criteria

The following criteria determine the economic viability of commodity development within the O.R. Tambo District Municipality. Factors affecting the decision to produce, or not, are governed by the distance, access to, and type of market provided to, the financial determinants of production, and the human/financial capital availability of the region as well as the infrastructure requirements before production can commence.

- **Transport, Market Access and Demand Criteria**
  - Distance to Markets and Transport Costs

    The distance to the market, the type of transport and the subsequent cost of the transport are important for any commodity producer to determine before production, as they directly affect the bottom line. It is of no use to produce heavy commodities kilometres away from the nearest market, nor is it correct to produce that requires extensive care in transportation over poor roads. A good example of this is, when transporting live produce like abalone, long distances to the market over poor roads could cause production losses exceeding 30% of your transported commodity.

- Current Demand

This sub-criteria determines the current demand for the product and if it is strong or weak. It determines if there is an established market for the product, including existing marketing channels and demand amongst customers already having a strong preference for the product within the region. Finally it determines if there is a possibility of meeting additional unmet demand as the current market demand may not yet be fulfilled.

- Future Market Growth Potential

This sub-criteria determine if commodity production has room for expansion into international spheres or if it is limited to meeting local market demand, and to what extent production can expand within the local market. Not all commodities are suitable for export, nor is exportation a requirement for production. Likewise, meeting local demand is not always necessary for production. Good examples of the latter is wool and chevon production, predominantly produced for export, while examples of the former include 'live bird' poultry production for rural settlements.

- Market Openness

Not all markets are open to new producers, either due to economies of scale or to supply agreements between producers and processors. This section determines the willingness and availability of buyers at all stages of the value chain to purchase commodities from non-established producers.

- **Business strategy, payback period and profitability criteria**
  - Business strategy and positioning

This sub-criteria determines whether or not commodity production can be aligned to a viable business strategy for small-scale farmers in order to remain competitive e.g. being a low cost vs good value vs high quality vs highly differentiated producer, and various other competitive and business strategies. It also determines how well positioned the producer is to take advantage of the perceived gap in the market.

  - Payback Period

This sub-criteria determines the upfront investment required before production can being, how long this investment will take to pay back, and when the first sales will occur. This is particularly important to emerging and small-scale farmers who may not have the funds or access to funds to last a long period without a payback to the farmer e.g. forestry will have an extremely long payback period while vegetables will start earning income after the first season.

  - Profitability

This sub-criteria determines if the above production opportunities and business strategy is enough to ensure profitability, and if the producer can ensure continued production through profit-making activities.

- **Human, Physical and Financial Capital Requirements**
    - Familiarity and Local Knowledge and Skills

This sub-criteria determines if the commodity production skills are already present within the community, and how familiar they are with the skillset. It also factors into the decisions the presence of training facilities within the area, likely to increase the understanding and farming capabilities of the commodity within the community. For example, Fort Cox in Amathole District Municipality is a much used training college for the southern coastal regions of the province, and the Tsolo Agriculture College is in O.R. Tambo District Municipality.

- Labour Cost and Productivity

This sub-criteria determines the marginal cost of labour for commodity production as well as the marginal product and total production produced of labour in this region for that commodity. High costs of labour with low commodity production are unlikely to create a sustainable, efficient commodity production operation. The propensity of labourers to undergo labour action is also factored in, where applicable.

- Implements and Infrastructure

This sub-criteria ascertains the availability of and ease of access to the required commodity production tools and infrastructure.

- Ease to Finance

This sub-criteria determines the ease of obtaining financing for the commodity. It asks the question whether or not an enterprise would be able to secure funding through various means e.g. through tight value chain financing mechanisms, contract farming, equipment leasing rather than ownership etc.

7.5.3 Economic development criteria

This section focuses on the economic development likely to stem from the commodity producer's activities. "Is it likely to create jobs for the community?" and "How else can this initiative benefit the community?" are questions asked in this section.

- **Forward and Backward Economic Linkages and Agro-Processing Opportunities**
    - Forward and Backward Economic Linkages

This sub-criteria determines if there are significant economic forward and backward linkages, with the commodity, and to what extent these exist. Forward linkages are to what extent commodity production provides inputs into other agricultural activities. Backward linkages are to what extent commodity production relies on inputs from other agricultural production. A commodity with high economic linkages will be less vulnerable to changes in economy and can adapt to changes. A commodity with a high number of forward linkages is the forestry industry which has many uses for the products that are produced, while an example of an industry with backward linkages is the cattle industry, which consumes maize.

- Agro-Processing Opportunities at District Level

This sub-criteria considers the ability of the district to value add to the product being produced in the area. This includes both primary and secondary agro-processing opportunities to be exploited. These include processing opportunities to be developed at the Agri-Hub.

- **Job Creation**
  - Direct On-Farm Job Creation; and Direct, Indirect and Induced Job creation through the Value Chain

This sub-criteria explains how labour intensive commodity production is. Development in developing regions prefers labour creation than infrastructure investment for economic development. For example, banana and grape production requires seasonal labour, while commercial maize production is more capital intensive.

This sub-criteria also considers whether jobs are created or induced through the value chain and value adding processes. It is important for a commodity to contribute towards job creation throughout the regional value chain.

Job creation is measured via the use of commodity labour multipliers, measuring the number of jobs created per R1 million produced directly into commodity production. The three relevant multipliers are the:

- Direct Multiplier
  The direct multiplier measures the direct impact emanating from a particular sector on itself. For instance, the direct multiplier will measure how an increase in the production of a particular sector will affect employment within the same sector. These direct impacts are very closely related to the sector and, as such, are probably the most important impacts from a strategic planning point of view.

- Indirect Multiplier
  Indirect multipliers reflect the impacts that a particular sector will have on all other industries that supply inputs (materials) for the operations taking place in the relevant sector. These 'backward linkages' are important as they measure the broader impact that changes in the direct sector will have on the economy. Frequently, these indirect impacts are significant, and may even exceed the direct impacts themselves.

- Induced Multiplier
  Economic impacts will result from the paying out of salaries and wages to people who are employed in a particular sector, as well as the salaries and wages paid by businesses operating in the sectors indirectly linked to this sector due to the supply of inputs. These additional salaries and wages lead to an increased demand for various consumable goods that need to be supplied by various economic sectors throughout the broader economy. Clearly, these induced impacts can be considerable and are measured by using induced multipliers.

- Job Decency

This sub-criteria determines the decency of the jobs created. Job decency analyses the quality of the job that is available by the commodity production and value adding processes. Lower quality jobs include those who pay minimum wage, require little-to-no-skills with little room for advancement, and are seasonal, temporary or part-time in employment. Higher quality jobs are created when labourers are integrated into the business and management of the farm in order to create buy in and develop commodity production skills.

- **Local Development**
  - Business Opportunities, Agglomeration Effects and Job Creation at Local or District Level

This sub-criteria determines the capability of commodity production to create business opportunities and job creation within the district through value-chain expansion. For instance, small-scale cattle production within the district, sold to feedlots for value-adding, which are subsequently processed at abattoirs, sold to restaurants and retailers for consumer consumption. Each step adds to the value of the product as well as creates employment for the region.

  - Agricultural Intensification and Increased Local GDP

This sub-criteria determines if the enterprise is available to utilise a high level of agricultural intensification, and high income per surface area unit. High intensity agricultural production is preferred, as it promotes quantity per unit of production inputted. Intense agricultural production coupled with commodities that provide high-income per surface area is ideal for local economic development.

- **Global Competitiveness and Trade**
  - Global Competitiveness

This sub-criteria considers if the region is truly globally competitive, nationally competitive, or just regionally competitive to produce the commodity. If the commodity is not competitive in any of these three indicators, cheaper imports are likely to become a threat. For example, with the reinforcement of the AGOA trade treaty, poultry imports from the United States of America are likely to hinder any but the most established and efficient poultry production in South Africa.

  - Export Potential

This sub-criteria determines if the crop and its value added products have strong export potential i.e. if a commodity, once produced and/or processed, has the possibility of being exported. For example, chevon production is almost exclusively for export, with a small local market.

  - Import Substitution Potential

This sub-criteria determines if the crop or its value adding products present an opportunity to contribute to import substitution (replacing goods imported at a national or international, at local, regional or national level. For example, South Africa is a net importer of maize so any maize grown in the country would substitute any maize imported into the country.

7.5.4 Political / Institutional, social and food security / sustainability criteria

This section analyses commodity production based off of the economic, ecological and socio-economic characteristics of the district. Political factors also impact potential commodity production. Major political factors that impact production opportunities are the APAP and their highlighted commodities. Commodity production must also be able to enthuse the community, and be suitable for production on state or communal land. Food security and social criteria are also important in determining political suitability.

- **Political and Institutional Criteria**
  - Government Priority Including APAP

    This sub-criteria analyses existing agricultural policy, most recently and importantly, the APAP document. The APAP document outlines priority commodities for development in regional centres. Commodities aligning with the APAP are given greater scores on the matrix as they align to policy and can be promoted within the Agri-Park project simultaneously.

  - Existing Successful or Planned Projects

    This sub-criteria ascertains if there already projects in place in the area that farms with the commodity, or are there plans for establishment in place that are likely to be successful. Existing successful projects may indicate that the enterprise be suitable for expansion under local circumstances, and additional production may utilise existing marketing channels, infrastructure, and enabling further processing to benefit from economies of scale. For example, a poultry abattoir requires large quantities of birds to be processed, well above what any single small-scale producer can supply; however multiple small-scale producers could approach this target.

  - State or Communal Land Suitability of the Likely Business Model

    This sub-criteria determines if there are state or communal parcels of land that can be used for commodity production and how suitable they are for producing this specific commodity. Land tenure and availability is a large issue and needs to be examined in detail on a per farm basis.

- **Social Criteria**
  - Acceptability (Local “buy-in”)

    This sub-criteria considers if local farmers are willing and able to substitute their current activities for commodity production. For example, what is the opinion of farmers on maize production in cultural and tribal areas, and is it possible to convert their current production processes to more commercialised activities.

  - Income Equality

    This sub-criteria determines the flow of income within the commodity production cycle. It is more beneficial to local economic development that income is localised to the region and spread to households with lower income, than reinforcing the status of households with high income. Sustainable labour intensive practices are preferred in this instance, over capital intensive practices.

- Local Smallholder Suitability

This sub-criteria ascertains how suitable commodity production is for small-scale local farmers, particularly within rural areas near the Agri-Hub.

- Crime and Vandalism Resilience

This sub-criteria determines if the commodity and the commodity production processes and inputs are vulnerable to crime and vandalism. Theft, deliberate destruction, and arson are some of the factors considered. Stock theft is an important aspect in the Eastern Cape, vandalism of infrastructure, and arson can be detrimental to crops and crippling to forestry initiatives due to the forward investment in the commodity.

- **Food Security and Sustainability Criteria**
  - Contribution to Food Security

This sub-criteria examines the ability of the crop to contribute to national, provincial and district food security. It examined the affordability and distribution of the commodity, the contribution to biomass production, the nutrient density of the commodity, the stability throughout the year and its ability to minimise food losses. Commodities chosen should provide food security for the community, and are weighted accordingly.

  - Sustainability

This sub-criteria determines if the commodity can be sustainably produced. Sustainable production conserves the ability of the region to produce food over the long term and contributes to other social and economic services provided by the landscape. For example, crop rotation is vitally important to ensure land sustainability of production.

7.6 Prioritisation Matrix Results

The commodities that were analysed under the matrix were:

- Forestry
- Cattle (Livestock)
- Sheep (Livestock)
- Wool
- Maize
- Fruit (Fruit & Vegetables)
- Vegetables (Fruit & Vegetables)
- Aquaculture
- Tea

These commodities were chosen to best reflect existing production and current potential within the O.R. Tambo District. The results of the analysis revealed that O.R. Tambo, relative to other Eastern Cape district municipalities has an underdeveloped agricultural activities for agricultural development. The potential within the district does have characteristics that enable large-scale commercial operations in the future, based off the development of this commodity list. The individual commodity matrix is presented at the end of this section, however the top scoring commodities are Livestock (Cattle & Sheep), Fruits and Vegetables, Forestry and Maize. Aquaculture scores similarly to the above, however the isolation of the aquaculture productio, within Port St

Johns Local Municipality, prevents its inclusion as a priority district-level Agri-Hub commodity. Aquaculture, should still be included as a priority commodity for the local municipality FPSUs.

The four commodities with the highest scores were selected and are discussed below. It should be noted that the categories of “Sheep” and “Cattle” are combined in the following section as the value chains of the two are extremely similar and can be combined and supported in the Agri-Hub. They were selected as they scored the highest on the prioritisation matrix. They will be discussed according to the prioritisation matrix criteria as discussed in the chapter above. Similarly vegetables and fruit were joined, due to the similarity of their value chains in the horticulture industry. The table below indicates the top four chosen commodities as well as the list of other commodities examined for consideration.

Commodity Prioritisation Matrix Criteria	Forestry	Maize	Fruit	Vegetables	Cattle	Sheep	Wool	Aquaculture	Tea	Total
A. Biophysical criteria										
Temperature	2	2	2	2	3	3	3	3	1	3
Water/moisture	3	2	2	2	3	3	3	3	2	3
Land type, capability and soil	2	3	2	2	3	3	3	3	2	3
Weed, pest and disease resilience	2	2	2	2	2	2	2	2	2	3
Adaptability to adverse conditions	2	2	1	2	3	3	3	2	1	3
B. Enterprise viability criteria										
B.1 Transport, market access and demand										
Distance to markets and transport cost	2	1	1	1	2	2	1	1	3	3
Current demand	3	3	3	3	2	1	1	2	2	3
Future market growth potential	2	3	3	3	2	1	3	2	1	3
Market openness	2	2	3	3	2	2	3	2	1	3
B.2 Strategy, payback and profitability										
Business strategy and positioning	3	2	1	1	3	2	2	2	1	3
Payback period	1	3	1	2	2	2	2	1	1	3
Profitability	2	2	3	2	3	2	2	2	2	3
B.3 Human, physical and financial capital										
Familiarity and local knowledge/skills	2	3	1	1	3	3	2	1	3	3
Labour cost and productivity	2	2	2	2	2	2	2	2	2	3
Implements and infrastructure	2	2	2	3	2	2	2	1	2	3
Ease to finance	1	2	1	3	3	3	2	2	1	3
C. Economic development criteria										
C.1 Linkages and processing opportunities										
Forward and backward economic linkages	2	3	2	3	2	2	2	2	1	3
Processing opportunities at district level	2	2	2	2	2	2	2	1	2	3
C.2 Job creation										
Direct on-farm job creation	2	1	3	3	1	1	2	2	2	3
Indirect and induced job creation	3	2	2	2	2	1	1	1	2	3
Job quality/decency	2	1	2	2	1	1	2	1	1	3
C.3 Local development										
Local opportunities and agglomeration	2	2	2	2	2	2	2	2	2	3
Agro-intensification and local GDP growth	1	2	3	3	2	2	2	3	2	3
C.4 Global competitiveness and trade										
Global competitiveness	1	1	1	1	1	1	1	2	1	3
Export potential	1	1	1	1	1	2	3	2	2	3
Import substitution potential	2	2	2	2	2	1	1	2	2	3

Commodity Prioritisation Matrix Criteria	Forestry	Maize	Fruit	Vegetables	Cattle	Sheep	Wool	Aquaculture	Tea	Total
D. Political and social criteria										
D.1 Political and institutional issues										
Government priority including APAP	3	3	2	3	3	2	1	2	1	3
Shortlisted by the district	2	3	2	3	3	2	1	1	2	3
Existing successful or planned projects	3	2	2	2	2	2	2	2	3	3
State/communal land suitability	3	3	2	2	2	2	2	1	3	3
D.2 Social issues										
Acceptability (Local "buy-in")	1	2	1	2	2	2	1	2	2	3
Income equality	2	1	2	2	2	2	2	2	1	3
Local smallholder suitability	2	3	2	2	3	3	2	2	2	3
Crime and vandalism resilience	1	1	1	1	1	1	1	2	1	3
D.3 Food security and sustainability										
Contribution to food security	1	2	2	3	2	1	1	3	1	3
Sustainability	3	2	2	2	2	2	2	2	2	3
Sub-totals										
Biophysical total	**23**	**22**	**19**	**20**	**29**	**29**	**29**	**28**	**16**	**30**
Enterprise viability total	**46**	**49**	**43**	**46**	**53**	**43**	**41**	**37**	**41**	**66**
Economic development total	**33**	**32**	**35**	**36**	**31**	**29**	**33**	**34**	**33**	**57**
Political and social total	**37**	**42**	**35**	**44**	**44**	**37**	**28**	**38**	**31**	**57**
Overall total	**139**	**145**	**132**	**146**	**157**	**138**	**131**	**137**	**121**	**210**

7.6.1 Livestock (Sheep and Cattle)

The two commodities that combined to form the livestock commodity, feeding into the red meat industry, are separated in the commodity matrix due to their notably divergent markets. The first, cattle, serve multiple purposes within the O.R. Tambo economy, produced for local consumption. Goats, on the other hand, while serving marginally to supplement local consumption by providing milk, cheese and to a lesser extent, meat, also enable access into the export environment, specifically in Southern Africa. There are still similarities between the two, and they will be discussed together as well as sheep.

O.R. Tambo District Municipality is well suited for livestock production with both cattle and sheep scoring extremely well, with 29 of the possible 30 points. The temperature is moderate enough to encourage good livestock production. The adaptable nature of the sheep, goats and cattle prevalent within the region, the Nguni cattle specifically, enables high adaptability to the ecological conditions and diseases within the district.

Enterprise viability is where the two commodities diverge slightly. With the local goat market demand significantly lower than cattle, and future market growth directly linked to a multitude of factors within the

export market. Alternatively, the commodities possess similarities to each other with respect to transport and market access. Both markets are relatively open, with demand more limited by substitute production, predominantly white meat, than any constraints within their own market, and both commodities are positioned in similar areas, with similar distances to the market, or in this case, the processing facilities at Mthatha.

The strategies open for livestock development are, relative to other commodities within the district, strong for cattle development. Cattle is a popular symbol of wealth in the culture of the region (See 7.2), and due to the strengths of the breed is extremely viable for production locally, and a guaranteed market in the local red meat consumer's demand. Sheep production as with cattle production is extremely viable for production locally, and a guaranteed market in the local red meat consumer's demand.

Livestock in O.R. Tambo District Municipality have been a common feature for a number of years, with the local community familiar with techniques in raising cattle and sheep, however modern and efficient production techniques are not in use within the district, as a result of the extensive subsistence farming occurring. Likewise, commodity development infrastructure within the district, while existing within some form, is not extensively developed for livestock. Livestock in the district is also fairly open to local opportunities and agro-intensification via agglomeration opportunities, and exposure to feedlots.

Forward and backward linkages within the livestock industry exist, in that livestock are provided with fodder from agricultural production, especially at feedlots, while also supplying fertiliser inputs back towards the crop, fruit and vegetable commodity markets. Processing opportunities exist within the region as there is only one medium-scale abattoir servicing the district in Mthatha, with numerous small butcheries scattered throughout the district.

Livestock farming is not labour intensive at small-scale production, however, the cattle commodity specifically does have an extensive value chain with job opportunities at production, processing, retailing and service level. The direct employment multiplier, is relatively low, with only 2.07 jobs created per million produced. The indirect multiplier is likewise low, at 1.61 jobs, and the induced multiplier is only 1.88 jobs (OABS Development, 2015).

Cattle and sheep production supplies the local market, serving as a substitute for poultry imports, lamb, pork and locally produced white meat. Alternatively, wool production from sheep, is primarily an export product, with low global but high Southern Africa competitiveness, seeking to supply the Asian markets.

Political and social criteria for livestock scored strongly, based off the requirements of the APAP and the strong ability to develop livestock in the region is promising based off political directives, agricultural policy documents, and the existing trends of production in the district. The community is not expected to need to adapt to livestock production, as it has a commercial and cultural history within the district with the local smallholder producers. Crime is a problem for livestock, with livestock at risk of theft throughout the district. Finally, both commodities can contribute to food security in certain ways, with goats seeing as a less favourable option, post production. Livestock, based off of the matrix results can be seen as sustainable in the district.

7.6.2 Vegetables & Fruit

Vegetables scored the second highest on the prioritisation matrix. Due to the diverse nature of the commodity, with different types of vegetables suited to different climates, vegetables are suitable for production across the other ecological factors within the O.R. Tambo district.

Vegetable production within the district is expected to occur primarily within remote areas as a form of subsistence farming, with excess sold off as commercial output. As such, the distance to accessible markets is poor. However, due to the commodity's position as a staple food in population diet, the current demand and future market growth opportunities are quite high. The vegetable market is relatively open, as production is able to be integrated into the market via consolidated processing facilities, street-side vendors, and supply agreements with retailers.

The district does not have a strong history of commercial vegetable production, with a direct impact on the capability of producers to develop sound business strategies without intensive assistance. This is further compounded by the necessary crop rotation that must occur to prevent soil exhaustion. In a more positive position, the payback period for vegetables is relatively short, with income received after the first harvest, and profitability is high, especially with high-value 'money' crops.

Vegetable production within the O.R. Tambo District Municipality is more labour intensive than capital intensive with farming implements relatively easy to source on a small-scale. As production ramps up to commercialised activities, the implements and infrastructure become harder to obtain. Vegetables are relatively easy to finance, due to the straightforward nature of production, the short list of requirements for production, and the political support present within the district for the commodity.

Vegetable production incorporates several forward and backward linkages, with production waste serving as animal feed in some communities, while fertiliser is sourced from animal excrement, especially in small communities. Processing opportunities at a district level for vegetables include washing, packing and transporting, with more intense value-adding processes unlikely to be viable early on in the production process. Vegetables require substantial seasonal labour activities, especially during harvesting and planting, increasing substantially as the scale of production shifts from small to large-scale production. Indirect job creation via the washing, packaging and transport is limited, and job quality in the primary production process can be expected to be adequate. As a result the direct employment multiplier is 2.49 jobs created per million produced. The indirect multiplier is at 1.37 jobs. The induced multiplier is 1.89 jobs (OABS Development, 2015).

Agglomeration opportunities exist for local subsistence producers, as do agro-intensification opportunities, should the commodity production prove successful, due to the high-value nature of the crops and the subsistence nature of producers in the district. The district is not expected to export any vegetable production, nor be globally competitive in the current small-scale environment envisioned for the region, however the commodity will serve to substitute national and provincial imports into the district.

Vegetables are prioritised at a political level for the country, province and district through the APAP document. Existing successful operations are small-scale, however the opportunity for using state land for production expansion exists. Vegetables are an accepted commodity within the district with subsistence farmers suiting their own needs, and are a commodity that local smallholder producers can produce. Vegetable production also has the opportunity, when done in sufficient scale to promote income equality. However, crime in the district is a problem, with vandalised and/or poorly maintained fencing serving as a detriment if livestock enter the production area. Finally, vegetables have a high contribution to food security, and, ensuring efficient and effective crop rotation, are sustainable for continued production.

Fruit production is linked to vegetable production as the storage, processing and transporting requirements are similar, enabling extra opportunities for production. Fruit commodity production exhibits similar results to vegetable commodity production within the matrix. The differences occur within the adaptability of fruit to the O.R. Tambo District Municipality climate, with only the coastal regions, specifically Port St Johns Local Municipality suited for large-scale fruit production, the payback period being significantly longer due to maturing of the plants, the ease to finance being more complicated, less forward and backward linkages, less political mention in policy documents for the region, and uncertainty over whether the local residents will be willing to engage in fruit production. Finally, training within fruit commodity production is scarce within the region, with specialised skillsets, implements and infrastructure required for certain crops, like bananas.

7.6.3 Maize

Maize production is well suited for production in the O.R. Tambo District Municipality, with adequate land and sufficient rainfall. The land type suits maize production, with the crop adequately suited for production in the district.

Maize, primarily yellow maize, is produced as a subsistence good throughout the district, with the distance to market understandably poor, due to the scattered nature of production. It is in high demand within nationally, however traditionally is a popular household food staple. White maize is also used for within the country as a diet staple. Future market growth can be expected to be high, especially with recent production periods nationally being low, and agricultural regions suffering under drought conditions in 2015. The market is somewhat open, with consumers able to interact with maize in various aspects, from raw to processed form.

Maize business strategy is poor within the district, with opportunities for rapid advancement and production technique improvement. The maize production within the district is governed by traditional and cultural customs, with products of the homestead traditionally required to return to the homestead before any surplus is traded. Maize has a relatively short payback period, with income expected after the first harvest, and depending on the quantity entering the market post-harvest, and should receive moderate profits. The district communities are familiar with maize production, from both a current subsistence and historical production context. Labour cost can be expected to be relatively low, with production per labourer at an adequate level. Small-scale production requires a small to medium investments in infrastructure and farming implements, while large-scale operations would require significant investments for planting, harvesting, storage and potentially processing. Maize is easy to finance, however the lack of large-scale initiatives currently active within the district hinder financing operations

Maize has substantial potential forward and backward linkages within the O.R. Tambo District Municipality agricultural economy. Forward linkages include suppling feed to livestock, both as a product as the remains of the field after harvesting, although this latter occurs in small-scale subsistence operations primarily, while backward linkages include utilising fertiliser from livestock for increasing and improving soil quality. Maize also possesses numerous processing opportunities, as feed pellets at feedlots, and in the case of white maize, as flour and bakery production. There is low to moderate on-farm job creation due to the nature of the production in the district. Small-scale production is not excessively labour intensive and large-scale production is highly mechanised. Indirect job creation depends highly on the type of maize produced, with yellow maize having substantially less job opportunities within the value chain, to feed pellets, than white maize does through to flour, cornbread and other baked goods. As a result the direct employment multiplier is high, for the district, with 3.49 jobs created per million produced. The indirect multiplier is, low, at 1.34 jobs. The induced multiplier is 1.91 jobs (OABS Development, 2015).

Maize production within the district is limited in scope, but not in potential. Current product within the district is subsistence in nature, with good potential for agglomeration of production, with multiple small-scale farmers working to produce on the same land. However, cultural traditions within the district serve as a deterrent for this type of behaviour. Alternatively, there are also several opportunities for large-scale production, to occur on communal land that could inject significant investment into the commodity within the region. Similarly there are opportunities for agro-intensification and local GDP growth, but they would require producer households to trade directly with the market post production.

Politically, maize is promoted at a national, provincial and district level for development within O.R. Tambo District Municipality. Successful initiatives do exist, however they are predominantly small-scale producers. Maize is a suitable commodity for development on communal land, however the opportunity cost of using this land would be to find alternative grazing areas for existing livestock populations. Maize has the local buy-in from the communities and is an excellent commodity for production by local smallholders. Subsistence maize farming does little to alleviate income inequalities within the district, and will remain to do so until the community mind set regarding maize production is changed. Crime is a problem with maize production, and poor maintenance or vandalism of fences can destroy a crop as neighbouring livestock graze on the plant. Maize contributes towards food security, however would need to be produced in greater quantities to contribute substantially to regional food security. Maize is sustainable as a crop, however proper techniques would need to be implemented to guarantee future production quantities.

As per the profile of the ECRDA maize has been identified as a key commodity, promoted by the agency at Regional Economic Development (RED) Hubs within the district, located at Lambasi and Mqanduli.

7.6.4 Forestry

The O.R. Tambo District Municipality is climatically well suited for forestry production, with the biophysical conditions providing the ground for medium- to large-scale production opportunities. There is excellent water supply available in the district for forestry, with adequate environmental conditions to promote forestry growth.

The forestry market is well established with major processors located near existing forestry production zones, and a healthy demand from within the region for furniture, housing and other construction. There is adequate future market growth expected within the district, and the presence of large suppliers serve as a hindrance to market openness; however not so much as to discourage small-scale production of timber for those demanding semi-processed products. The commodity business strategy is well developed, with numerous small-scale producers, support organisation and even large-scale producers in operation in the province. The commodity payback period is extremely poor, with investments required two decades in advance, in some cases, before income can be received. The profitability of the sector is variable, with two different income streams via the processed and semi-processed markets.

The district is familiar with forestry projects, with communities such as Langeni assisting large producers in accessing communal land. Forestry can be a labour intensive process, with labourers required to cut trees, and provide small-scale value-adding, although it can also be capital intensive in largescale operations. Likewise, small-scale operations require implement investment, but minimal infrastructure investment, while large-scale operations require significant investment into infrastructure and facilities as well. It is not an easy industry to finance.

There are certain opportunities where forestry can contribute to forward linkages in agricultural production, predominantly involving construction and tool manufacture. There are opportunities for semi-processing within the district, expanding upon existing supply and un-processed timber to cater for the regional construction

market. There are multiple areas in which jobs can be created within the forestry commodity, especially in on-site processing opportunities, like charcoal. These also contribute towards indirect jobs created as well as those in the construction and furniture industries based on the increased availability of timber.

Forestry production is the least labour intensive of the four commodities reviewed. The direct employment multiplier is the lowest in the district at 1.48 jobs created per million invested. The indirect multiplier is, also low, at 1.61 jobs. The induced multiplier is 2.32 jobs, the highest for the district (OABS Development, 2015).

The commodity is not expected to be globally competitive, nor expect to export production outside of the Eastern Cape. There will be minor import substitution, swapping products imported into the province from around South Africa to product of local manufacture.

Politically, forestry is well supported at both a provincial and district level, with direct mention for development by the APAP. There is large-scale production occurring within the district in King Sabatha Dalindyebo Local Municipality. The district community is expected to require encouragement (i.e. financial, training, infrastructure, etc.) to produce the commodity, and increase production, however it is a product that can promote income equality and be produced by local smallholders. It is very sustainable as a product in the region, however it does not contribute to food security, and it is extremely susceptible to arson, droughts, and floods (with saplings).

7.7 Summary

Based on the above discussion on the outcomes of the prioritisation matrix it is clear that Red Meat, Vegetables & Fruit, Maize and Forestry are the four agricultural commodities that should form the key focus of the Lambasi Agri-Park. Chapters 8 - 11 follow with in-depth discussions of these four commodities.

Red Meat

Chapter 8

8. LIVESTOCK / RED MEAT

8.1 Commodity Assessment

The following commodity assessment builds upon the livestock commodity identified within the previous chapter. As per the outcomes of the commodity prioritisation matrix, livestock (cattle, sheep and goats) have been identified for development. Both these commodities feed into the red meat industry/market.

The South African red meat market covers several commodities, most important to the local market being: beef (cattle), lamb (sheep), chevon (goat) and pork (pig).

8.2 Global Markets

Global red meat production was 191 million tons (including beef, pork, mutton and chevon) in 2013. With red meat production per region as follows:

- Asia 87 million tons (45.5%).
- North America 25 million tons (13.3%).
- Central America 4 million tons (2.3%).
- South America 21 million tons (11.2%).
- Europe 39 million tons (20.2%).
- Africa 10 million tons (5.2%).
- Oceania 5 million tons (2.4%).

Table 8.2 provides global livestock production figures by region and heads of stock for 2013. African livestock producers are a significant contributor to global mutton and chevon production, statistics that are provided in more detail in Table 8.1. The main global regional producers of beef are South America and Asia. Whilst the main pork producer globally is Asia.

South Africa leads Southern Africa production, producing 1.2 million tons of red meat, or 12.5% of Africa's total.

Other notable producers of red meat across the continent are Ethiopia (5.0%), Egypt (6.0%), and Nigeria (11.3%), with these three countries contributing 31.5% of Africa's total population. In Table 8.3 and Table 8.4 the production of red meat in South Africa is compared to neighbouring trading partners in SADC, namely Botswana, Lesotho, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe.

South Africa is a major red meat producer within SADC, dwarfing its neighbours in terms of beef, mutton, and total production. Mozambique produces a relatively large amount of pork, almost 10% of the African total. Southern African chevon production is relatively small compared to its production of other red meat products. The African continent is the 2nd largest producer of chevon globally, behind Asia, and chevon produced within South Africa is primarily for the export market.

Table 8.1 - Global Red Meat Production (2013)

	Beef		Pork		Mutton		Chevon		Total	
	(Tons)	% of Total	(Tons)	% of Total	(Tons)	% of Total	(Tons)	% of Total	(Tons)	% of Total
Africa	**5 694 271**	**8,9%**	**1 304 128**	**1,2%**	**1 687 934**	**19,7%**	**1 301 339**	**24,2%**	**9 987 672**	**5,2%**
Asia	14 373 105	22,5%	64 448 557	57,0%	4 254 075	49,5%	3 805 643	70,8%	86 881 380	45,5%
Europe	10 140 072	15,8%	27 121 641	24,0%	1 130 148	13,2%	112 260	2,1%	38 504 121	20,2%
North America	12 754 389	19,9%	12 486 933	11,0%	90 280	1,1%	2	0,0%	25 331 604	13,3%
Central America	2 502 264	3,9%	1 804 085	1,6%	74 155	0,9%	52 342	1,0%	4 432 846	2,3%
South America	15 617 999	24,4%	5 371 205	4,8%	242 076	2,8%	73 491	1,4%	21 304 771	11,2%
Oceania	2 901 429	4,5%	498 264	0,4%	1 110 589	12,9%	27 329	0,5%	4 537 611	2,4%
World	**63 983 529**	**100,0%**	**113 034 814**	**100,0%**	**8 589 257**	**100,0%**	**5 372 407**	**100,0%**	**190 980 007**	**100,0%**

Source: FOASTAT (2015)

Table 8.2 - Global Livestock Populations (2013)

	Cattle		Pigs		Sheep		Goat		Total	
	Heads of Cattle	% of Total	Heads of Pigs	% of Total	Heads of Sheep	% of Total	Heads of Goat	% of Total	Heads of Livestock	% of Total
Africa	**304 746 910**	**20,8%**	**35 732 880**	**3,7%**	**328 450 262**	**28,2%**	**347 957 726**	**35,7%**	**1 016 887 778**	**22,2%**
Asia	494 982 171	33,7%	589 902 648	60,4%	511 796 697	44,0%	571 051 689	58,5%	2 167 733 205	47,3%
Europe	122 048 722	8,3%	184 006 466	18,8%	129 945 891	11,2%	16 527 388	1,7%	452 528 467	9,9%
North America	101 515 311	6,9%	77 654 800	7,9%	6 246 750	0,5%	2 841 350	0,3%	188 258 211	4,1%
Central America	55 632 189	3,8%	24 735 788	2,5%	11 744 464	1,0%	12 367 813	1,3%	104 480 254	2,3%
South America	348 401 875	23,7%	60 060 193	6,1%	68 340 324	5,9%	21 096 760	2,2%	497 899 152	10,9%
Oceania	40 221 546	2,7%	5 181 471	0,5%	106 351 147	9,1%	3 960 537	0,4%	155 714 701	3,4%
World	**1 467 548 724**	**100.0%**	**977 274 246**	**100.0%**	**1 162 875 535**	**100.0%**	**975 803 263**	**100.0%**	**4 583 501 768**	**100,0%**

Source: FOASTAT (2015)

Table 8.3 - African Red Meat Production (2013)

	Beef		Pork		Mutton		Chevon		Total	
	(Tons)	% of Total	(Tons)	% of Total	(Tons)	% of Total	(Tons)	% of Total	(Tons)	% of Total
South Africa	**851 000**	**14,9%**	**216 000**	**16,6%**	**143 750**	**8,5%**	**35 450**	**2,7%**	**1 246 200**	**12,5%**
Botswana	47 000	0,8%	500	0,0%	1 876	0,1%	5 760	0,4%	55 136	0,6%
Lesotho	13 500	0,2%	3 700	0,3%	4 250	0,3%	2 240	0,2%	23 690	0,2%
Mozambique	25 500	0,4%	129 600	9,9%	1 008	0,1%	22 200	1,7%	178 308	1,8%
Namibia	35 800	0,6%	4 675	0,4%	13 200	0,8%	3 840	0,3%	57 515	0,6%
Swaziland	17 100	0,3%	1 310	0,1%	526	0,0%	1 782	0,1%	20 718	0,2%
Zambia	197 827	3,5%	35 244	2,7%	882	0,1%	9 000	0,7%	242 953	2,4%
Zimbabwe	103 750	1,8%	31 900	2,4%	448	0,0%	13 200	1,0%	149 298	1,5%
Africa	**5 694 271**	**100,0%**	**1 304 128**	**100,0%**	**1 687 934**	**100,0%**	**1 301 339**	**100,0%**	**9 987 672**	**100,0%**

Source: FOASTAT (2015)

Table 8.4 - African Livestock Populations (2013)

	Cattle		Pigs		Sheep		Goat		Total	
	Heads of Cattle	% of Total	Heads of Pigs	% of Total	Heads of Sheep	% of Total	Heads of Goat	% of Total	Total	% of Total
South Africa	**14 000 000**	**4,6%**	**1 600 000**	**4,5%**	**25 000 000**	**7,6%**	**6 200 000**	**1,8%**	**46 800 000**	**4,6%**
Botswana	2 500 000	0,8%	13 500	0,0%	290 000	0,1%	1 700 000	0,5%	4 503 500	0,4%
Lesotho	665 000	0,2%	81 000	0,2%	1 230 000	0,4%	850 000	0,2%	2 826 000	0,3%
Mozambique	1 690 000	0,6%	1 800 000	5,0%	250 000	0,1%	4 350 000	1,3%	8 090 000	0,8%
Namibia	2 370 000	0,8%	72 500	0,2%	2 930 000	0,9%	2 235 000	0,6%	7 607 500	0,7%
Swaziland	635 000	0,2%	35 000	0,1%	36 000	0,0%	270 000	0,1%	976 000	0,1%
Zambia	4 026 658	1,3%	1 098 951	3,1%	240 000	0,1%	2 500 000	0,7%	7 865 609	0,8%
Zimbabwe	5 150 000	1,7%	650 000	1,8%	375 000	0,1%	2 750 000	0,8%	8 925 000	0,9%
Africa	**304 746 910**	**100.0%**	**35 732 880**	**100.0%**	**328 450 262**	**100.0%**	**347 957 726**	**100.0%**	**1 016 887 778**	**100,0%**

Source: FOASTAT (2015)

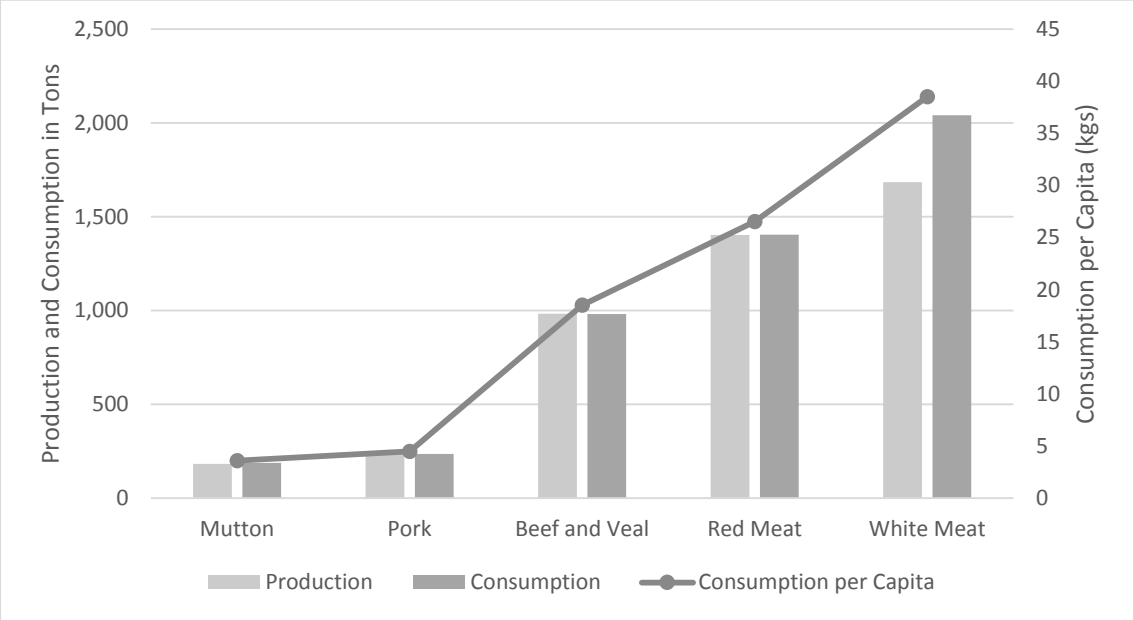
8.3 National Market

The South African red meat industry is well established and remains one of the most important agricultural sub-sectors in the country. It contributed approximately 14.0% to the gross value of agricultural production in the SA during 2013/14. It is estimated that the total number of cattle, pigs and sheep slaughtered increased by 9.5%, 3.1% and 11.2% respectively from 2012/13 to 2013/14.

The cattle and calves slaughtered market earned R 25.449 billion between April 2014 and March 2015, with the sheep slaughtered market earning R6.008 billion over the same period. In comparison, poultry meat earned R35.573 billion, and the animal product market as a whole earned R105.420 billion.

South African red meat production is largely in line with red meat consumption, with the short fall imported into the country. This is presented graphically in Figure 8.1. In recent years, the quantity of red meat imported for consumption has been on the decline, especially in the 2013/14. Mutton imports have declined over the 10 year period from 34 800 tons to a mere 7 100 tons, while beef imports have likewise dropped considerably from 56 000 tons to 20 000 tons. Pork import figures were unavailable, however South Africa produced 300 tons more pork than was consumed in 2013/2014. Imports of red meat decreased from 43 120 tons in 2012/13 to 23 010 tons in 2013/14, a decrease of 46.6%.

Figure 8.1 - South African Red Meat Production, Consumption and Consumption/Capita, 2013/14



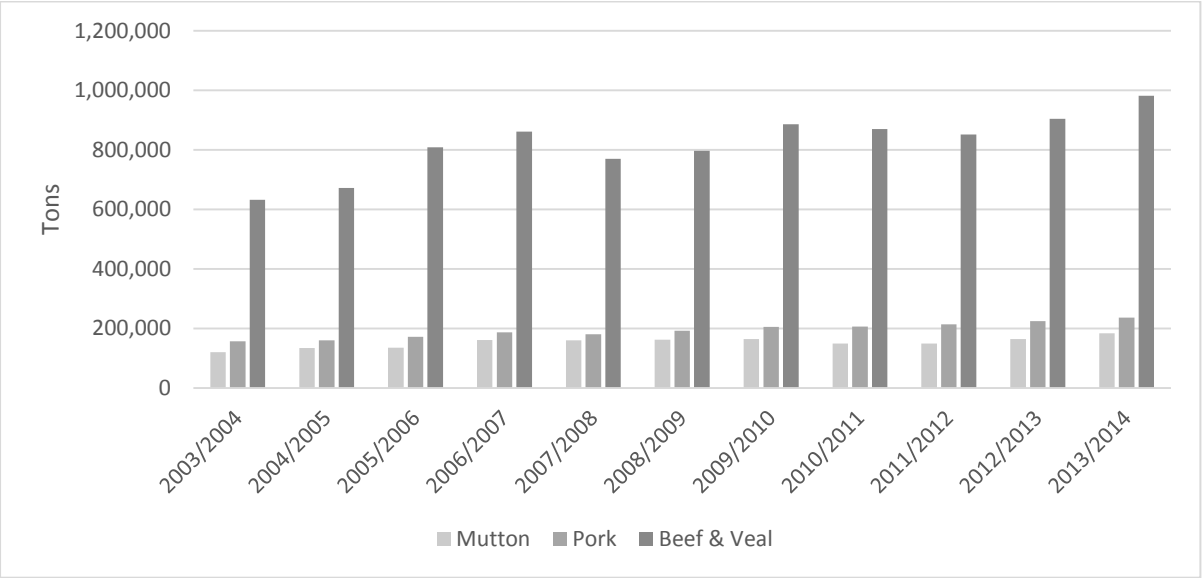
Source: DAFF (2015A)

8.4 Production

Figure 8.2 illustrates the growth in production of beef, pork and mutton[1] since the 2003/04 season. Red meat production has increased steadily year on year over the 2003/04-2013/14 period, with mutton production increasing by 52.5%, pork production increasing by 50.7%, and beef & veal production increasing by 55.5%.

[1] Chevon, while produced within the country, is primarily for export and is not included in the statistics for consumption and production. Goat populations peaked in 1987, with 2 989 000 goats in the country, and has since been on a general decline, with average annual growth of goat herds between 2005 and 2014 as low as -0.7%. Goat herds have dropped below 2 million animals in 2014, to 1.987 million, the lowest value in the provided record (1980 to 2014).

Figure 8.2 - South African Red Meat Production, 2003/04 – 2013/14



Source: DAFF (2015A)

8.4.1 Production by Province

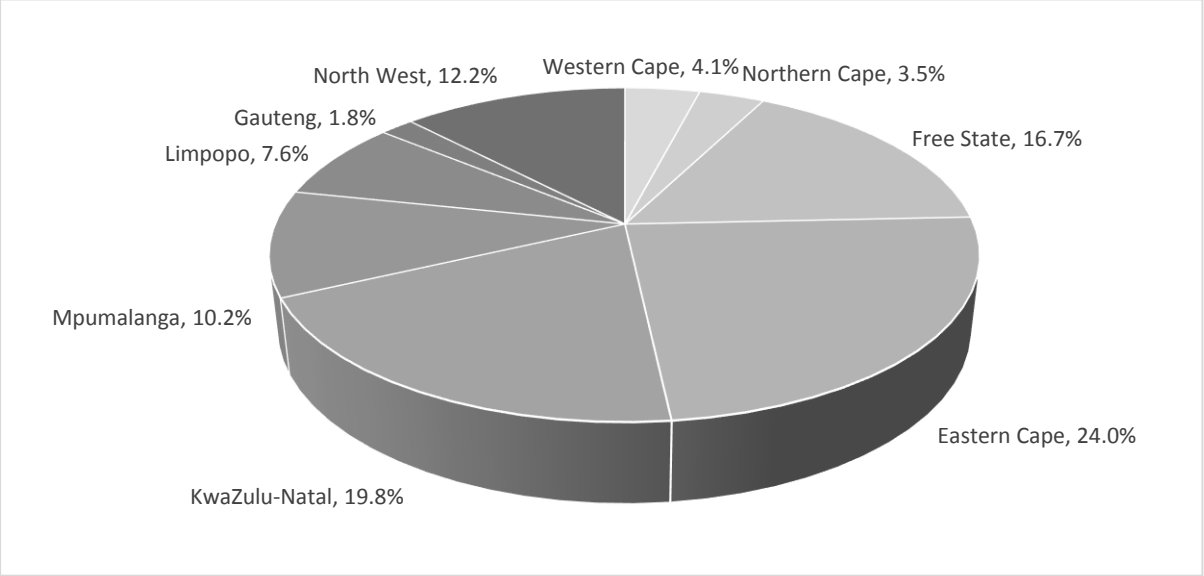
Major production of certain livestock is concentrated in certain provinces, and the provincial production dynamics are discussed in this section.

- Cattle

Cattle populations are found throughout the country, but predominantly within the Eastern Cape (24.0%), KwaZulu-Natal (19.8%), Free State (16.7%) and North West (12.2%) provinces. Herd sizes vary according to type of cattle. Beef cattle herds range from fairly small herds of less than 20 heads of cattle, to large farms and feedlots environments with well over 1 head of cattle. The production of weaners for the feedlot industry is the most frequent form of cattle farming in South Africa, such that feedlots account for approximately 75% of all beef produced in the country.

The total number of cattle in South Africa at the end of August 2014 is estimated at 13.81 million, comprising various international dairy and beef cattle breeds as well as indigenous breeds such as the Afrikaner and the Nguni. Beef cattle contribute approximately 80% of the total number of cattle in the country, translating into an estimated 11.04 million animals, while dairy cattle make up the remaining 20%. The complete breakdown can be seen in Figure 8.3.

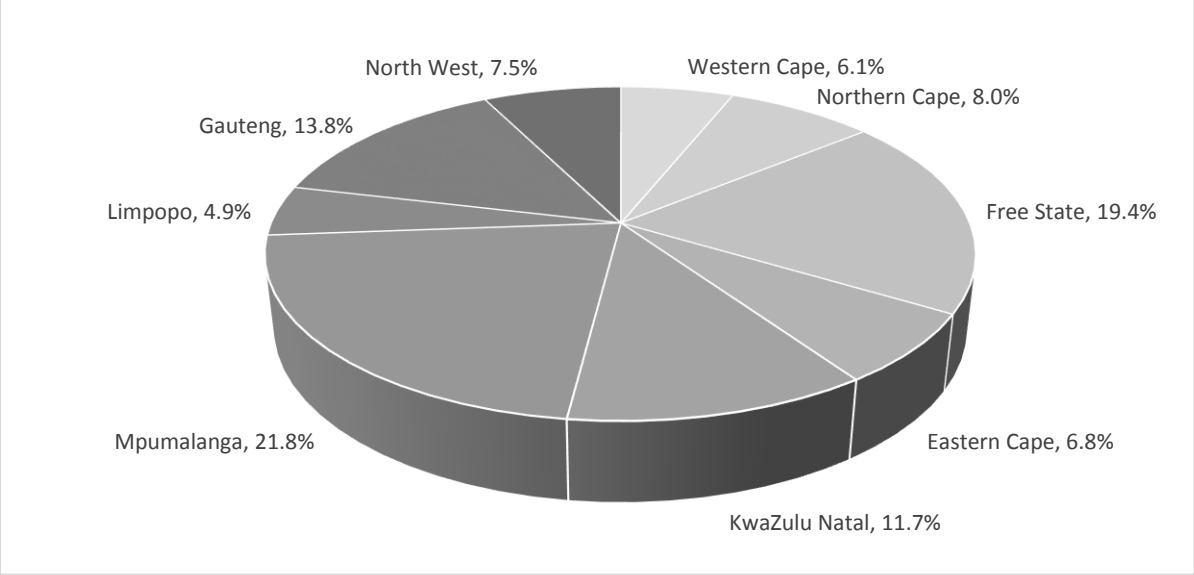
Figure 8.3 - Distribution of Cattle by Province, 2014



Source: DAFF (2015C)

In terms of production, 2.707 million cattle were slaughtered in the 2014 season, with the 1.116 million of these slaughtered in Mpumalanga and Free State. Cattle slaughtering statistics, when compared to those of sheep and pigs indicate that the slaughtering of cattle is shared somewhat evenly, especially when compared to sheep, between provinces. The provincial breakdown can be seen in Figure 8.4.

Figure 8.4 - Slaughtering of Cattle by Province, 2013/14

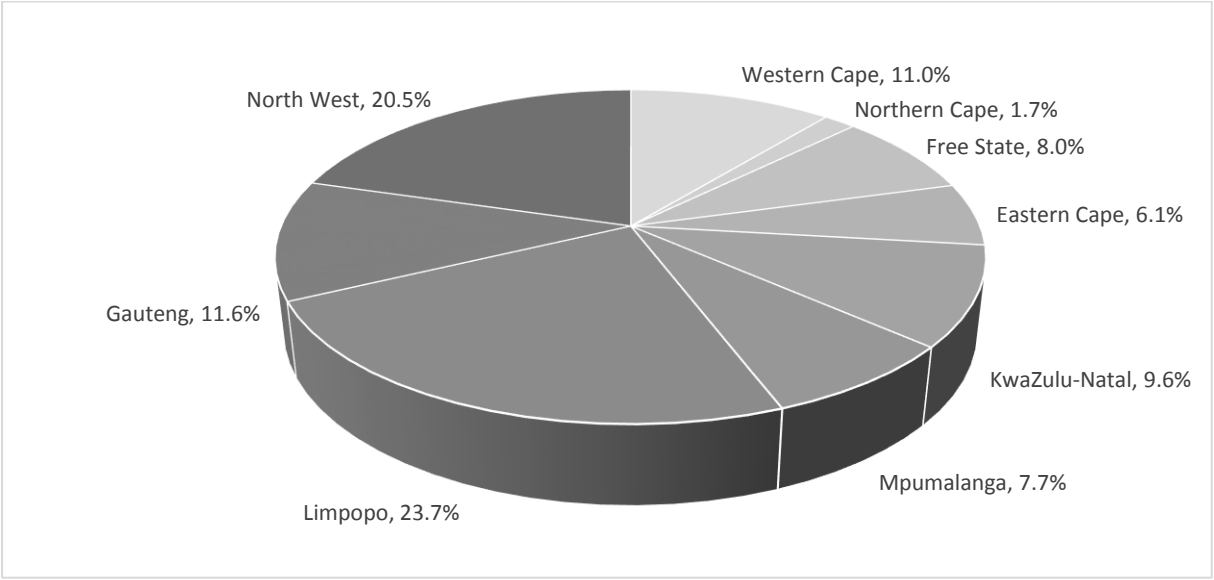


Source: Red Meat Levy Admin (2015)

- Pigs

The provinces with the largest pig populations are Limpopo (23.7%), North West (20.5%), Gauteng (11.6%) and Western Cape (11.0%) provinces. There are approximately 400 commercial pork producers and 19 stud breeders in South Africa, spread across the country, but predominantly located in the Limpopo, North West, Gauteng and Western Cape provinces. It is estimated that pig numbers have decreased by 1.0%, to 1.56 million in August 2014, as of the same period the previous year. The complete provincial breakdown can be seen in Figure 8.5.

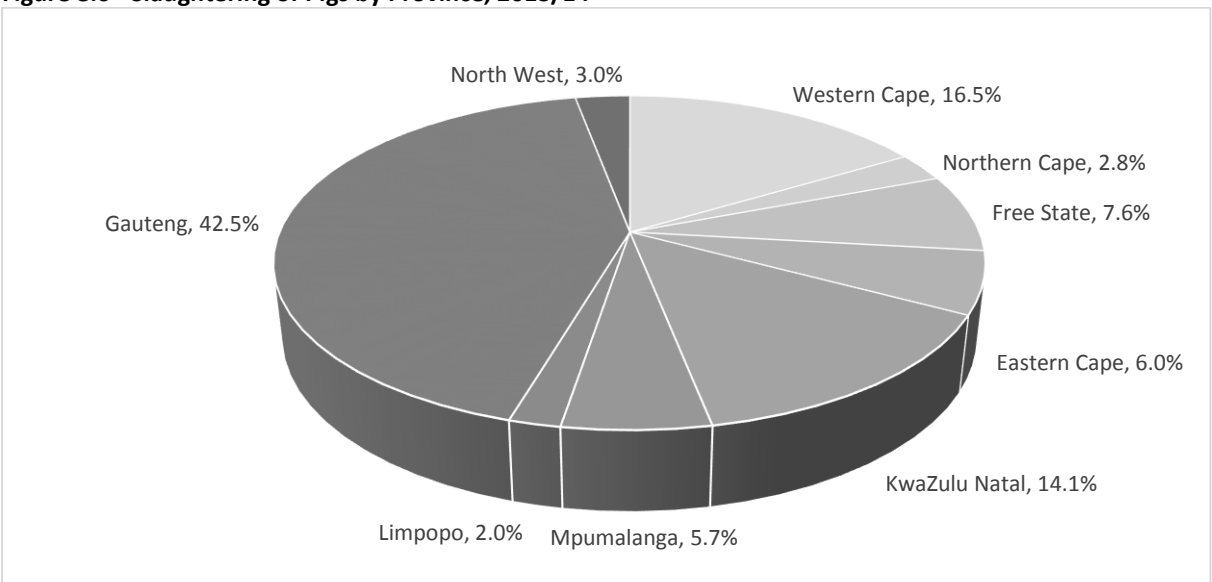
Figure 8.5 - Distribution of Pigs by Province, 2014



Source: DAFF (2015C)

In terms of production, 2.724 million pigs were slaughtered over in 2014, with 1.157 million or 42.5% of the total slaughtered in Gauteng. The provinces which followed in terms of volume of pigs slaughtered was the Western Cape and KwaZulu-Natal. The provincial breakdown can be seen in Figure 8.6.

Figure 8.6 - Slaughtering of Pigs by Province, 2013/14

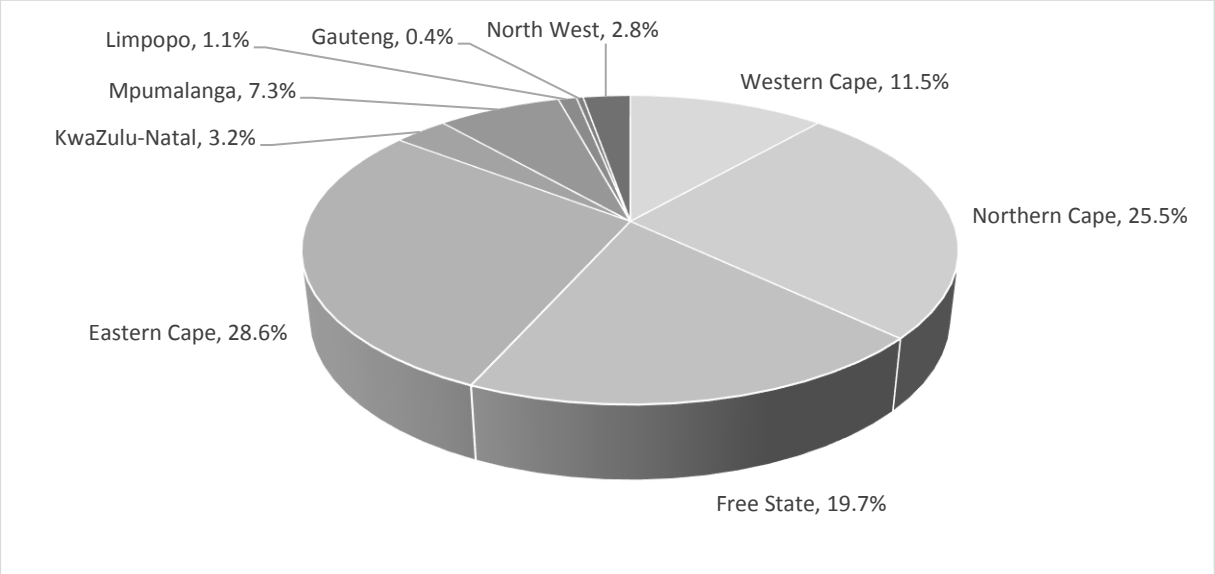


Source: Red Meat Levy Admin (2015)

- Sheep

Sheep farms are found in all provinces, however, the majority are concentrated in the more arid regions of the country. The total number of sheep in South Africa at the end of August 2014 was estimated at 24.38 million, 0.6% lower than the previous year. The provinces with the largest sheep populations are the Eastern Cape (28.6%), Northern Cape (25.5%), Free State (19.7%) and the Western Cape (11.5%). The complete provincial distribution can be seen in Figure 8.7.

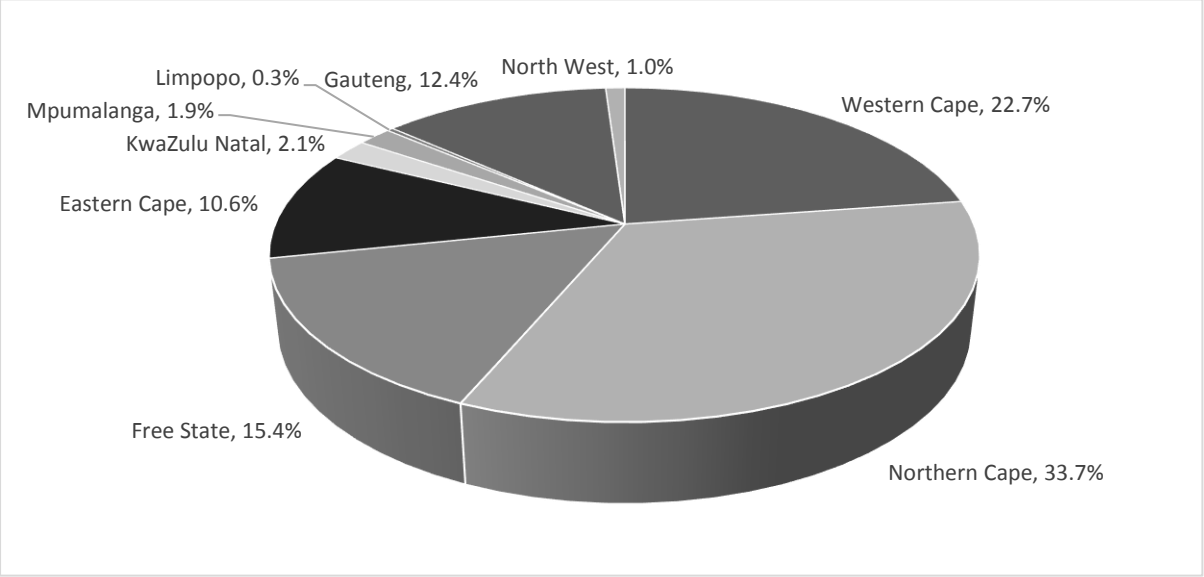
Figure 8.7 - Distribution of Sheep by Province, 2014



Source: DAFF (2015C)

In terms of production, 5.492 million sheep were slaughtered in 2014, with main provinces in which this was undertaken the Northern Cape, the Western Cape and the Free State. The provincial breakdown can be seen in Figure 8.8.

Figure 8.8 - Slaughtering of Sheep by Province, 2013/14



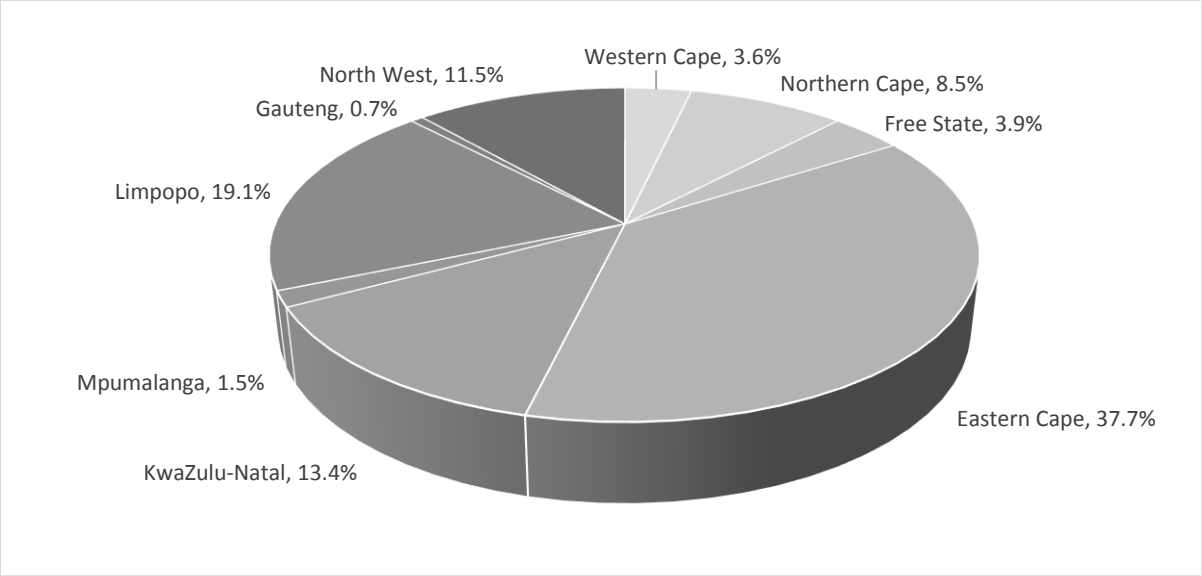
Source: Red Meat Levy Admin (2015)

Flock sizes vary between less than 50 and 1 800 animals, with the larger herds found in the Eastern, Western and Northern Cape provinces.

- Goats

Goat populations are found mainly in the Eastern Cape (37.7%) followed by Limpopo (19.1%), KwaZulu-Natal (13.4%) and North West (11.5%) provinces. Estimates indicate that there was a decrease of 0.9% in the number of goats between August 2013 and August 2014, to 5.976 million in August 2014. The provincial distribution of goats can be seen in Figure 8.9.

Figure 8.9 - Distribution of Goats by Province, 2014.



Source: DAFF (2015C)

8.4.2 Local Consumption

The industry is experiencing pressure from various sources, most notably increased competition from overseas producers and changes in consumer preferences towards poultry and other substitute goods. This has resulted in red meat consumed per capita remaining relatively stagnant over the last few years, fluctuating between 24kg and 26kg per capita. This can be linked to the declining per capita disposable income, which encourages the substitution of red meat for other products, such as poultry.

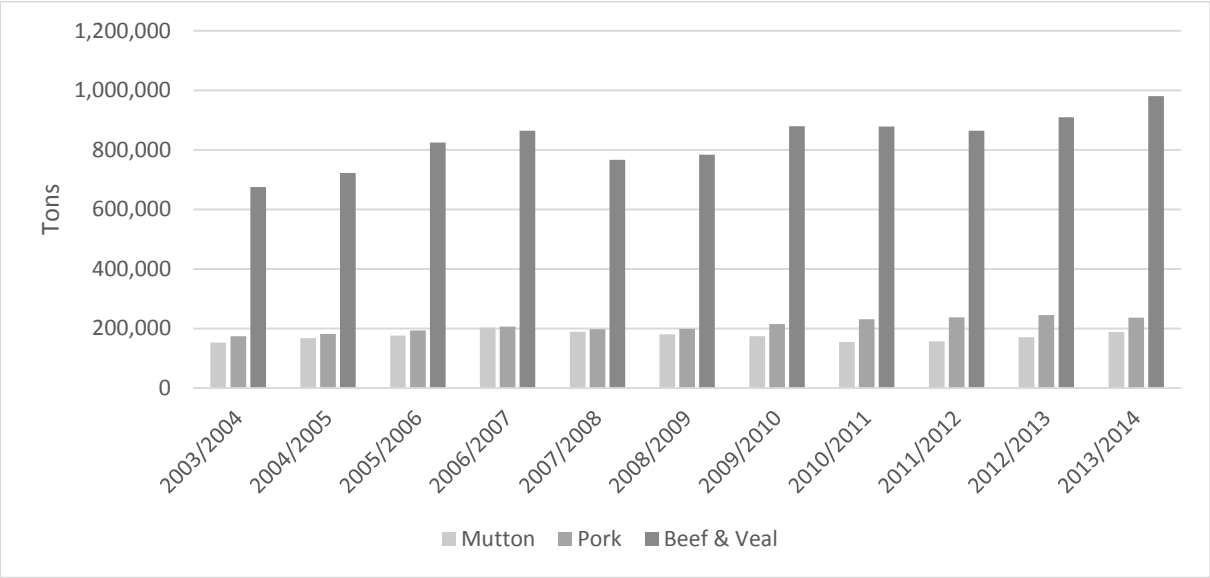
Although per capita consumption is stagnant, total consumption in tons has increased over the 2003/04-2013/14 period. In 2014 national consumption of red meat totalled 1 405 000 tons, including 188 000 tons of mutton, 236 000 tons of pork and 981 000 tons of beef & veal. The consumption of white meat is 45% higher than that of red meat, with 2 040 000 tons consumed in South Africa in 2014.

Figure 8.10 provides red meat consumption over a ten year period. Mutton consumption was higher than production by some 32 700 tons in 2003/04, with consumption increasing to 188 000 tons in 2013/14, with a deficit of only 4 600 tons. Mutton consumption grew 9.9% between 2012/13 and 2013/14, whilst production increased by 11.6% in the same period.

Pork production increased by 5.4% over the 2012/13 to 2013/14 period, whilst consumption decreased by 3.7%. Beef & veal production increased by 8.6% whilst consumption grew 7.6% in the same period. Since 2003/04

consumption has grown on all products with mutton, pork, beef & veal growing by 22.9%, 35.6% and 45.3% respectively.

Figure 8.10 - South African Red Meat Consumption, 2003/04 – 2013/14



Source: DAFF (2015A)

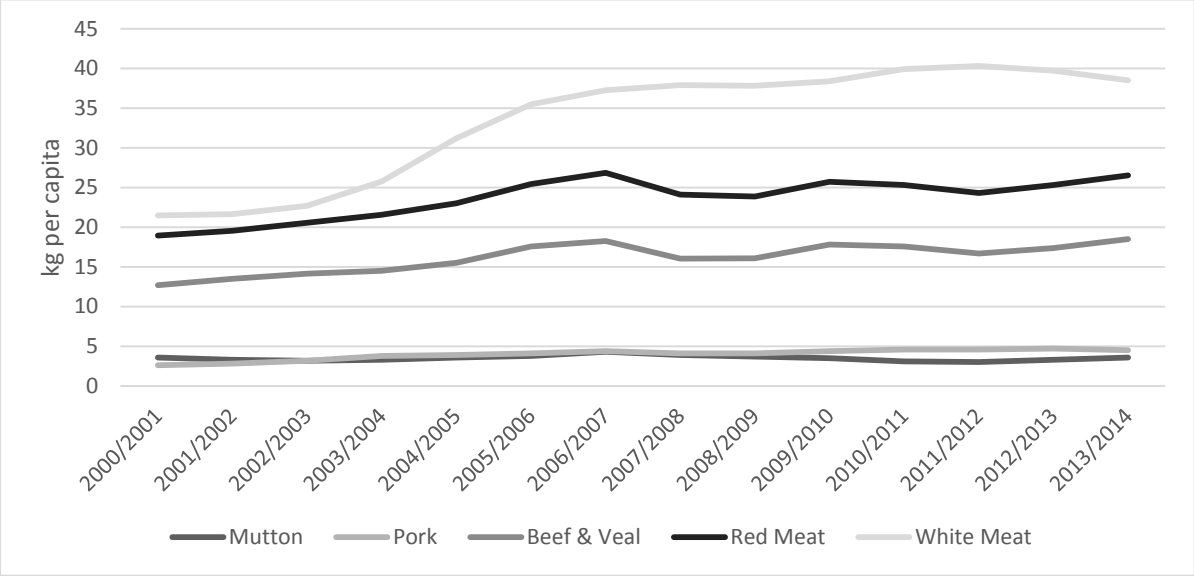
South African per capita consumption of meat products shows consumption relative to the population size, as indicated in Figure 8.11. The changes in the red meat per capita consumption were largely attributed to changes in consumption of beef & veal, which increased by 45.9% since 2000. In comparison white meat consumption per capita increased by 79.2% over the same period. Red meat consumption per capita can be seen to mirror the beef graph line very closely, also increasing by 39.9% over the 2000/01 – 2013/14 period. Red meat consumption per capita peaked at 26.87kg per capita in 2006/2007, higher than the current consumption per capita in 2014 at 26.53kg per capita.

Mutton consumption per capita has remained fairly stable, with 3.6kg per capita consumed in both 2000/2001 and 2013/2014, a zero percentage change. Pork consumption per capita increased by 73.1%, from 2.6kg to 4.5kg over the 2000/01 – 2013/14 period.

In 2014 consumption per capita grew for that year by 6.4% for beef & veal, 9.1% for mutton and -4.3% for pork. Red meat consumption per capita in total grew by 4.7% in 2014, in contrast to white meat, which dropped by 3.0%.

White meat consumption per capita has increased sharply since 2004/05 as can be seen when compared to the earlier years. Per capita consumption of white meat started to deviate significantly from the red meat consumption trends during that year and this trend has continued since that point. Indicating the increased competition Red Meat has received from substitute products.

Figure 8.11 - South African Meat Consumption per Capita 2000/01 – 2013/14



Source: DAFF (2015A)

8.4.3 Local Market Developments

The most significant development in the red meat industry has been vertical integration, occurring through feedlots entering the red meat market; the marketing regime; and the major expansion of the abattoir industry.

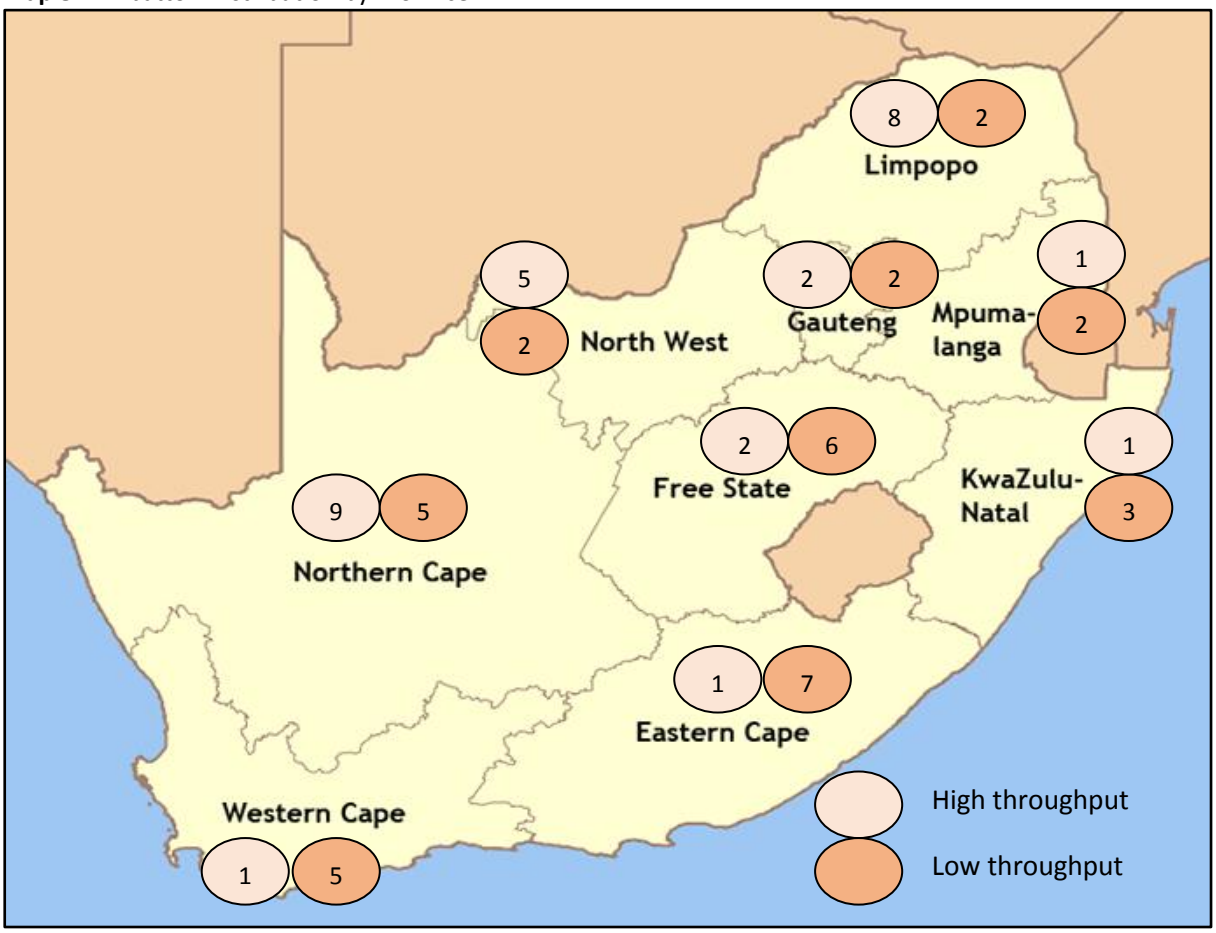
Vertical integration has characterised the industry over recent years, mainly through larger feedlots establishing their own abattoirs. Furthermore, some feedlots have included further integration down the value chain and sell directly to the customer through their own retail outlets, for example Eskort.

The previous market regime only allowed meat wholesalers to purchase carcasses on a wholesale system. Now, wholesalers can source live animals (excluding weaners) directly from farmers and feedlots on a willing buyer/ willing seller basis. This allows the wholesaler to take ownership of the animal prior to slaughtering. The animals are then distributed to an abattoir of the wholesalers' choice from which point the carcasses are distributed to various retailers.

The deregulation of the red meat industry in the early 1990s has seen a significant expansion in the number and capacity of abattoirs. The industry can be further divided into those abattoirs linked to feedlots, the wholesale sector, or municipal owned, and those that are owned by farmers and small, medium and micro-sized enterprises (SMME's).

Approximately 449 red meat abattoirs currently operate in South Africa. According to the Department of Agriculture, Forestry and Fisheries (DAFF) approximately 60% of all slaughtering is carried out by abattoirs that are highly regulated with a high throughput capacity. Other large-scale abattoirs, known as low throughput abattoirs also operate within the province, with approximately 34 spread throughout the country. Many of these abattoirs have linkages with feedlots. Approximately 60% of the 80% of livestock that go through feedlots are slaughtered by abattoirs that are vertically integrated. The remaining abattoirs are considerably smaller, servicing small livestock producers and localised population centres, most commonly known as butchers and rural throughput abattoirs.

Map 8.1 - Abattoir Distribution by Province

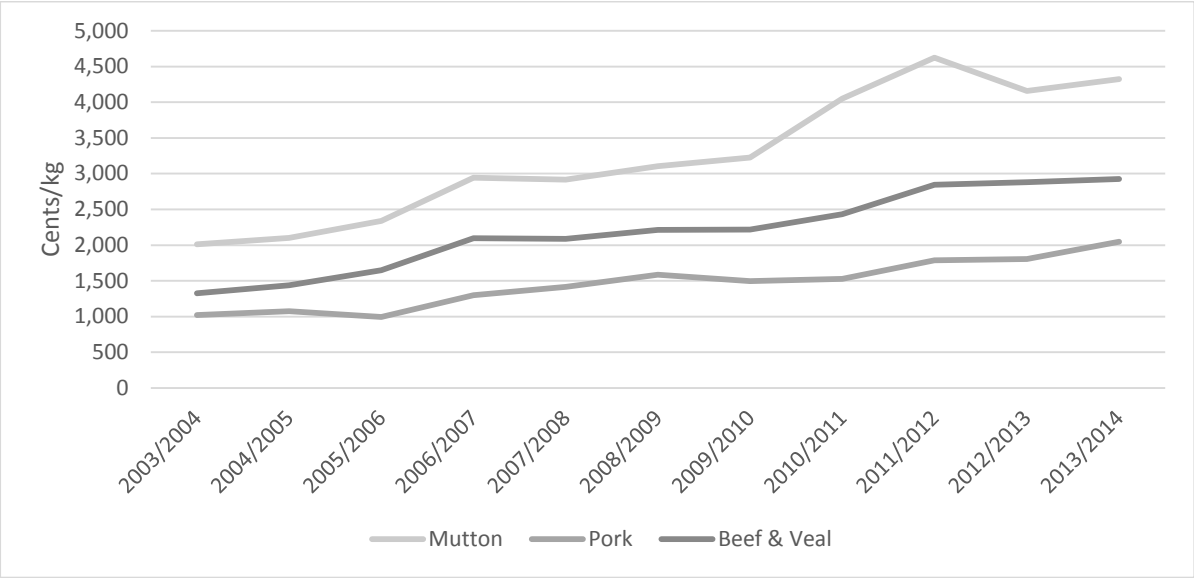


Source: DAFF (2013)

8.4.4 Price

South African market price is measured through the price per kilogram of the chilled carcass post slaughter. As can be seen within Figure 8.12, all three commodities have seen an increase in their price over the 2003/04 to 2013/14 period. Prices increased for all products in 2006/07 and 2011/12. Mutton prices have been the most vulnerable to these price increases. Pork prices are the most stable of the three, with beef and veal prices performing between the two. In terms of total growth, cattle carcasses experienced the greatest increase in value between 2003/04 and 2013/14, increasing by 120.9%. Sheep carcasses increased by 114.8%, while pig carcasses increased by only 100.5% over the same period. In the most recent period, of 2012/13 – 2013/14, the inverse is true, with pork prices increasing by 13.2%, mutton by 4.0%, and beef & veal by only 1.6%.

Figure 8.12 South African Price per Chilled Carcass, 2003/04 – 2013/14



Source: DAFF (2015A)

Abattoirs generally purchase livestock from producers or feedlots at a price that is based on the cold carcass weight of the animal. The price paid for the carcass further depends on the age and type of slaughtered animal, as well as fat content. The carcass is first classified according to a classification system, and a price is then determined.

The classification system is derived from two characteristics, namely age and carcass fat content. Animal carcasses are classified into four different groups according to age which is determined by the number of permanent incisors. The carcasses are then further classified according to subcutaneous fat content on a scale of 0 to 6 (i.e. 0 = no fat, 6 = high fat content).

Table 8.5 summarises the South African carcass classification described above. Animal suppliers are penalised with lower prices for older aged animals with high fat contents.

Table 8.5 - South African Carcass Classification System

Trait	Beef/Sheep/Mutton						
Age	A		AB		B		C
# Permanent Incisors	0		1-2		3-6		>6
Roller Mark	AAA		ABAB		BBB		CCC
Colour	Purple		Green		Brown		Red
Tenderness	Most Tender		Tender		Less Tender		Least Tender
Fat Grade	0	1	2	3	4	5	6
Beef (Fat thickness mm)	0	<1	>1<3	>3<5	>5<7	>7<10	>10
Sheep (Fat thickness mm)	0	<1	>1<4	>4<7	>7<9	>9<11	>11

Source: Olivier (2004)

Abattoirs and meat processors sell products that are priced according to meat cut and quality. Typically, A-grade meat products fetch a higher price than C-grade products do. Lower grade products, however, can go through a

value adding process in order to increase margins. For example, lower grade meats marinated, spiced, pre-cooked, or minced to produce burger patties and meat balls.

Hides are also produced from the abattoir, predominantly cattle hides, although a few sheep, goat and pig skins will also be produced. The prices for the hides are determined by hide quality and weight. Cattle hides currently trade at between R14.00 and R15.00 per kilogram, while sheep pelts trade for between R70.00 and R120.00.

8.4.5 Industry Associations

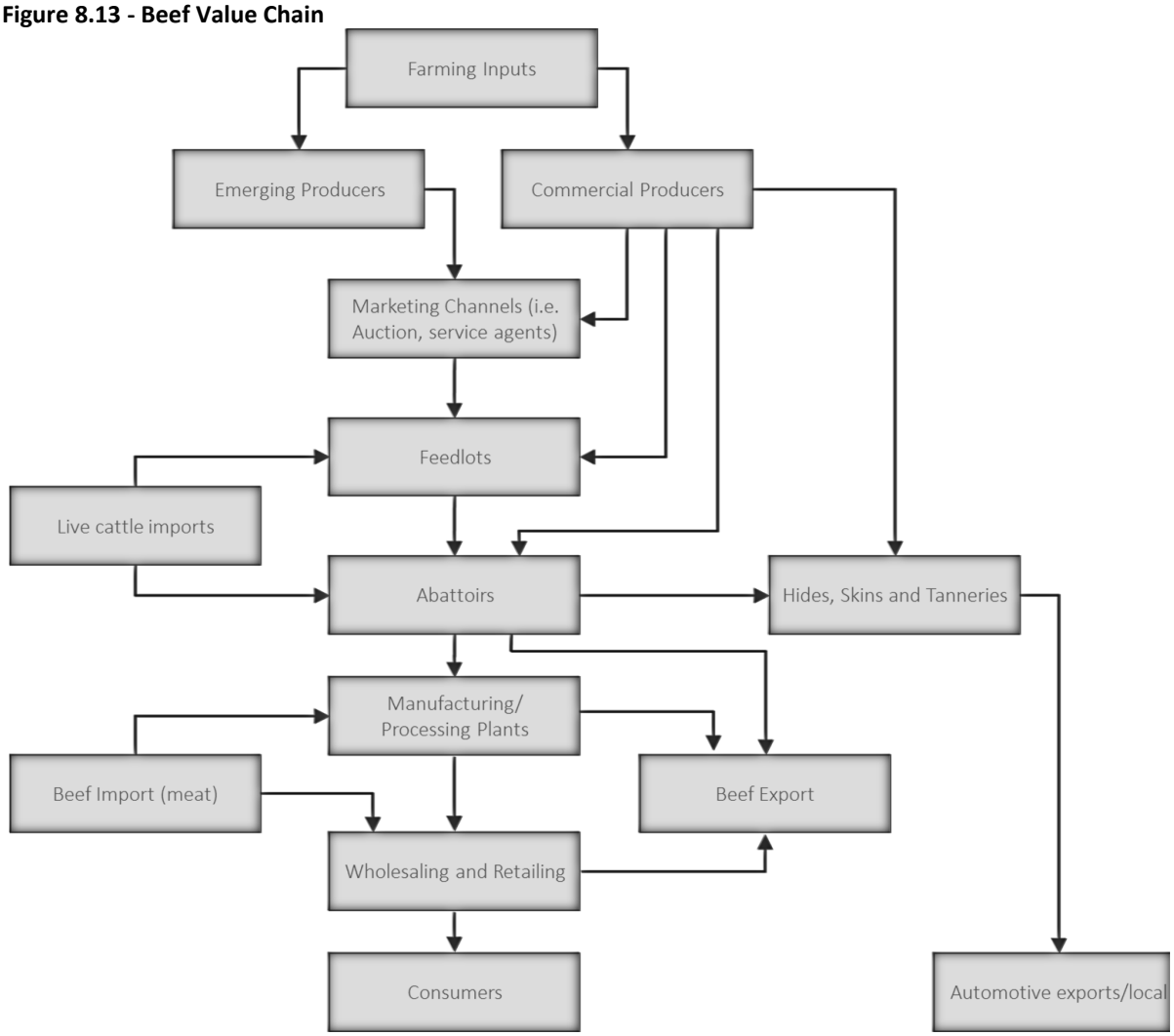
The Red Meat Producers' Organisation (RPO) and the National Emergent Red Meat Producers' Organisation (Nerpo) represent producers in the commercial and emerging agricultural sectors respectively for the red meat production market. The Red Meat Abattoir Association (RMAA) also serves as a serves as a centralised point organising training sessions, to ensure hygiene and legislation adherence, as well as an information source for established and emerging abattoirs within the country.

The South African Pork Producers' Organisation (SAPPO) is the official association of pork producers in South Africa. The organisation is primarily concerned with administration, liaison with government, the promotion of pork and pork products and matters of national interest such as health and research.

Sheep producers are represented by organisations that govern and assist the mutton and the wool industry. The sheep industry also has various breeders' associations, with the Dorper Sheep Breeders' Society of South Africa and Merino SA being the most prominent. Cape Wools SA and the National Wool Growers Association serve to protect and promote farmer's interests and protect the wool industry and legislative environment. Cape Mohair and Wool serves as a wool market.

8.5 Beef Value Chain Analysis

Figure 8.13 - Beef Value Chain



Source: Urban-Econ (2015)

8.5.1 Upstream activities

As cattle production is classified as primary production the upstream activities relevant to the value chain are primary the input supplies used in the production system. The major inputs for livestock production include animal genetic resources, feeds and forages, veterinary drugs, vaccines, machinery equipment as well as knowledge. Most of these inputs are supplied by Agricultural Co-operatives in the respective areas. The Eastern Cape Province has three major Agricultural Co-operatives namely:

- OVK – TRADE
- Humansdorp Ko-op
- East Cape Agri – Co-op Ltd / BKB LTD

8.5.2 Primary production activities

Beef is produced throughout South Africa. The amount of beef produced depends on the infrastructure such as feedlots and abattoirs, not necessarily by the number of cattle available in those areas. South Africa has highly developed transport infrastructure that allows movement of cattle and calves from one area to another, even from other countries such as Namibia. For these reasons, Mpumalanga commands the greatest share of beef production in South Africa accounting for 23% of the beef produced in 2009 followed by Free State and Gauteng taking up 20% and 13% respectively.

8.5.3 Downstream activities

The red meat industry evolved from a highly regulated environment to one that is totally deregulated today. Various policies, such as the distinction between controlled and uncontrolled areas, compulsory levies payable by producers, restrictions on the establishment of abattoirs, the compulsory auctioning of carcasses according to grade and mass in controlled areas, the supply control via permits and quotas, the setting of floor prices, removal scheme, etc., characterised the red meat industry before deregulation commenced in the early 1990s. Since the deregulation of the agricultural marketing dispensation in 1997, the prices in the red meat industry are determined by demand and supply forces. Prices of beef increased significantly from 1999/00 to 2008/09 mainly due to increased consumption caused by rising living standards of larger number of consumers and low domestic production. There was an increase of R13.77/Kg in 2008/09 compared to 1999/00.

The market players in the beef industry are vertically integrated. They have their own feedlots, abattoirs, processors and distributors. It is estimated that there are approximately 50 000 farmers currently farming with livestock. This includes producers that keep livestock as their main enterprise and those that keep livestock as a secondary enterprise. They own around 8.2 million cattle. There are 240 000 small-scale farmers and 3 million subsistence farmers that own around 5.69 million cattle.

The beef supply chain has become increasingly vertically integrated. This integration is mainly fuelled by the feedlot industry where most of the large feedlots own their own abattoirs, or at least have some business interest in certain abattoirs. In addition, some feedlots have integrated further down the value chain and sell directly to consumers through their own retail outlets. Some abattoirs have also started to integrate vertically towards the wholesale level. Under the previous marketing regime, wholesalers mostly bought carcasses through the auction system. Currently, many wholesalers source live slaughter animals (not weaners) directly from farmers or feedlots on a bid and offer basis, i.e. they take ownership of the animal before the animal is slaughtered. The animal is then slaughtered at an abattoir of the wholesaler's choice, where after the carcass is distributed to retailers. In some instances, the public can also buy carcasses directly from wholesalers. The abattoir industry has expanded tremendously in number and in capacity.

The beef industry produces around 808 800 tons of meat and imports around 7 059 tons while exporting 3 537 tons. Per capita consumption is around 20.87 kg and number of consumers is around 48.6 million. A list of abattoirs that process red meat is contained within Table 8.6.

- Major Beef feedlots active in the Eastern Cape Buying Markets
    - Austin Evans Feedlot – Somerset East
    - ADAM AGRI – Colesburg
    - BEEFCOR – Bronkhorstspruit
    - Beefmaster – Christiana
    - Chalmar Beef – Wingate Park
    - DC Louw Feedlot – Adelaide

- KARAN BEEF – HEIDELBERG
- SPARTA BEEF – MARQUAD

Table 8.6 - Major Abattoirs in the Eastern Cape

Abattoir Name	Species	TP	Owner/Contact	Postal address
Adelaide Abattoir	B/O/S	L	Messrs K T Schreiber & K Morgan	Adelaide
Umzimvubu Goat Abattoir	Sheep only	L	Alfred Nzo District Municipality	Mountt Ayliff
Aliwal Abattoir	B/O/S	L	J H Geldenhuys	Aliwal North
Barkly East Abattoir	B/O/S	L	P F Boshoff	Barkly East
Umzikantu Abattoir	B/O/S	H	Ntinga O.R. Tambo Development Agency	Umtata
Blaauwkrantz Slagtery Abattoir	B/O/S	R	A N Smuts	Queenstown
Winterberg Landbouskool Abattoir	B/O/S	R	The Principal Management Comm.	Fort Beaufort
B&B Stormberg Ab	No Pigs	L	B Marx	Burgersdorp
Witelsbos Abattoir	No Pigs	R	P S Ferreira	Witelsbos
Cathcart Abattoir	B/O/S	L	K C Wearing	Cathcart
Cradock Abattoir	Not active	L	Cradock Abattoir	
Sandfontein Abattoir	No Pigs	R	J M Gerber	Lamotte
J.B. Abattoir		L	A J du Plessis	
Fort Beaufort Municipal Abattoir		L	Nkonkobe Municipality	
Grahamstown Ostrich Abattoir	Ostrich/B/O/S	H	Grahamstown Ostrich Export Co Ltd	
Du Preez Boerdery	Cattle U/Const	R	Marius du Preez	
Humansdorp Abattoir	B/O/S	H	Spitzbak Estate (Pty) Ltd	
Deepdrift	Sheep	R	T H Ward	
Dieprivier Abattoir	Sheep	R	Clive Bramwell	
Karnoor Abattoir	B/O/S	L	Kings Beach Investments	
Grootfontein ADI	No Pigs B/O	L	Department of Agr Grootfontein ADI	
Skoonfontein	Sheep	R	H J Labuschagne	
Lady Grey Abattoir		R	PS 2053 Investment	
Aandrus Abattoir	Pigs	R	C R Myburgh	
Grandview Abattoir	B/O/S	R	Ms Elana Olivier	
Karoo Natal Abattoir	No Pigs B/O	L	M Lessing	
Stormberg Abattoir	B/O/S	L	T van Straaten	
Fort Cox Agric College Abattoir	B/O/S	R	Fort Cox Agric College	
Wancor Abattoir	B/O/S	L	H J M Gerber Wancor	
East London Abattoir	B/O/S	H	East London Abattoir (Pty) Ltd	
Red Line Abattoir	Sheep	L	C L du Plessis Kleinplaas	
Elandsfontein Abattoir	B/O	R	J H van Wyk	
Bacon & Beef Abattoir	B/O	L	Daan Landman	
Eastern Province Livestock	Ostrich Game B/O/S	H	G W & J N Moorcroft	
Hanover Cold Storage Abattoir	B/O	L	O E Bahlman Hanover	
Riefontein Abattoir	B/O/S	L	F P G Dorfling Rietfontein	
Meat Traders Abattoir	B/O/S	H	Queenstown Abattoir (Pty) Ltd – S R Miles	
Austin Evans	B/O	H	Austin Evans Enterprises CC	

Abattoir Name	Species	TP	Owner/Contact	Postal address
Sterkstroom Abattoir	B/O/S	R	L A Haggard	
Steynsburg Abattoir	B/O/S	L	Kaltenbraum Slaghuis C F Marais	
Graaff Reinet Meat Processing Abattoir	B/O/S	L	W F Gouws	
Amatola Abattoir	B/O/S	L	M D Römer J W Wattrus (Manager)	
Tarka Abattoir	B/O/S	L	E C Barnard	Tarkastad
Xalanga Abattoir	B/O/S	L	N J van Niekerk	Indwe
Venterstad Abattoir	B/O/S		N V R Ferreira	Vensterstad
Hillmoor Abattoir	Sheep	L	I E Dell	Steynsburg
Hillcrest Abattoir	Pigs sheep	L	K R & S Miller	Uitenhage
Conway Abattoir	B/O game	R	A P Marais	Fish River
Antons Abattoir	Sheep	R	A Greeff Mountain View	Despatch
Aalwynshoek Abattoir	B/O/S	H	H Stumke Aalwynhoek	Uitenhage
Holme Park Abattoir	Pigs	L	K B Day & Sons	Komgha
Kareedouw Abattoir		L	M A Strydom	Kareedouw
Karoo Wild Game Abattoir	Game	L	Me S Kleinhans	Jansenville
Game Zone Game Abattoir	Game	H	Dillon Lindhorst	Adelaide
P&D Farming Abattoir	B/O/S	H	P&D Farming CC Glen Victor	Komga
De Wilge	B/O/S	R	Pieter J Celliers	Cradock
Andrews Abattoir	B/O/S	L	Brostwo CC Ecowa	Elliot
Hauman Boerdery	Sheep	R	DFT Hauman	Steynsburg
Rosedale Abattoir	Bovine	R	A le Roux	Grahamstown
Kleinbegin Abattoir	Pigs	L	Me E Stander	Linton Grange
Kei Livestock Abattoir	B/O	H	C E Connellan & C G Sheard	Homeleigh
Post Chalmers Abattoir	B/O/S	L	AT van Heerden Denmark	Cradock
Karoo Ochse Abattoir	B/O	H	Frans Ferreira (Edms) Trust	Port Elizabeth
Twee Riviere Abattoir	B/O/S	L	G Fourie	Joubertina
Transkei Meat & Livestock Abattoir	B/O/S	L	Impact Plus Trading 551 CC	Mthatha
J C Steyn Correctional Services Abattoir			Dept of Correctional Services	Kirkwood
Fonte Abattoir	B/O/S	R	J du Plessis Family Trust	Humansdorp
Bosbok Abattoir	Sheep	R	J Strydom Hartebeesfontein	Humansdorp
Rosmead Abattoir	B/O/S	L	Messrs J C & J R Louw	Middelburg
Tayside Abattoir	B/O/S	L	J W B Shaw	Kidds Beach
Fish River Abattoir	Game	L	John Coetzee	Grahamstown
Olyvenfontein Abattoir	U/con		Deon Taljaard	Jansenville
Lofdal Slagtery Abattoir	Sheep	L	Me Amour Strydom	Aberdeen
Walplaas Abattoir	Sheep	L	W R Pienaar	Graaff Reinet
Rosedale Abattoir	Sheep	L	J P Zietsman	Humansdorp
Dowefontein Abattoir	Sheep	L	H T Marx	Aberdeen
Kleinvlei Abattoir	Sheep	L	J C Oosthuizen	Venterstad
Cornish Abattoir	B/O	L	Willem Stapelberg	Indwe

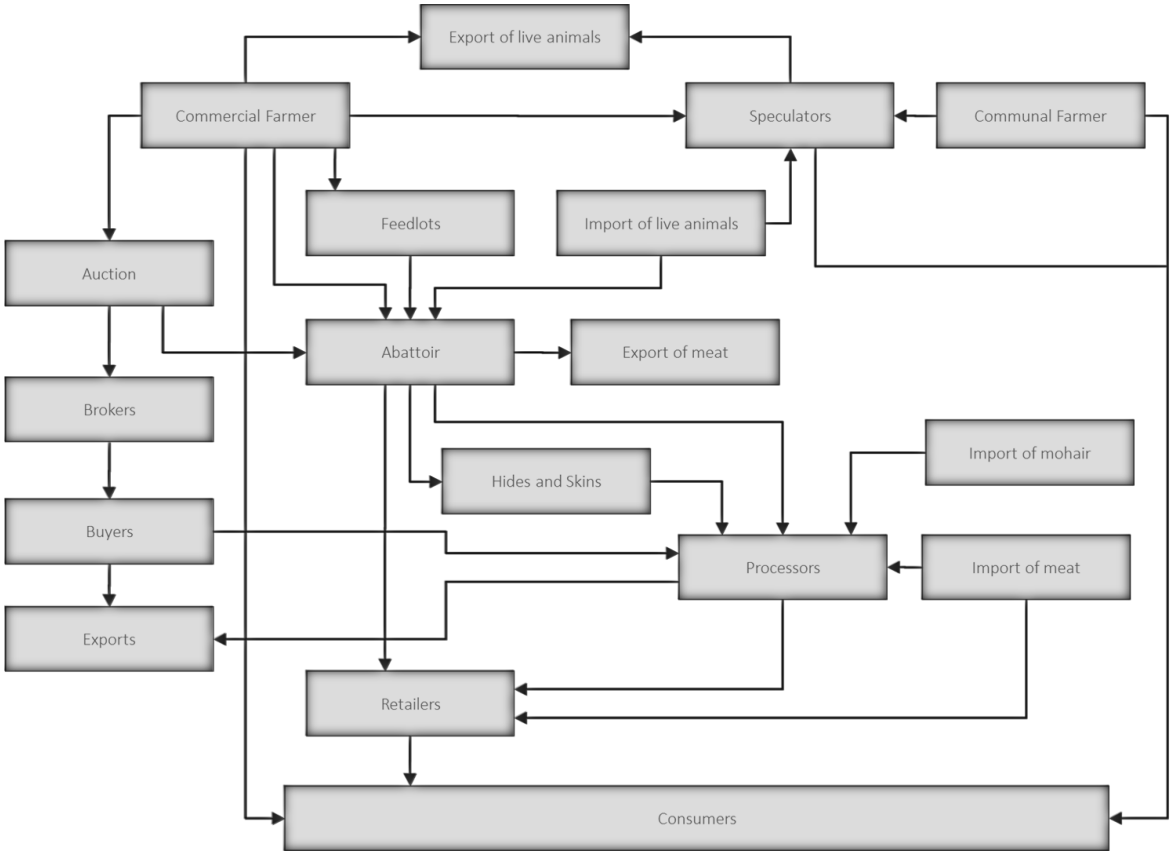
8.5.4 Agro-processing opportunities

Abattoirs to be utilised with sufficient throughput. Distance from market is important. Capacity to management abattoirs. Consider processing of lower grade beef.

It should be noted that there is an existing abattoir in Mthatha.

8.6 Sheep and Goat Value Chain Analysis

Figure 8.14 - Sheep and Goat Value Chain



Source: Urban-Econ (2015)

The Eastern Cape is regarded as South Africa's livestock province with significant numbers of cattle, sheep and goats. Domestic and foreign markets are available in terms of organic livestock production, product beneficiation and livestock bi-products (leather). The agricultural opportunities in the province for livestock, if harnessed, could yield significant returns in terms of the following:

- **Organic meat production:**
  - Organic meat supply is becoming a global trend. The Eastern Cape provides opportunities for investment in primary and secondary organic meat farming for both the domestic and international market.
- **Livestock farmers:**

- The province is looking to establish new commercial livestock enterprises. Interested investors can partner with community-based organisations and agricultural co-operatives to utilise local skill and knowledge around livestock farming in the Eastern Cape.

- **Sheep and goat breeding:**
  - Sheep and goat breeding, as part of community agricultural development, has significant opportunities in the rural areas. Opportunities exist in supply of young sheep and goats to rural farmers, meat production, hide beneficiation and the provision of alternative breeding stock.

8.6.1 Upstream activities

As sheep production is classified as primary production the upstream activities relevant to the value chain are primary the input supplies used in the production system. The major inputs for livestock production include animal genetic resources, feeds and forages, veterinary drugs, vaccines, machinery equipment as well as knowledge. Most of these inputs are supplied by Agricultural Co-operatives in the respective areas. The Eastern Cape Province has three major Agricultural Co-operatives namely:

- OVK – TRADE
- Humansdorp Ko-op
- East Cape Agri – Co-op Ltd / BKB LTD

8.6.2 Primary production activities

Goats are farmed throughout South Africa. In regions where bush encroachment is rife goats are farmed together with cattle. The robust Boer goats and hardy African goats fare well in these combined production systems. In the dry North West region, extensive ranching of goats is done together with Karakul, Persian and Dorper sheep. Angora goats are an important industry in the Eastern Karoo. Farming with Angoras extends into the temperate regions and to the Lesotho highlands. Milk goat farming is not a major industry. However, given the high occurrence of cow milk allergy, there are considerable opportunities for this industry to expand.
Goats make a valuable contribution to the livestock industry in southern Africa. In the rural, economically deprived regions goats are a ready source of cash-income and food and social security. The greatest need for research into the constraints in livestock production lies in these regions. Agriculture can no longer afford inefficiency in any form. Whilst traditional livestock production is a part of cultural life, inefficiency can no longer be part of it and cannot be afforded.

Sheep are also farmed throughout South Africa and are largely farmed in semi-arid to grassland areas. Wool is produced throughout South Africa, but the main production areas are situated in the drier regions of the country. On a provincial basis, the Eastern Cape is the largest wool-producing region, having produced 27% of the national clip, followed by the Free State, Western Cape, Northern Cape and Mpumalanga. Wool price increases have been unprecedented and are mainly driven by the increasing shortage of Merino wool for apparel and resulted in strong competition on primary processing level for wool to keep mills running. Although supply concerns were the main driving force behind the price increases, exchange rates also played a significant role. The currencies of most of the major wool-exporting countries, but particularly that of South Africa and Australia, fell to their lowest levels ever against the US dollar, which helped to boost prices South Africa is mainly producing a Merino clip, which comprises over 80% of all lots offered for sale. Mean fibre diameter is the major price determinant for Merino wool, with finer micron categories normally commanding a premium over medium and strong wool.

There are various marketing channels

- Auctions
- Production sales

- Contract Selling
- Direct Sales

Lambs are marketed at between six months and two years in order to obtain the best prices for quality animals. The slaughter market generally requires an animal weighing between 30kg and 45kg on the hoof.

8.6.3 Downstream activities

- **Products**

The main products from goats are meat, milk, hides and fibres. The main products from sheep include meat and fibre

- **Meat products**

The Boer goat is regarded as the only breed of goat on earth that is bred exclusively for meat. Slaughter-masses vary from 35 to 40 kg for rams, and from 30 to 35 kg for ewes and adult animals.

Mutton is obtained from more matured sheep awhile lamb is obtained from younger lambs.

- **Milk production:**

It is claimed that goat's milk is better than cow's milk for human consumption. A comparison of goat's milk and human breast milk has shown that the protein content of goat's milk is higher than that of breast milk, 25% protein in the case of goat's milk, against 7% for humans. The total fat content in both cases is virtually identical, however goat's milk also contains more calcium and phosphates than human milk, with respect to the required amounts for babies, without any detrimental effects on the child.

As in the case of cow's milk, untreated goat's milk can also transmit diseases such as brucellosis, but not tuberculosis, since goats do not readily succumb to tuberculosis. Goat's milk tends to be more suitable for the treatment of stomach ulcers. In poor countries where the consumption of meat is low, goat's milk provides for an important daily intake of protein, phosphorus and calcium which would not otherwise have been available due to the severe shortage of cow's milk.

- **Agro-processing opportunities**

Abattoirs to be utilised with sufficient throughput. Distance from market important. Capacity to management abattoirs. Consider processing of lower grade beef. It should be noted that there is an existing abattoir in Mthatha.

Wool washing plant could be considered, but it should be noted that most of South African raw wool is exported and there is limited scope for this activity. The main market where wool is sold is in Port Elizabeth. Most of the international buyers buy from this platform. With regards to wool processing; South Africa is currently not internationally competitive (high processing cost). Weaving on a small scale may however be a processing opportunity.

8.7 Competitors

While there are numerous established commercial farmers in the District competition is seen as an advantage rather than a disadvantage in this situation. Commercial farmers have established contacts and networks that they can take advantage of. This information can be accessed through various government programmes which encourage mentorship of farmers. The benefits of farming in areas that already have a strong presence of farmers is possibly more of a benefit than a disadvantage. The largest form of competition will come in the form of cheaper imports of poultry from the USA as part of the AGOA act that was recently amended.

8.8 Stakeholders

There are a number of organisations involved in the red meat value chain in South Africa. One of the key organisations is Red Meat Producers Organisation (RPO). RPO is service organisation that acts as mouthpiece for South African commercial red meat producers. It is an independent producer's organisation that strives to dynamically promote the sustainability and the profitability of the red meat industry in South Africa. Table 8.7 shows other key stakeholders in the red meat sector in South Africa.

Table 8.7 – Red Meat Stakeholders

Stakeholder	Description
Red Meat Abattoir Association (RMAA)	The RMAA is an independent membership-based organisation. Its primary aim being training at all abattoirs in South Africa. The Association is a representative forum for red meat abattoir owners in South Africa and aims to establish communication and co-operation between the members of the Association.
Livestock registering federation	The principal business and purpose of the Livestock Registering Federation shall be to unite, promote and protect its members acting as Independent Registering Authorities (animal Improvement Act 62 of 1998), into an affiliated federation.
South African Meat Industry Company (SAMIC)	SAMIC is a quality assurance company which was created by the Red Meat Industry of South Africa to ensure the quality and safety of meat in South Africa.
National Emergent Red Meat Producers' Organisation (NERPO)	The primary aim of NERPO is to commercialise the developing agricultural sector and ensure meaningful participation of black individuals within the mainstream commercial agribusiness sector, hence ensuring the long term sustainability of the agricultural sector in South Africa.
Red Meat Industry Forum	The Red Meat Industry Forum of South Africa represents all the most nationally representative sector specific role player organisations within the red meat value chain.
South African Feedlot Association (SAFA)	The SA feedlot industry was started during the 1960s by a few entrepreneurial cattle farmers in the grain producing areas who were forced, due to a lack of grazing, to "over-winter" their stock on grain and/or potato by-products and hay of inferior quality.
International Quality Assurance Services (IMQAS)	IMQAS services the hygiene and quality needs of the meat industry in South Africa on an independent basis. Their services

Stakeholder	Description
	are available to primary producers, abattoirs and processing establishments.
South African National Halaal Authority (SANHA)	SANHA is a non-profit organisation promoting professionalism in the certification of Halaal products.
South African Pork Producers' Organisation (SAPPO)	SAPPO is the official association of pork producers in South Africa. The organisation is primarily concerned with administration, liaison with government, the promotion of pork and pork products and matters of national interest such as health and research.
Red Meat Research & Development SA	The specific aim of the RMRD SA and its Project Committee is to co-ordinate and fund research projects.

8.9 Technology

Agri-Park farmers can make use of a wide variety of technology to improve their access to markets and the efficiency of their production. Emerging farmers in South Africa have traditionally lagged behind in the usage of technology in their production and marketing activities. There is however more information and initiatives available today to connect emerging farmers with the latest technology. The areas in which innovation is improving efficiencies in small holder agriculture include nanotechnology, genetically modified crops, GIS and remote sensing, cellular phones, marketing information systems, information technology and applications etc. As with any technology, it is important to strike a balance of mechanisation and job creation which improves skills and creates meaningful jobs.

To farm and manage livestock various equipment and infrastructure will be needed such as management and farming software, boreholes, water pumps and storage, handling, feeding, watering & health equipment and training, veld management techniques to prevent soil erosion, security technology, and other innovations.

Recent developments in farming will have to be considered in order for any farming activity to be competitive in the future. Three areas in which technology is impacting on the livestock industry is in animal health practices, veld management and automated refilling water troughs.

8.9.1 Animal Health

Animal health practices are important in livestock farming to guarantee the survival of the animal and the quality and acceptability of the product for the commercialised market structures. There are two major methods in managing the health of animals: via vaccinations and via anti-biotics. Both of those methods are practiced within commercial operations, however the importance of these activities have not fully penetrated the small-scale market.

Vaccines contains inactive parts (usually the capsid) or molecules that resembles surface proteins of a pathogenic virus or bacterium, which are introduced into the animal's blood stream so that antibodies can be developed. This will enable the animal to develop immunity and to be protected against the pathogen when and if exposed to it later in life. New vaccines are constantly developed therefore it is important to consult with an animal health professional on the most appropriate vaccination program. Vaccines have a highly positive effect on disease control and even eradication. Vaccinated animals normally exhibit high returns on investment, as there is less likelihood of losing the animal during the raising process. Costs associated with vaccination are normally low, and they require low levels of training to implement successfully.

Anti-biotics have two main applications in agriculture. The first is to treat infections, which is an important application, but too specialised a feel to discuss in detail. Infection treatments are predominantly taken care of by animal health professionals. Secondly, anti-biotics serve as a routine feed supplement to animals in intensive farming systems (feedlots, piggeries, chicken houses, fisheries etc.) which can be considered a dangerous and unsustainable practice. This second method occurs as anti-biotics encourage increased growth rates and resistances against disease. However, the cost to society could be large and devastating, due to extensive untested treatment of medication to animals not necessarily requiring prolonged exposure to the chemicals. Prolonged exposure to the anti-biotics encourage drug resistance strains to develop that can potentially be carried over to the human population via consumption. The drugs are cheap to acquire, however to correctly implement, via the trained veterinary profession, does require substantial service charges.

8.9.2 Veld Management

Veld management practices serve two primary functions. Firstly, they prevent the encroachment of indigenous bush onto grazing areas, and, secondly, they enable land rehabilitation to other purposes. Two ways in which this can occur is by bush removal for input into related markets, and land rehabilitation practices.

A good example of brush removal is the potential contained within bush-to-feed converters. Brush removal enables production feed pellets from shrubs and trees. It also enables minor forestry production with thick branches and tree stems that cannot be converted into feed, can be sold as fire wood or converted to biochar. The practice is centred on converting a liability (bushes that reduce the carrying capacity of the veld) into a valuable asset (feed for game and cattle). And could serve as an effective method of bush encroachment control. The process requires some skills training and is moderately expensive to obtain and operate.

Land rehabilitation covers a range of technological processes, that can differ in complexity from as simple as brush packing to as complex as production of biodegradable or long lasting soil cloths and mesh materials. The main purpose of the rehabilitation is to stabilise soil, control or reverse existing erosion damage and restore degraded land so that it can again be utilised for agricultural purposes. Land rehabilitation also serves as a preventative measure for future soil degradation, by enabling vegetation on the land, preventing future problems. Depending on the type, extent and location of re the rehabilitation, the required expenditure skills range from low to moderately high.

8.9.3 Automated-refill watering troughs

Providing water for livestock can be a drain on communal water resources and put unnecessary strain on communities, especially in times of drought. If animals are scattered in rural areas, it may be time consuming or difficult to access their water troughs to keep refilling them. Automated-refill water troughs seek to manage livestock water usage, by utilising water troughs fitted with a small reservoir and low pressure floating valves to enable automated re-filling.

These water-provision systems would be more resilient to evaporation, and when properly maintained ensure sufficient levels of water provision of animals, by minimising water contamination and the risk of wastage. Furthermore, the systems are consistent, preventing livestock tampering, and easy to clean. The cost of the system is relatively low, requiring an investment of a few thousand rand, and are also relatively simple to operate.

8.9.4 ICT

ICT is possibly the biggest development in the agricultural sector for emerging and commercial farmers alike. The emergence of the internet and mobile phones has led to an exorbitant amount of data at the fingertips of the farmers. If they require information then it can be obtained immediately and problems solved sooner than before (e-Agriculture, 2015). ICT has allowed the emergence of training software and applications (Apps) which people can use for the benefit of the staff who work for them and for themselves. Training can be done outside of training centres and content directly displayed on smartphones. Smartphones have also allowed for greater access to market prices and market related news as it happens and sooner than what used to occur (e-Agriculture, 2015). This can allow farmers to make adjustments before they impacted negatively. This has also allowed access to online and cell phone banking and various finance facilities (e-Agriculture, 2015). This means that farmers have access to their finances from their phones and do not have to leave the farm to bank. Online banking has also made farming safer as large amounts of cash is no longer used to pay staff and instead can be paid into bank accounts or cell phone numbers. ICT has allowed for the effective design of farms around the land that is available to farmers and has allowed for farmers to be more efficient and handle finance and information related queries over a long distance instead of being at a physical location in person. This has also allowed for the effective management and understanding changing markets as they occur which allow farmers to react in a timely manner (e-Agriculture, 2015).

Numerous smartphone apps also exist for the convenience of the farmer. Pantheon Farming from App Lab allows farmers to enter all data directly on location, which is synchronized with a main database. This reduces the possibility of errors and eliminates duplicate data entries. eFarmer is a simple app designed for the agricultural industry that allows users to construct an electronic map of fields to create a database of various crops in the fields. The app also allows users to take notes on the fields as points of interest, keep the location of specific objects on the farm and keep a diary of the operations for each field users own. AgriApp is an Android app that enables farmers to access large pool of relevant information related to agriculture and specific crops and animals.

Specifically for the livestock industry, the Merck Veterinary Manual Mobile App, is available for both Android and Apple and contains guidelines for the diagnosis, treatment, and prevention of animal disorders and diseases.

Online resources also exist which can be accessed through a phone, tablet or PC which is connected to the internet. Sites such as FAO:Ecocrop provides detailed crop requirement information for almost any crop that are cultivated throughout the world, including its uses and requirements for temperature, rainfall/water, soil type, soil depth, soil pH, salinity, altitude etc. It also include hundreds of forage crop species for extensive animal farmers. Another site My Agriculture Information Bank provides a variety of general agricultural information to farmers.

8.9.5 Logistics

In order for the Agri-Park to be successful there needs to be and effective and well run logistics system. Logistics is an extremely important part of agriculture as it relies on transport of goods to and from the farm to the processing facilities and to markets. Trucks and other large freight vehicles which transport goods are vitally important in any industry and is also important in the vegetable industry. Goods need to be transported in such a manner that they are not damaged. If goods need preservation then it is important to consider using refrigerated trucks to transport of produce. The second aspect of logistics is the medium of transport itself. Roads or the rail system need to be in good order and should be well connected in order to reduce the loss of produce and damage to trucks which can add on unnecessary costs to the farmers.

8.10 Demand and Needs Analysis

Opportunities exist for the following in the red meat market:

- Production/supply of animal feed
- Increasing existing capacity and development of new abattoirs
- Development of cattle feedlots
- Increasing herd size of beef cattle
- Long term opportunity for SMME cattle hide processing (tanneries) for the automotive industry

It is possible to provide an estimate for demand based on historical consumption figures and populations. The figure below provides a summary on estimated demand on a national and provincial level.

At an average per capita consumption for red meat of 25.5kg per person (beef at 17.6kg, mutton at 3.3kg and pork at 4.6kg), there is a clear demand for red meat products in South Africa. Demand for red meat on a national level is approximately 1 320 149 million tons. In O.R. Tambo District Municipality the demand for red meat is approximately 34 806 tons.

Table 8.8 – Annual Demand for Red Meat (tons)

Area of Demand	Estimated Demand
South Africa	1 320 149
Eastern Cape	167 332
O R Tambo District	34 806
Ngquza Hill	7 101
Port St Johns	3 981
Nyandeni	7 405
Mhlontlo	4 800
King Sabata Dalindyebo	11 519

Source: Quantec 2013, Census 2011

The figures in Table 8.9 show the value of consumption on red meat annually in South Africa, the Eastern Cape as well as the O.R. Tambo District Municipality and its local municipalities.

Table 8.9 – Annual expenditure on red meat

Area of Demand	Estimated Demand
South Africa	R 419 891 399
Eastern Cape	R 569 235 619
O R Tambo District	R 276 170
Ngquza Hill	R 551 582
Port St Johns	R 163 801
Nyandeni	R 265 399
Mhlontlo	R 425 335
King Sabata Dalindyebo	R 870 053

Source: Quantec 2013

8.11 Socio-Economic Factors

The Agri-Park vision, as discussed in Chapter 2, outlines the importance of socio-economic development as an objective of the Business Plan. Socio-economic progress and development can be measured in various ways, however the primary method of measurement selected for livestock commodity is job creation. Job creation is measured via the use of commodity labour multipliers, measuring the number of jobs created per R1 million

produced in the commodity production process. The three relevant multipliers for the O.R. Tambo District Municipality Red Meat Market are the:

- Direct Multiplier
- Indirect Multiplier
- Induced Multiplier (See Chapter 7)

The direct employment multiplier, is relatively low, with only 2.07 jobs created per million produced. The indirect multiplier is likewise low, at 1.61 jobs, and the induced multiplier is only 1.88 jobs (OABS Development, 2015). Therefore, according to the above, the total job multiplier is 5.56 jobs created per R1 million produced.

The three multipliers measure the total numbers of job created in an ideal economic environment for the Red Meat Market. However as the economic environment diverges away from the ideal environment, so do the multipliers. Livestock farming is not as labour intensive at small-scale production levels as something like maize production in the district, however, the cattle commodity specifically does have an extensive value chain with job opportunities at production, processing, retailing and service level. O.R. Tambo District Municipality does not engage in large scale processing for red meat in the current environment, with only one abattoir currently located in Mthatha. Job multiplication in the current environment can be expected to marginally higher, as a result of the numerous small-scale producers in the region each requiring their own staff. Alternatively, due to the already established abattoir, indirect job multipliers can be expected to be marginally lower, until the need for additional abattoirs arise. Induced job creation from the income already received in the direct and indirect multiplier phases, however, could be increased, due to the receptiveness of the area to low-income earners.

Information that is available on the District's livestock production and the potential number of hectares, together with the Bureau for Food and Agriculture Policy, have been used to estimate the employment opportunities that livestock production can contribute in the 10-year period. The Agri-Park can provide approximately 270 employment opportunities from the programme. It must be noted however that these figures are purely indicative and will change through the development of the Agri-Park.

8.12 Contribution to Food Security

DAFF launched a Zero Hunger Policy in 2012 in order to curb poverty and improve food security for vulnerable communities who are in need of support. The Zero Hunger Policy was created to uphold Section 27,1 (b) of the bill of rights which states that every citizen has the right to food and water and Section 28,1 (b) which states that every child has the right to basic nutrition shelter and basic care and social services. The policy suggest that adult daily calorie should be 1792 kcal (7502kj) per day for an adult and sets a food poverty line of R260 per individual expenditure for food every month (DAFF, 2002). Meat consumption is based largely on availability, price and tradition. Meat production is a very complex operation depending not only on demand (which is usually based on price and income) but on many social and economic influences such as official policy, price support mechanisms, and interrelations such as the interaction between beef and milk production etc. (FAO, 2002). While it is clear that meat is not essential in diets the inclusion of animal products makes it easier to ensure a good diet. Many diets in developing countries are based on cereals or root crops and are relatively bulky, especially where fats are in short supply, and this can limit the total energy intake (FAO, 2002). The importance of meat in the diet is as a concentrated source of protein which is not only of high biological value but its amino acid composition complements that of cereal and other vegetable proteins (FAO, 2002).

Meat is an adequate source of protein in the human diet and it is assumed that between 55g of meat per day provides enough protein. The quality of the meat however plays a role as the lower the quality, the more meat is needed to make up the 55g. Meat and meat products are important sources of all the B-complex vitamins

including thiamin, riboflavin, niacin, biotin, vitamins B6 and B12, pantothenic acid and folacin (FAO, 2002). The last two are especially abundant in liver which, together with certain other organs is rich in vitamin A and supplies appreciable amounts of vitamins D, E and K. Meats are excellent sources of some of the minerals, such as iron, copper, zinc and manganese, and play an important role in the prevention of zinc deficiency, and particularly of iron deficiency which is widespread (FAO, 2002).

There are health issues related to the consumption of large quantities of meat leading to an unbalanced diet. This may result in health conditions such as increased risk of coronary disease, high blood pressure and high cholesterol (FAO, 2002).

8.13 Regulatory Requirements

There are numerous legislation documents governing the production of red meat. These range from regulations as to the production inputs (National Water Act), to those governing production (Meat Safety Act) and to production standards and consumption. The most pertinent of the acts are contained in Table 8.10

Table 8.10 – Red Meat Governing Legislature

Act	Description
The Meat Safety Act, 2000 (Act No. 40 of 2000)	The abattoir is responsible for the conversion of livestock to meat. The process remains critical to ensure a safe and wholesome product reaches the consumer. The Meat Safety Act addresses measures to promote the safety of meat and animal products and to establish and maintain essential national standards in respect of abattoirs. Red meat regulations regulate processes and procedures under the Meat Safety Act.
Animal Health Act, 2002 (Act No. 7 of 2002)	To provide for measure to promote animal health and to control animal diseases; to assign executive authority with regard to certain provisions of this Act to provinces; to regulate the importation and exportation of animals; to establish health schemes; and to provide for matters connected therewith.
Animals Protection Act, 1962 (Act No. 71 of 1962)	The act encompasses the prevention of cruelty towards animals. The act further encompasses the code of best practices for the handling and transport of livestock.
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947)	The act provides for the appointment of a Registrar of Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies; for the registration of fertilizers, farm feeds, agricultural remedies, stock remedies, sterilizing plants and pest control operators; to regulate or prohibit the importation, sale, acquisition, disposal or use of fertilizers, farm feeds, agricultural remedies and stock remedies; to provide for the designation of technical advisers and analysts; and to provide for matters incidental thereto.
National Water Act, 1998 (Act No.36 of 1998)	This act encompasses laws relating to water resources and the use thereof.
Occupational Health and Safety Act, 1993 (Act No.85 of 1993)	The act aims to provide for the health and safety of persons at work and the health and safety of persons in connection with the activities of persons at work and to establish an advisory council for occupational health and safety.

Act	Description
Basic Conditions of Employment Act, 1983 (Act No. 3 of 1983)	The act encompasses those regulations associated with fair labour practices.
Municipal By-Laws and Regulations, where relevant	Municipal by-laws will need to be investigated with regard to the establishment of the abattoir in a municipal area.
Marketing Act, 1968 (Act No. 59 of 1968)	The Act has authorised an establishment and enforcement of regulatory measures to intervene in the marketing of agricultural products, including the introduction of levies on agricultural products.
Agricultural Products Standards Act, 1990 (Act No. 119 of 1990)	The act controls and promotes specific product standards from mainly a quality point of view for local as well as export purposes. A list of products for which standards have been set through regulations is promulgated under the act by the minister of agriculture.
Stock Theft Act, 1959 (Act No. 57 of 1959)	This Act encompasses those laws associated with the theft of animal stock and produce.
Consumer Protection Act (Act No. 68 of 2008)	To promote a fair, accessible and sustainable marketplace for consumer products and services and for that purpose establish national standards relating to consumer protection.

Source: Government Gazette (1947; 1959; 1962; 1968; 1983; 1990; 1993; 1998; 2000; 2002; 2008)

8.14 Substitute Products and Services

Substitutes are products that can replace the product that is grown or produced. In the red meat value chain various products can be replaced. Red meat is often substituted by white meat products. This has increased as a result of the price discrepancy between white meat and red meat growth, and the perceived benefits of white meat over red meat (FAO, 2014). Some groups do not eat red meat at all and substitute red meat with vegetable rich diets and with soy based alternatives such as soya-mince (FAO, 2014). There is also a cultural reason for reduced red meat consumption within the Eastern Cape, in that cattle are seen as a symbol of wealth (See Section 8.16).

Products such as leather and hides have been increasingly replaced by cheaper plastic based textiles, with leather increasingly used as a luxury item for textiles and the clothing industry (FAO, 2014).

8.15 Red Meat Barriers to Entry

Barriers to entry are obstacles that make entry into a given market difficult such as regulations, high infrastructure costs or competition in the given area. This section will discuss the barriers to entry of the red meat industry, as presented in Table 8.11.

Table 8.11 – Barriers to Entry: Red Meat

CONSTRAINT	DESCRIPTION	LEVEL OF INFLUENCE
CAPITAL, RAW MATERIALS AND PRODUCTION ISSUES		
Poor carrying capacity	In many parts of the district the natural carrying capacity of the veld has been reduced due to unsound grazing practices (mainly overstocking).	-
Input Costs	There has been an upward trend in input costs, over the last several years particularly feed and electricity. This has an adverse impact on farmers bottom-line.	-

CONSTRAINT	DESCRIPTION	LEVEL OF INFLUENCE
Stock Theft	The theft of stock is an ongoing challenge for both commercial and emerging/small scale farmers.	Provincial, District
Start-up costs	There is a high capital cost associated with setting up fixed structures, installing requisite technology and also the financing of the first production and the initial stock of weaners	-
Poor breeding stock amongst emerging farmers	Poor quality breeding stock and a lack of quality weaners amongst emerging and small scale farmers means that they are not able to improve the overall level of their herd which in turn negatively impacts profits.	Provincial, District
Disease and high mortality rates	The expansion of game farming in the Eastern Cape has resulted in the spread of diseases that affect sheep and goats. Sheep must be dipped regularly to avoid catching diseases. Due to a lack of technical skills, emerging and traditional farmers especially have problems with disease and mortality rates.	Provincial
Availability of land for farming	There are good opportunities for sheep and goat production, however limited land availability. Sheep farming has to compete with ostrich, cattle, and goat farming for production space. The costs and returns on each should be considered sufficiently before engaging in any of the options.	Provincial
INFRASTRUCTURE		
Roads	The poor road network and lack of connectivity within the district hampers the cattle industry, particularly given that animals have to be transported out of the area for finishing.	Provincial, District
Fencing	The lack of fencing leads to an increased incidence of stock losses, theft and poorer quality products. The provincial government does have a programme in place to address the issue of fencing; however the resources of the Department of Agriculture are spread amongst a number of priority areas and are limited.	Provincial, District
COMPETITION AND ACCESS TO MARKETS		
Consumer preference	Red meat production faces stiff competition from poultry meat; per capita consumption in this sector is not rising as fast as in the poultry sector. Within the sector, pork production and consumption are generally growing faster than beef and lamb.	National
International (SADC) competition	Increasing competition from Southern African Development Community (SADC) and international producers with comparative advantage due to subsidies.	-

CONSTRAINT	DESCRIPTION	LEVEL OF INFLUENCE
Compliance with international standards	Meeting international standards of sanitary and quality (especially proving that South Africa does meet the required standards). In short, the challenge is lack of a traceability system and a national quality assurance scheme.	Provincial
Popularity of chevron	Chevron is not as popular as beef or chicken amongst South African consumers which means that it has difficulty in finding a large domestic consumer base. It is a popular export, but the Eastern Cape currently does not contribute.	National

Source: Urban Econ, 2015

8.16 Societal and Cultural Trends

In selection of priority commodities for the O.R. Tambo District Municipality Agri-Hub, key consideration were given to commodities with cultural significance to the rural communities. Beef cattle production remains spatially important and is a multifunctional livelihood strategy in rural South Africa. This is especially true in marginal and remote areas with poor agricultural lands and minimal economic opportunities.

It has been estimated that 5.6 million cattle (40 % of the total cattle population) are owned by 240 000 small-scale farmers and 3 million subsistence farmers. For the livelihoods of these small-scale producers, cattle farming has multiple functions. Non-commercial motives include economic functions (e.g. wealth storage), agro-economic functions (e.g. provision of draught power), agro-ecological functions (e.g. provision of manure), nutritional (e.g. provision of milk for infants) and socio-cultural functions (e.g. dowry) (Ndoro et al., 2014).

The sustainability of cattle-based livelihoods, however, is threatened by the competition for natural resources such as land and water, and decreasing grazing areas. Despite this, cattle production has increased by a million from 1994 to 2004 (Republic of South Africa, 2011). The increase owes to recent developments in breeding, nutrition and animal health that has contributed to potential production, efficiency and genetic gains (Ndoro et al., 2014).

8.17 SWOT Analysis

A SWOT analysis is an examination of the strengths, weaknesses, opportunities and threats of the red meat industry in the O.R. Tambo District Municipality with relation to the Agri-Park. The strengths and weaknesses refers to internal positive and negative factors affecting the growth of the industry; whereas threats and opportunities refer to the external factors affecting the commodity.

8.17.1 Strengths

- **Biophysical Criteria**
  - The temperature and rainfall profile of O.R. Tambo District Municipality suit the production of cattle, sheep and goats
  - The land is capable of carrying livestock used in red meat production
  - Local breeds of cattle and sheep are more resilient to many common diseases and droughts and are suitable for small and emerging farmers
  - Beef cattle are far easier to take care of for an emerging farmer than dairy cattle

- **Enterprise Viability Criteria**
  - Red meat has a fairly open market structure and small and emerging farmers can easily sell their meat to local buyers of the product
  - Red meat is a fairly profitable endeavour and can be very profitable for an emerging farmer
  - Livestock are culturally important to the region, with the region familiar with the animals
  - Finance for this commodity would be fairly easily available
  - Payback period for mutton, lamb and chevon is fairly low and income can be generated in a season
  - Infrastructure requirements are relatively small for new livestock farmers
  - Livestock differentiation and grading methods enable better quality to be priced accordingly before processing
  - Red meat processing facilities process a variety of red meat products (pork, chevon, mutton, and beef).
  - Additional production will assist in meeting supply capabilities of existing abattoirs.
  - Slow production cycles are still rewarded, in that the age of the animal affects price paid, not demand from the abattoir.
  - Population growth has led to increasing consumption of red meat, despite stable per capita consumption.

- **Economic Development Criteria**
  - All livestock classes contribute to the reduction on the reliance of imported meats into the District
  - Indirect and induced job creation for red meat is fairly high as there are many impacts on employment in the local economy

- **Political and Social Criteria**
  - Government departments and the O.R. Tambo District Municipality are already active in supporting commercial and emerging farmers in the area
  - State and communal land is already being used for projects run by the government
  - Livestock farming is highly suitable for communities and emerging farmers
  - Livestock farming contributes greatly to food security in the O.R. Tambo District Municipality and Eastern Cape as a whole
  - Local breeds of animals should make the project more acceptable and more resilient thus it will be sustainable in the long run

8.17.2 Weaknesses

- **Biophysical Criteria**
  - Introduction of game animals has brought new diseases into the area

- **Enterprise Viability Criteria**
  - The main livestock farming areas have poor connectivity and poor internal roads
  - Current demand for chevon meat is very low locally
  - The payback period for beef is longer than that of chevon, mutton or lamb
  - Modern, efficient production techniques are not in use in the district.
  - Restricted access to abattoirs for red meat processing, with one abattoir in Mthatha.
  - Per capita consumption of red meat has remained relatively stable between 2003/04 and 2013/14, while per capita white meat consumption has increased considerably.

- Small-scale livestock farmers do not produce guaranteed quality livestock necessary for meat production.

- **Economic Development Criteria**
  - On-farm job creation for cattle and sheep farming is very limited. There are not many opportunities for employment
  - The jobs that are on offer are relatively low skilled and do not contribute significantly to skills development.
  - Cattle and sheep farming to do not contribute significantly to the local GDP
  - Poor quality breeding stock and a lack of quality weaners amongst emerging and small-scale farmers means that they are not able to improve the overall level of their herd which in turn negatively impacts profits.

- **Political and Social Criteria**
  - Suitable state land is not readily available throughout the District and may be an issue if there is a will to expand the red meat industry in the area

8.17.3 Opportunities

- **Biophysical Criteria**
  - The suitability of the land area gives opportunities to expand the red meat industry at an emerging or commercial scale

- **Enterprise Viability Criteria**
  - Current demand for red meat is fairly high and has outstripped production in the local markets
  - The future market growth potential is expected to be higher than current figures so there is an opportunity to expand red meat production
  - National shortage of 340 000 head of cattle
  - Feedlots can be centralised to processing facilities, enabling small-scale producers access to finishing facilities before slaughter
  - There is a growing market for better quality meat at a premium price, due to consumers seeking healthier lifestyles
  - Large numbers of cattle and goats kept for cultural purposes encourage processing opportunities in the district.
  - Livestock farmers have been encouraged to cull herds, increasing market supply over the short term, due to a drought in the interior, enabling local production with less completion

- **Economic Development Criteria**
  - Good opportunities exist for agglomeration in the District specifically for small-scale and subsistence farmers to enter the O.R. Tambo District Municipality red meat market
  - Opportunities exist for the expansion of agro-processing at a district level through initiatives such as packaging, rendering, etc.
  - Chevon export opportunities into Africa
  - Red meat exporting opportunities into Asia, as long as correct standards and procedures are followed
  - Potential for small suppliers to access niche markets such as hotels, lodges and restaurants
  - The expanding retail market in Mthatha and O.R. Tambo is likely to open up more opportunities for the meat supplier.

- **Political and Social Criteria**
  - Increased potential for emerging farmers to compete in the agricultural sector
  - Increased opportunity for

8.17.4 Threats

Biophysical Criteria

- The Eastern Cape has a history of disease among livestock. This is exasperated by the rural environment and poor fencing in the district.
- Climate change poses a significant threat to the agriculture sector particularly in terms of rainfall and access to water, via changing livestock grazing conditions
- Carrying capacity of the land has been reduced due to poor farming practices (mainly overstocking)

- **Enterprise Viability Criteria**
  - There has been an upward trend in input costs, over the last several years particularly feed and electricity. This has an adverse impact on farmers bottom-line.
  - There is a high capital cost associated with setting up fixed structures, installing requisite technology and also the financing of the first production and the initial stock of weaners
  - Cultural and historical traditions, specifically regarding the multi-use purpose and symbol of wealth, concerning livestock can hinder production potential
  - Livestock shortages, particularly in periods of drought, may hinder the growth of the abattoir and processing facility.
  - The AGOA agreement encourages large-scales of low-costing imports into South Africa, which is likely to adversely affect red meat consumption.

- **Economic Development Criteria**
  - The poor condition of the road network and lack of connectivity to some areas within the district hampers the development of the red meat industry, particularly given that animals have to be transported out of the area for finishing.
  - Red meat production faces stiff competition from poultry meat; per capita consumption in this sector is not rising as fast as in the poultry sector. Within the sector, pork production and consumption are generally growing faster than beef and lamb.
  - Increasing competition from Southern African Development Community (SADC) and international producers with comparative advantage due to subsidies.
  - Meeting international standards of sanitary and quality (especially proving that South Africa does meet the required standards). In short, the challenge is lack of a traceability system and a national quality assurance scheme.
  - A large-scale supplier could supply or integrate with a local abattoir, locking out small-scale producers

- **Political and Social Criteria**
  - The theft of stock is an ongoing challenge for both commercial and emerging/small-scale farmers.

Maize

Chapter 9

9. MAIZE

9.1 Commodity assessment

The following commodity assessment builds upon the maize commodity identified within the previous chapter. As per the outcomes of the commodity prioritisation matrix, maize has been identified for development.

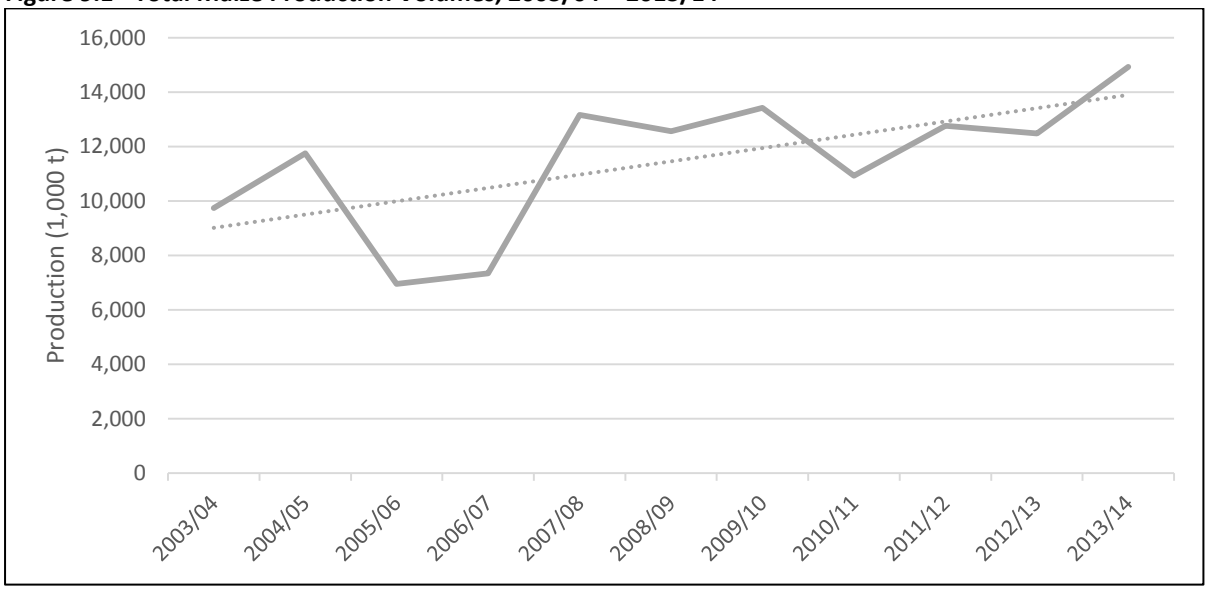
Maize is one of the most important grain crops in South Africa and is the staple food of a large portion of the population. The South African maize industry was deregulated in 1997 and is operating in a free-market environment where producers sell to whomever they wish and the prices are determined by supply and demand.

9.1.1 Production

Maize is produced throughout the country in various environments. The production is dependent on rainfall that exceeds 350 mm per year.

Figure 9.1 provides an overview of the production of maize in South Africa between 2003/04 and 2013/14.

Figure 9.1 - Total Maize Production Volumes, 2003/04 – 2013/14

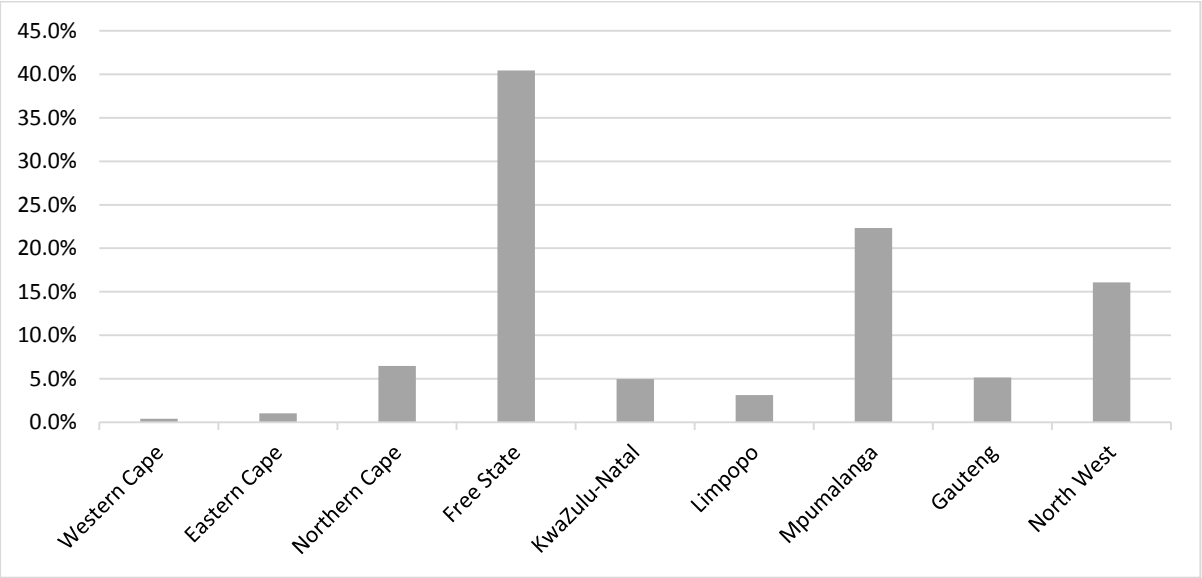


Source: DAFF (2015A)

The total maize production for 2013/14 was 14,925,000 tons. The production volume increased by 19.5% between 2012/13 and 2013/14.

Figure 9.2 indicates the maize production per province throughout South Africa for 2014/15.

Figure 9.2 - Maize Production per Province, 2014/15

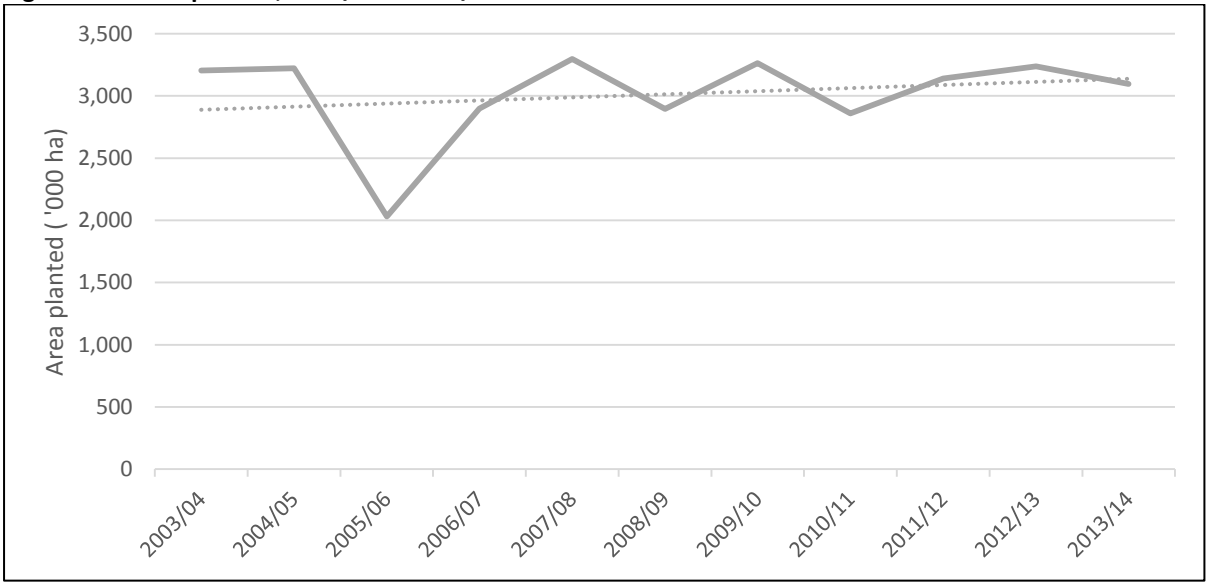


Source: DAFF (2015A)

The three provinces that made the largest contribution to maize production in South Africa in 2014/15 were the Free State (40.5%), Mpumalanga (22.3%) and the North West Province (16.1%). These three provinces together contributed a total of 78.9% of South Africa's maize production.

Figure 9.3 indicates the area planted within South Africa for the period 2003/04 to 2013/14.

Figure 9.3 - Area planted, 2003/04 – 2013/14

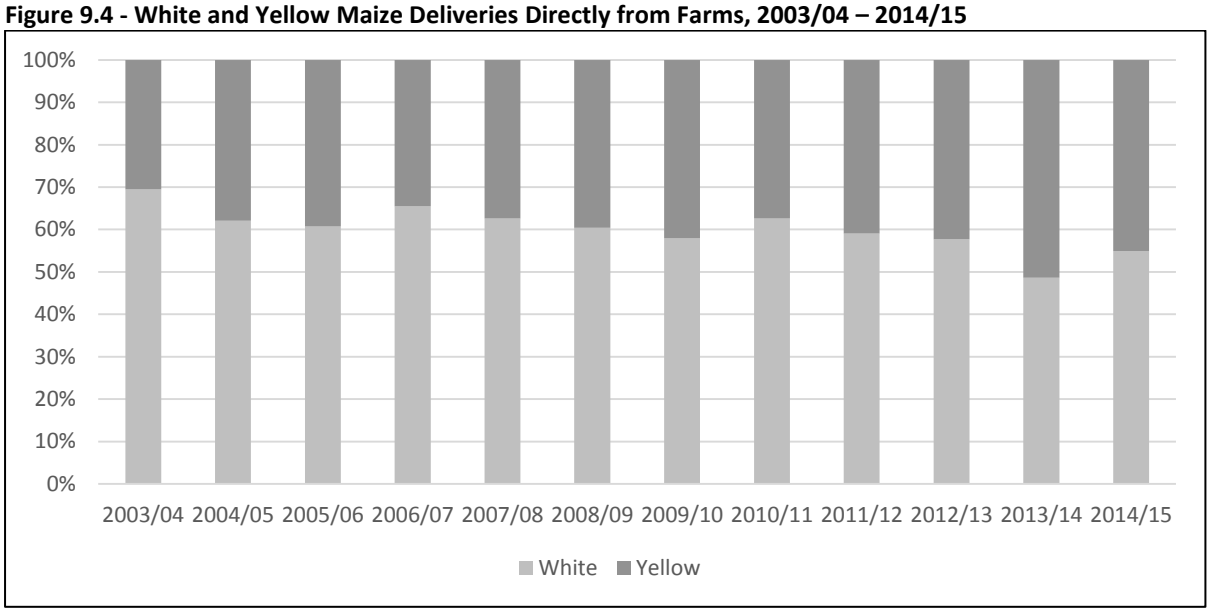


Source: DAFF (2015A)

Between the period 2003/04 to 2013/14, the area planted stayed fairly constant between around 2,800,000 ha and 3,300,000 ha except for 2005/06 when it was at a low of 2,032,000 ha. The area planted in 2013/14 was 3,096,000 ha.

Figure 9.4 provides an overview of the split between white and yellow maize that was delivered directly from farms in South Africa for the period 2003/04 to 2014/15.

Figure 9.4 - White and Yellow Maize Deliveries Directly from Farms, 2003/04 – 2014/15



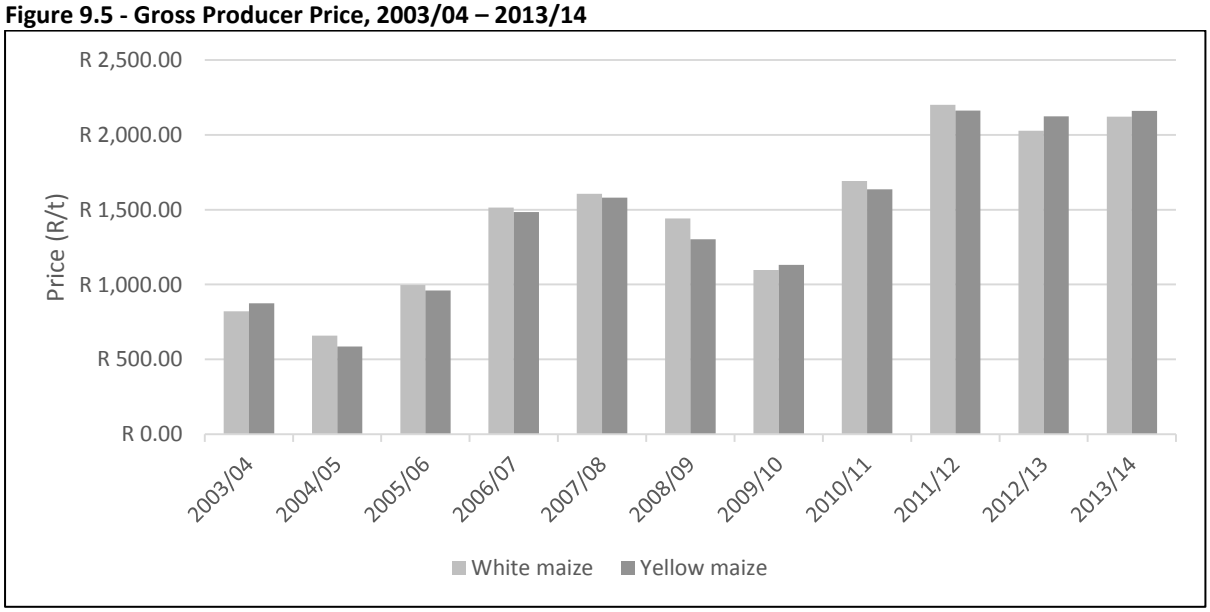
Source: South African Grain Information Service, 2015

There has been a noticeable change in the split between white and yellow maize. In 2003/04, 70% of maize was white maize, while 30% was yellow maize. The contribution of yellow maize has increased over the years to such an extent that in 2013/14 yellow maize contributed 51%. In 2014/15 55% of maize was white maize, while 45% was yellow maize.

9.1.2 Price

Figure 9.5 indicates the gross producer price for white and yellow maize between 2003/04 and 2013/14.

Figure 9.5 - Gross Producer Price, 2003/04 – 2013/14

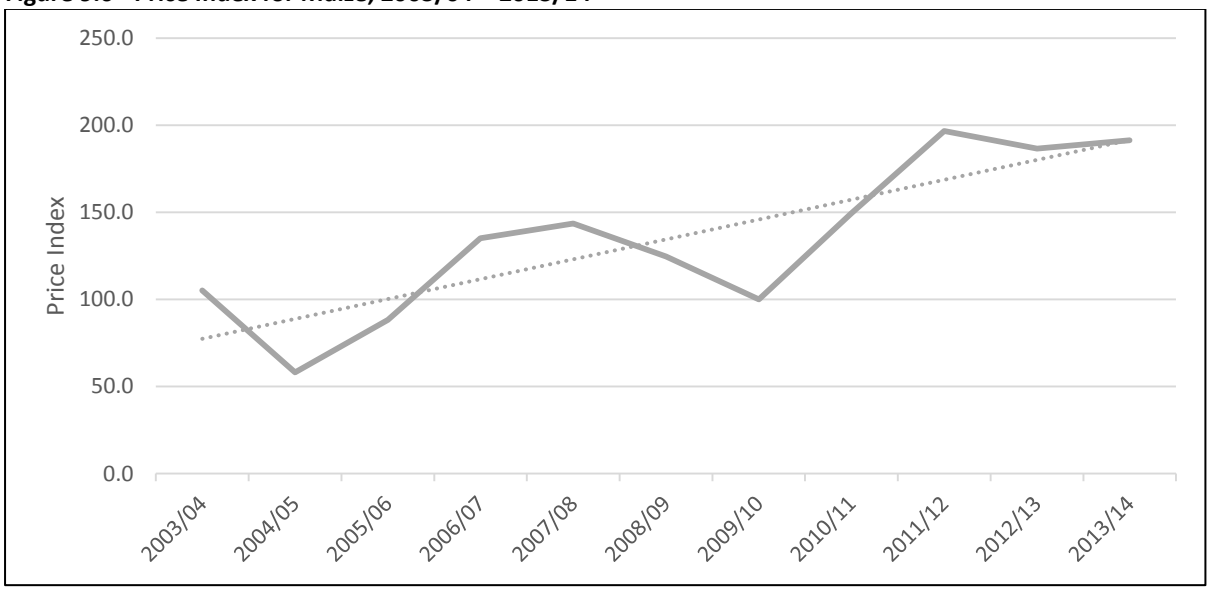


Source: DAFF (2015A)

The gross producer price for white maize was R 2,122 per ton in 2013/14 and R 2,160 per ton for yellow maize.

The following figure indicates the price index for maize between 2003/04 and 2013/14.

Figure 9.6 - Price Index for Maize, 2003/04 – 2013/14



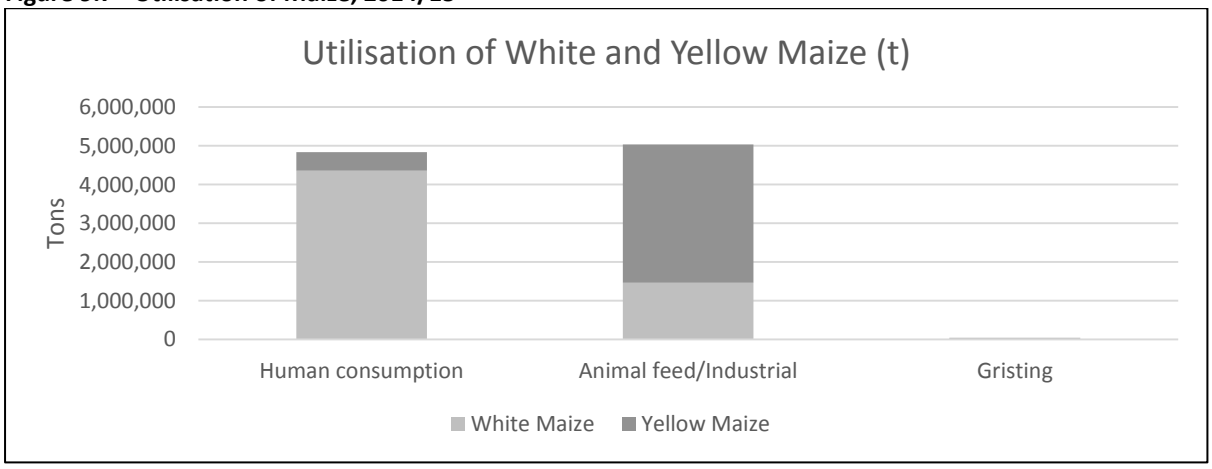
Source: DAFF (2015A)

From Figure 9.6 it is evident that the price for maize has increased by an average of 6.2% per annum between 2003/04 and 2013/14. The price index stood at 191.5 in 2013/14.

9.1.3 Utilisation & Consumption

Figure 9.7 provides an overview of the utilisation of maize that was processed for the local market in 2014/15.

Figure 9.7 - Utilisation of Maize, 2014/15

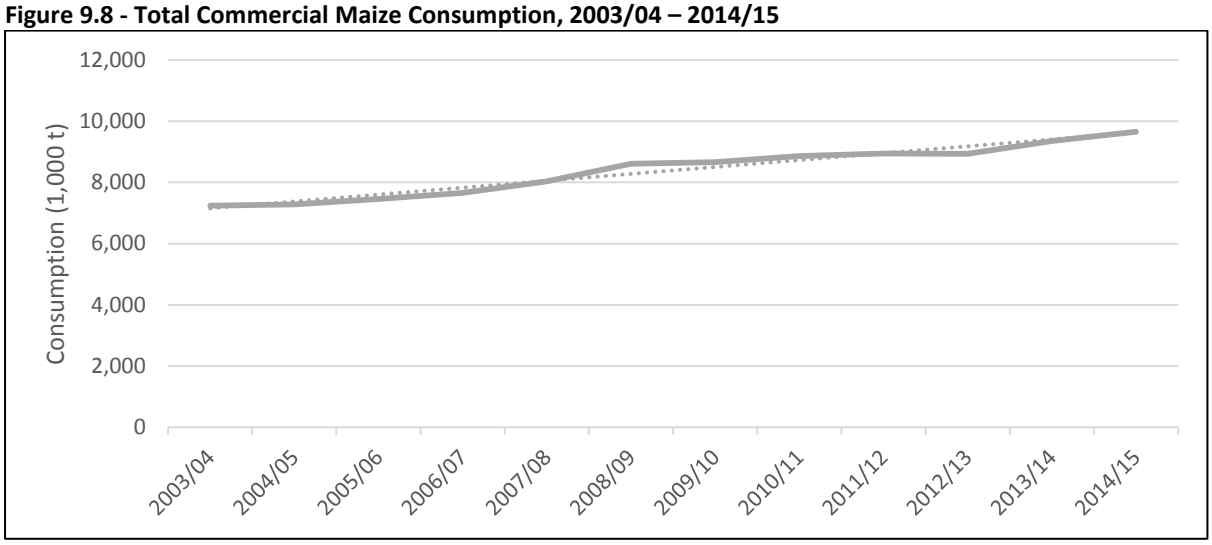


Source: South African Grain Information Service, 2015

The majority of maize (50.8%) is utilised for animal feed or industrial uses, while 48.8% is utilised for human consumption (maize processed for drinkable alcohol included). Only 0.5% of maize was utilised for gristing and no maize was utilised for biofuel. The majority of white maize was utilised for human consumption, while the majority of yellow maize was utilised for animal feed or industrial uses.

Figure 9.8 shows the total commercial maize consumption in South Africa between 2003/04 and 2014/15.

Figure 9.8 - Total Commercial Maize Consumption, 2003/04 – 2014/15

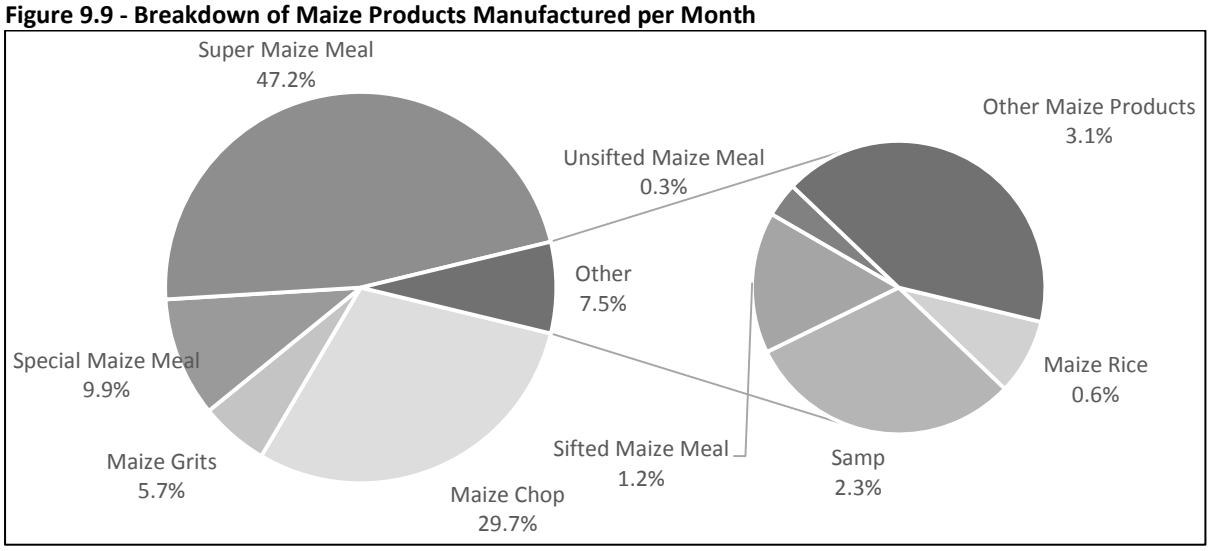


Source: DAFF (2015A)

South Africa has seen a steady increase in the amount of maize consumed with an average increase of 2.9% per annum between 2003/04 and 2014/15. In 2014/15, a total of 9,659,000 tons of maize was consumed.

Figure 9.9 indicates the breakdown of the various maize products manufactured per month based on the average between July and September 2015.

Figure 9.9 - Breakdown of Maize Products Manufactured per Month



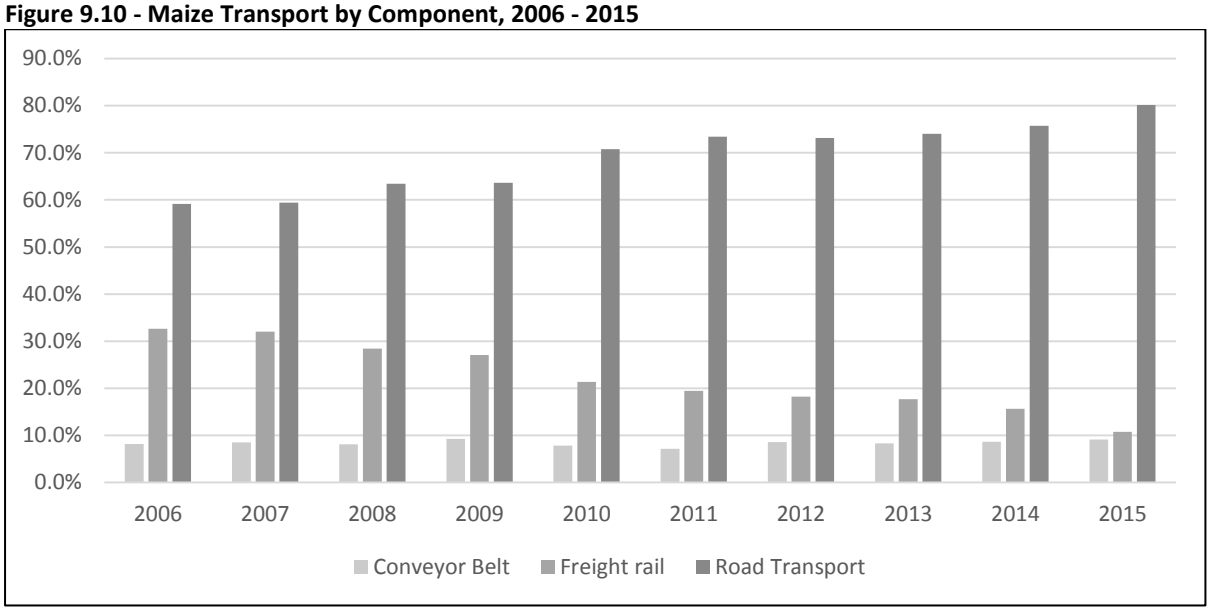
Source: South African Grain Information Service, 2015

The top maize products manufactured are Super Maize Meal (47.2%), Maize Chop (29.7%), Special Maize Meal (9.9%) and Maize Grits (5.7%).

9.1.4 Transport

Figure 9.10 indicates the means by which maize was transported in South Africa between 2006 and 2015.

Figure 9.10 - Maize Transport by Component, 2006 - 2015

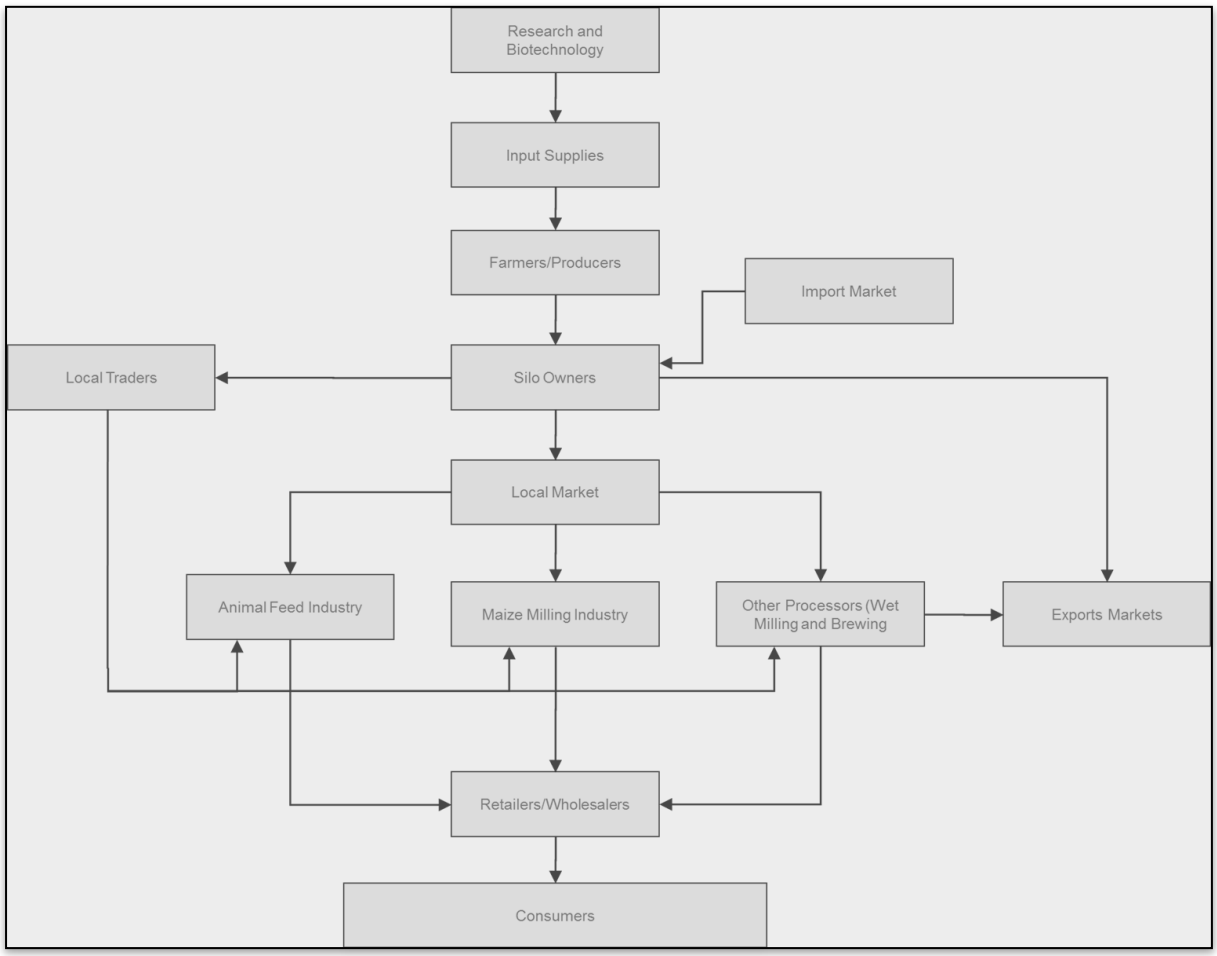


Source: South African Grain Information Service, 2015

The percentage of maize transported by road has increased from 59.2% in 2006 to 80.1% in 2015, conversely, the percentage of maize transported by freight rail has decreased from 32.7% in 2006 to a mere 10.8% in 2015. The percentage of maize transported by conveyor belt has stayed fairly constant fluctuating between 7.2% and 9.3% over the period.

9.2 Maize Value-Chain Analysis

Figure 9.11 - Maize Value Chain



Source: Urban-Econ (2015)

9.2.1 Upstream activities

As Maize production is classified as primary production the upstream activities relevant to the value chain are primary the input supplies used in the production system. The major inputs for maize production include seed, fertilising, weed and pest control, machinery equipment as well as knowledge. Most of these inputs are supplied by Agricultural Co-operatives in the respective areas. The Eastern Cape Province has three major Agricultural Co-operatives namely:

- OVK – TRADE
- Humansdorp Ko-op
- East Cape Agri – Co-op Ltd / BKB LTD

9.2.2 Primary production activities

Experts suggests that the Eastern Cape has the potential to produce 1.2-million tons of maize a year. In Grain SA's revised crop estimate for the 2015-16 season, it is estimated that the current drought situation might lead to SA having to import an estimated 1.29-million tons of maize this year. The traditional and state land policy in former homelands is "communal tenure", which refers to the system in most rural African communities that

expresses an order of ownership and access to regulate the use and transfer of land. The rights to use the land are regulated by the chiefs or customary law.

Production figures indicate that Eastern Cape farmers have the potential to participate in mainstream commercial maize farming. The NCE figures indicate that in 1990 the Eastern Cape's maize production was 62,000 tons and 111,000 in 2014, a growth of 79%. This growth can be attributed to improved agricultural practices and technological improvements, but most importantly, to the contribution made by organised agriculture. When facing situations such as the current drought, where 75% of SA's maize production is at risk, the Eastern Cape farmers are enjoying fairly stable climatic conditions allowing for acceptable production levels. The agro-ecological base of the Eastern Cape, while prone to degradation, is fairly robust. In 2003, the Eastern Cape Department of Agriculture estimated that the province had approximately 500 000 hectares of moderate to high potential, rain-fed cropland available for development while only 15 000 hectares was under production.

9.2.3 Downstream activities

It is estimated that the Eastern Cape has the potential to produce 1.2 million tonnes of maize per annum. In a typical year, Eastern Cape-based maize millers purchase 15 000 tonnes of maize grain and 80 to 90 percent of this is sourced outside the province. If maize grain could be produced in the Eastern Cape and delivered to local millers at below the cost of intra- provincial imports, maize meal prices for local consumers may be reduced. This could have a strong impact on reducing poverty since the ultra-poor in South Africa spend more than 50 percent of their monthly income on food. Of this amount, approximately 20 percent is spent on maize meal (Traub and Jayne, 2006).

Opportunity for storing (silos), milling (animal feed and maize meal for human consumption) and processing to various alternative produce. Packaging, transporting and branding are important requirements. Require sufficient supply - economies of scale. Require high level management capacity.

It should be noted that there are various mills in East London and should be taken in consideration before establishing new facilities. There are two maize ECRDA RED Hubs in the O.R. Tambo District Municipality, located at Lambasi and Mqanduli.

9.3 Competitors

The maize sector in O.R. Tambo District Municipality is not well-established. Competition from commercial farmers within the district should therefore be low. The implications of this is that the O.R. Tambo District Municipality production has easy access via the Agri-Park to the RED Hub maize processing facilities at Lambasi, that will assist in penetrating the local market to meet the demand for maize within the district. The largest form of competition will come in the form of cheaper imports of poultry from the USA as part of the AGOA act that was recently amended.

9.4 Stakeholders

There are a number of organisations involved in the maize value chain in South Africa. One of the key organisations is Grain SA. Grain SA is a voluntary association that provides commodity strategic support and services to South African grain producers to support sustainability. Table 9.1 shows other key stakeholders in the maize sector in South Africa.

Table 9.1 – Maize Sector Stakeholders

Stakeholder	Description
Marketing/Trade	
SA Grain Information Service (SAGIS)	SAGIS is a section 21 company founded in November 1997, after the deregulation of agriculture in South Africa, to provide certain agricultural industries with vital marketing information.
Industry bodies	
AFMA (Animal Feed Manufacturers Association)	AFMA represents the animal feed industry on various committees and platforms where it is necessary to enhance or protect the interests of Industry.
GOSA (Grand Handling Organisation of Southern Africa)	The main objective of this organisation is to create an environment in which all institutions and individuals who are directly involved in the handling, storage, marketing, financing, distribution and processing of grain and related industries can fulfil their roles effectively.
NCM (National Chamber of Milling)	NCM is a trade association not for gain, representing the interest of the South African flour and maize milling industry. The organisation promotes, encourages and assists in the common interest of the milling industry in South Africa.
Industry trusts	
Maize Trust	The Maize Trust provides funding for the benefit of the maize industry in South Africa and more specifically to financially support market- and production-related scientific and/or technical research in respect of maize and market access in respect of South African maize.
Grading equipment	
Ronin Grain Management Services	Ronin Grain Management Solutions supplies grain management system solutions, analytical grading equipment and grain handling services to the Southern African Grain Handling and Storage Industry.
Laboratories	
SA Grain Laboratory (SAGL)	This non-profit company delivers market driven analytical laboratory services.
International grain industry bodies	
Grain Elevator and Processing Society (GEAPS)	GEAPS has dedicated itself to becoming the Knowledge Resource of the Grain Handling Industry through its strategic plan, and the Core Competencies that GEAPS developed to define those areas of skills and technologies that are most relevant to GEAPS members and their industry.
World Grain	The Grain and grain processing information site

Source: AgbizGrain, 2015

9.5 Technology

Agricultural research and technological innovation have been attributed to the African continent's higher than expected agricultural productivity rate (at 1.8%) over the last three decades (Juma, 2011). Small holder farmers linked to the Agri-Park will have an opportunity to make use of leading technology to support the production, marketing, logistics and processing of their commodity. Maize as with other commodities has benefited from

developments in genetics, nanotechnology, GIS and remote sensing, information systems and communication technology.

The basic equipment required by farmers involved in the Agri-Park, to produce maize will include tractors, trailers, ploughs, planters (seeds), irrigation, fencing, basic farming implements (spades, hoes etc.) and trucks or Light Delivery Vehicles (LDVs) for transporting goods.

Recent developments in farming will have to be considered in order for any farming activity to be competitive in the future. Two such major considerations must be acknowledged for maize industry, this is mechanisation and farm energy.

9.5.1 Mechanisation

Mechanisation is the process of using agricultural machinery to industrialise work in the agricultural sector, leading to increased farm productivity. The advancements in mechanisation for maize have been:

- New generation small hand tools
- Small-scale implements and tractors: New generation of farming implements and tractors tailored for small-scale farming

Many farming activities, especially repetitive day-to-day work, can be greatly enhanced by hand tools designed for the particular task, speeding up production and reduce health and safety risk. This is especially suited to small-scale farmers. Farmers benefit from modern mechanisation and large leaps in productivity even though they farm at small scale, and at a much lower cost compared to conventional implements used by large commercial farmers. The cost of small-scale implements and tractors may be high enough to prohibit small-scale farmers.

9.5.2 Farm Energy

This refers to new sources of energy being incorporated in the agriculture process, this includes renewable energy. The advancements in farm energy in relation to maize has been:

- Wind energy: Wind energy has been used for a long time in South Africa in the form of wind pumps. New generation wind technology allows for uses beyond wind driven water pumping, including electricity generation at micro or farm level scale.
- Solar technology incl. photovoltaic and thermal panels and solar drying and cooking: There are two main forms of solar energy harvesting, i.e. photovoltaic panels that produces electricity, and thermal solar panels or tubes that heat water. Solar energy is also widely used on farms for solar drying and solar cooling.

Wind is a renewable form of energy and some areas in South Africa do have sufficient wind development potential, especially when micro-climatic and small-area topographic factors are considered which is appropriate for very small-scale operations. Wind energy is also less vulnerable to theft compared to solar panels. Solar is a renewable form of energy that should be considered if wind development potential is not sufficient.

Other technological advancements in the maize sector that should be considered for the Agri-Park are:

- Recombinant DNA technology and genetic modified varieties: The process of natural selection by traditional breeders can be accelerated by deliberate insertion of genes that code for a particular trait into the host organism, thereby it is possible to develop crop varieties that have more desirable traits.

- No-till or conservation tillage: Land preparation for crop production without tilling the land at all, or just partially breaking up of the soil.
- Remote sensing: Interpreting satellite images to make farming decisions. Satellite images provide valuable information on biomass production, soil and air mass temperature, soil moisture, plant stress levels, fire warnings etc.
- Integrated weed and pest management incl. biological control agents: Pests and weeds are major threats to farmers and food security. Chemical control has been effective for some pests and diseases but it is expensive and causes harm to human health and the environment. Consumers and governments locally and to export markets place increasing pressure on farmers to adopt integrated management practices to reduce reliance on only chemical control. Especially important is biological control where the natural enemy of the weed or pest are released locally to control population levels. It is not only applicable to crop farmers but to all extensive and semi-intensive animal farmers as well (pasture or veld management).

Recombinant DNA technology and genetically modified varieties can lead to large gains in traits such as drought, salt, pest, pathogen or herbicide tolerance, superior yields, nitrogen uptake ability, taste and texture etc. It is particularly important to sustain future expanding populations and to compensate for climate change effects such as drought and salt tolerance, nitrogen metabolism and even fixation, herbicide tolerance (to facilitate weeding, a major agricultural problem) and general yield improvements. No-till conservation tillage can have significant cost savings in terms of diesel, increased moisture retention and reduced soil erosion. Remote sensing enables the farmer to make well informed decisions based on information that otherwise would have been too difficult or expensive to obtain. It provides complete information of the entire farm and some information is provided daily or instantly. Integrated weed and pest management is generally more effective and sustainable than chemical control on its own (Maastraat, 2015).

9.5.3 ICT

ICT is possibly the biggest development in the agricultural sector for emerging and commercial farmers alike. The emergence of the internet and mobile phones has led to an exorbitant amount of data at the fingertips of the farmers. If they require information then it can be obtained immediately and problems solved sooner than before (e-Agriculture, 2015). ICT has allowed the emergence of training software and applications (Apps) which people can use for the benefit of the staff who work for them and for themselves. Training can be done outside of training centres and content directly displayed on smartphones. Smartphones have also allowed for greater access to market prices and market related news as it happens and sooner than what used to occur (e-Agriculture, 2015). This can allow farmers to make adjustments before they impacted negatively. This has also allowed access to online and cell phone banking and various finance facilities (e-Agriculture, 2015). This means that farmers have access to their finances from their phones and do not have to leave the farm to bank. Online banking has also made farming safer as large amounts of cash is no longer used to pay staff and instead can be paid into bank accounts or cell phone numbers. ICT has allowed for the effective design of farms around the land that is available to farmers and has allowed for farmers to be more efficient and handle finance and information related queries over a long distance instead of being at a physical location in person. This has also allowed for the effective management and understanding changing markets as they occur which allow farmers to react in a timely manner (e-Agriculture, 2015).

Numerous smartphone apps also exist for the convenience of the farmer. Pantheon Farming from App Lab allows farmers to enter all data directly on location, which is synchronized with a main database. This reduces the possibility of errors and eliminates duplicate data entries. eFarmer is a simple app designed for the agricultural industry that allows users to construct an electronic map of fields to create a database of various crops in the fields. The app also allows users to take notes on the fields as points of interest, keep the location of specific

objects on the farm and keep a diary of the operations for each field users own. AgriApp is an Android app that enables farmers to access large pool of relevant information related to agriculture and specific crops and animals.

Specifically for the livestock industry, the Merck Veterinary Manual Mobile App, is available for both Android and Apple and contains guidelines for the diagnosis, treatment, and prevention of animal disorders and diseases.

Online resources also exist which can be accessed through a phone, tablet or PC which is connected to the internet. Sites such as FAO:Ecocrop provides detailed crop requirement information for almost any crop that are cultivated throughout the world, including its uses and requirements for temperature, rainfall/water, soil type, soil depth, soil pH, salinity, altitude etc. It also include hundreds of forage crop species for extensive animal farmers. Another site My Agriculture Information Bank provides a variety of general agricultural information to farmers.

9.5.4 Logistics

In order for the Agri-Park to be successful there needs to be and effective and well run logistics system. Logistics is an extremely important part of agriculture as it relies on transport of goods to and from the farm to the processing facilities and to markets. Trucks and other large freight vehicles which transport goods are vitally important in any industry and is also important in the vegetable industry. Goods need to be transported in such a manner that they are not damaged. If goods need preservation then it is important to consider using refrigerated trucks to transport of produce. The second aspect of logistics is the medium of transport itself. Roads or the rail system need to be in good order and should be well connected in order to reduce the loss of produce and damage to trucks which can add on unnecessary costs to the farmers.

9.6 Demand and Needs Analysis

Maize is a critically important agricultural product for South Africa both for its use as food and as a major input into the red and white meat value chains in the form of animal feed. Maize is produced throughout the country in various environments. The production is dependent on rainfall that exceeds 350 mm per year and is very susceptible to drought. Low rainfall figures and other adverse weather conditions experienced during the critical points of the growing season can see maize production levels for a season drop drastically worsening food-security and – through its various value-chain linkages – result in a sharp rise in food prices, particularly in the prices of meat.

Much of this vulnerability is due to maize growing being centred in the Free State, Mpumalanga and North West provinces. Increasing the production of maize in other parts of the country will assist in sheltering the maize market, and other agricultural markets, from this risk.

Maize is grown in South Africa primarily for local consumption. Production of both white and yellow maize has increased steadily over the past decade and expectations are that demand for maize will remain strong across the country in the medium to long term.

It is recommended that maize is marketed collectively in the ADM and that the Agri-Hub acts as a silo business. In the short-term the most promising channels will be to supply to existing silos and/or to sign forward contracts with large feedlots, piggeries and poultry producers that are situated as near as possible to the production areas. It is possible to provide an estimate for demand based on historical consumption figures and populations. The figure below provides a summary on estimated demand on a national and provincial level.

At an average per capita consumption of maize at 82.13kg, there is a clear demand for maize and maize products in South Africa. Demand for maize on a national level is approximately 4.2 million tons. In O.R. Tambo District Municipality the demand for maize is approximately 112 103 tons. A complete breakdown can be seen in Table 9.2.

Table 9.2 - Annual Demand for Maize (tons)

Area of Demand	Estimated Demand
South Africa	4 251 916
Eastern Cape	538 941
O R Tambo District	112 103
Ngquza Hill	22 872
Port St Johns	12 823
Nyandeni	23 850
Mhlontlo	15 459
King Sabata Dalindyebo	37 099

Source: Quantec 2013, Census 2011

9.7 Socio-Economic Factors

The Agri-Park vision, as discussed in Chapter 2, outlines the importance of socio-economic development as an objective of the Business Plan. Socio-economic progress and development can be measured in various ways, however the primary method of measurement selected for maize commodity is job creation. Job creation is measured via the use of commodity labour multipliers, measuring the number of jobs created per R1 million produced in the commodity production process. The three relevant multipliers for the O.R. Tambo District Municipality Maize Market are the:

- Direct Multiplier
- Indirect Multiplier
- Induced Multiplier (See Chapter 7)

The direct employment multiplier is 3.49 jobs created per million produced. The indirect multiplier is at 1.34 jobs. The induced multiplier is 1.91 jobs (OABS Development, 2015). The total multiplier is 6.74 jobs created per R1 million produced.

The three multipliers measure the total numbers of job created in an ideal economic environment for the maize commodity. The small-scale farmers and rural communities within the district are familiar with maize production, from both a current subsistence and historical production context. Small-scale production is notorious for utilising more labour per unit produced than large-scale commercial production endeavours. Small-scale production requires a small to medium investments in infrastructure and farming implements, while large-scale operations would require significant investments for planting, harvesting, storage and potentially processing, increasing the direct labour multiplier above that of the identified 3.49 jobs. Maize processing is likely to occur within the Agri-Hub at the Lambasi processing facilities, leading to the expected increase in indirect job creation. Induced multiplier job creation within the district can be as expected.

Information that is available on the District's maize production and the potential number of hectares, together with the Bureau for Food and Agriculture Policy, have been used to estimate the employment opportunities that maize production can contribute in the 10-year period. The Agri-Park can provide approximately 730 employment opportunities from the programme. It must be noted however that these figures are purely indicative and will change through the development of the Agri-Park.

9.8 Contribution to Food Security

The government's Integrated Food Security Production Intervention Programme was introduced in 2012 to afford smallholder farmers, communities and households the ability to increase production of basic food. This intervention will be managed over a period of 10 years from 2012 to 2022. The programme is intended to promote self-sufficiency and food security by getting communities to plant their own food. Additionally, in October 2013, the government launched the food security programme, Fetsa Tlala with funds of R2 billion. The programme is managed by DAFF.

Maize, wheat and rice are some of the most important staple foods in developing countries. According to CIMMYT (2011), between 2011 and 2050, the demand for maize will more than double. By 2025 maize will have become the crop with the greatest production globally and in the developing world. It was estimated that current levels of maize productivity growth will still fall short of demand and millions of farm families will remain in poverty. The report therefore provides a strategy that should improve food security and the livelihoods of the resource-poor (CIMMYT & IITA, 2011).

Rice, wheat and maize have been identified as global food security crops. While it is recognised that the world does not only consume rice, wheat and maize, challenges facing these crops should be addressed to avoid major negative implications for the poor. Climate change challenges has resulted in lower expected growth in maize production over the next few decades (IFPRI, 2010). Climate change challenges have been felt in 2015, with large parts of South Africa experiencing droughts, resulting in a considerable drop in production and an increase in prices. For food prices to remain relatively constant, annual yield gains must increase. It was estimated that maize yields should be increased internationally from 1.6% to 2.4%, using the same level of resources/inputs (IFPRI et al, 2010).

9.9 Regulatory Requirements

Local markets are governed by a series of policies in place for various reasons. Table 9.5 indicates the relevant policies that affect local market with regards to citrus. The most important of these Acts is the Agricultural Product Standards Act, 1990 which sets out to establish a set of norms and standards related to the sale, labelling, storage and packaging of maize throughout South Africa. This indicates that all maize and maize products sold in South Africa have to comply with the regulations set out in the norms.

Various other acts and policies are also apply to the industry which are included in Table 9.3 below.

Table 9.3 - Polices Affecting the Maize Industry

Regulation	Description
Agricultural Product Standards Act, 1990 (ACT No. 119 OF 1990)	• Regulations relating to the grading, packing and marking of maize products intended for sale in the Republic of South Africa. • Maize quality is determined by official grading regulations promulgated under the Agricultural Products Standards Act, which governs the classification and grading of maize based on several qualitative factors. The quality of the maize destined for export is confirmed with an export certificate issued by the Perishable Products Export Control Board (PPECB) as the official assignee of DAFF.

Regulation	Description
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947)	• The act provides for the appointment of a Registrar of Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies; • for the registration of fertilizers, farm feeds, agricultural remedies, stock remedies, sterilizing plants and pest control operators; • to regulate or prohibit the importation, sale, acquisition, disposal or use of fertilizers, farm feeds, agricultural remedies and stock remedies; • To provide for the designation of technical advisers and analysts.
National Water Act, 1998 (Act No.36 of 1998)	• This act encompasses laws relating to water resources and the use thereof.
Conservation of Agricultural Resources Act No. 43 OF 1983	• Control over utilization of natural agricultural resources • Promote conservation of soil • Promote conservation of water sources • Promote conservation of vegetation • Combating of weeds and invader plants
Genetically Modified Organisms Act	• Promote the responsible development, production, use and application of genetically modified organisms. • To limit possible harmful consequences to the environment. • To give attention to the prevention of accidents and the effective management of waste. • To limit, evaluate and reduce potential risks. • To establish a council for GMO's • To ensure GMO's do not present a hazard to the environment. • To establish appropriate procedures for the notification of specific activities involving the use of GMO's.
Marketing of Agricultural Products Act	• To establish and enforce regulatory measures to intervene in the marketing of agricultural products, including the introduction of levies. • To establish a National Agricultural Marketing Council
Plant Breeders Rights Act	• Plant breeder's rights are granted for certain kinds of plants. • Establish rights to be complied with to grant the rights. • For the protection of rights and exercise thereof.
Plant Improvement Act	• To provide for the registration of premises from which the sale of certain plants or the cleansing, packing and sale of certain propagating material may be undertaken. • To prescribe the conditions for such plants, or propagation material to be sold. • To provide recognition for such plants. • To provide for a system of certification with the objective of maintaining quality. • Control of imports and exports
Agricultural Pests Act	• To provide for measures by which agricultural pests may be prevented and combated.
Foodstuffs, Cosmetics and Disinfectants Act (Act No. 54) of 1972	• To control the sale, manufacture and importation of foodstuffs, cosmetics and disinfectants.
Occupational Health and Safety Act, 1993 (Act No.85 of 1993)	• Aims to provide for the health and safety of persons at work and the health and safety of persons in connection with the activities of persons at work and • To establish an advisory council for occupational health and safety.

Regulation	Description
Basic Conditions of Employment Act, 1983 (Act No. 3 of 1983)	• Encompasses those regulations associated with fair labour practices.
Marketing Act, 1968 (Act No. 59 of 1968)	• The Act has authorised an establishment and enforcement of regulatory measures to intervene in the marketing of agricultural products, including the introduction of levies on agricultural products.

Source: Government Gazette (1947; 1968; 1972; 1983; 1983; 1990; 1993; 1998; 2008; 2014)

9.10 Substitute Products and Services

Maize and maize products do not have many substitutes. Maize serves as a stable food within the district, with the agricultural community revolving around subsistence production of the commodity. Maize production and processing often serve as substitutes to products further down the maize value chain.

9.11 Maize Barriers to Entry

Barriers to entry are obstacles that make entry into a given market difficult such as regulations, high infrastructure costs or competition in the given area. This section will discuss the barriers to entry of the maize industry, as shown in Table 9.4.

Table 9.4 - Barriers to Entry: Maize

CONSTRAINT	DESCRIPTION	LEVEL OF INFLUENCE
CAPITAL, RAW MATERIALS AND PRODUCTION ISSUES		
Climatic conditions	The prevailing climatic conditions determine where maize can be grown effectively, limiting production to only certain areas in the district.	-
Farmland availability	The identification of sufficient vacant land within the district on which to begin/expand maize production is a challenge for the industry. In the homeland areas, various land uses create a challenge. Related to this are the land tenure issues that will need to be addressed if land in these areas is to be released for commercial production.	Provincial
High production costs	A large proportion of production inputs are imported, resulting in relatively high input and capital costs. There are also significant costs associated with transporting maize to major markets.	-
HUMAN RESOURCE ISSUES		
Lack of skills	Skill levels in the former homeland areas of the O.R. Tambo District Municipality are relatively poor and there is a need for appropriate skills transfer programmes to improve production practices and subsequently, yields.	Provincial, District
INFRASTRUCTURE		

CONSTRAINT	DESCRIPTION	LEVEL OF INFLUENCE
Silos	Since maize production is a once a year activity, harvested maize has to be stored in silos until utilised. This adds to the cost of the price of grain for the consumer, millers and the industry. There is also currently insufficient maize storage capacity in the O.R. Tambo District Municipality.	Provincial, District
COMPETITION AND ACCESS TO MARKETS		
Industry price setting	The price of maize in South Africa is controlled by the import and export parity prices. The revenue received by individual farmers can therefore vary significantly, making it difficult for famers to properly manage their cash flow.	-

Source: Urban Econ, 2015

9.12Societal and Cultural Trends

Maize has an important cultural significance within the rural areas of the former Transkei, with many households producing at subsistence levels as a dietary staple or to supplement the household diet. Maize has historically been produced at subsistence levels within the region, utilised primarily by migrant farmers (Richards, 2003). Socially, maize still provides important usages, substituting large parts of the rural household's diet with production produced locally, with multiple uses, such as food for the household and the livestock, corn-bread, maize meal, etc.

9.13SWOT Analysis

The following section discusses the Strengths, Weaknesses, Opportunity and Threats of the maize commodity value chain in the O.R. Tambo District Municipality with relation to the Agri-Park. Strengths and weaknesses refer to the positive and negative internal factors affecting the growth of the industry; whereas threats and opportunities refer to the external factors affecting the industry.

9.13.1 Strengths

- **Biophysical Criteria:**
  - There are numerous areas within the O.R. Tambo District Municipality strongly suited to the production of maize.

- **Enterprise Viability Criteria:**
  - Demand for maize and maize products is relatively strong across the Eastern Cape, especially within the O.R. Tambo District Municipality.
  - The markets for maize are relatively open and able to accommodate most production from a variety of sources including small and emerging farmers.
  - Maize farms can begin production relatively soon after establishment
  - The local communities are familiar with maize production, because of historical and cultural production trends.
  - Processing opportunities exist within the district at the RED Hubs at Lambasi and Mqanduli.

- **Economic Development Criteria:**

- Maize farming contributes significantly to down-stream economic opportunities and job-creation.

- **Political & Social Criteria:**
  - The District and other public sector role-players are already very active in supporting maize farming projects.
  - Maize farming contributes significantly to food security both directly and by supporting the livestock value chain through the supply of feed.
  - Maize farming concerns are very sustainable in the long run if the land is managed correctly.

9.13.2 Weaknesses

- **Biophysical Criteria:**
  - The prevailing climatic conditions determine where maize can be grown. This limits production to certain parts of the district

.

- **Enterprise Viability Criteria:**
  - Maize production does not generate large profits under small-scale production. -scale.
  - Business strategy guiding maize production is weak.
  - The majority of maize production in the district is at a subsistence level.

- **Economic Development Criteria:**
  - Maize farming does not contribute greatly to direct on-farm job creation.
  - Maize farming jobs are relatively low-skilled and offer few opportunities for advancement.
  - No large-scale commercialisation of maize occurs within the district.
  - There is a lack of storage facilities for local production within the district.

9.13.3 Opportunities

- **Enterprise Viability Criteria:**
  - Supply of maize inputs, particularly seeds
  - Milling for maize meal as well as animal feed production
  - Wet milling
  - Development of silos and other storage facilities
  - Brewing of maize (beer, etc.)
  - Yellow maize is used for both local consumption and in supplying feed for animals within the district.

- **Economic Development Criteria:**
  - Maize farming has numerous agro-processing opportunities that can be exploited at a District Agri-Park level.
  - There are large opportunities to supply the local O.R. Tambo District Municipality consumer market.
  - Small-scale local processing opportunities exist at a regional level
  - There is good scope for agglomeration of production, with multiple small-scale farmers working to produce on the same land.
  - The maize market is robust and any maize production will find a buyer. High quality maize will fetch a premium price but even low quality production can be sold to offset costs in the feed

markets. Processing opportunities exist within the district at the RED Hubs at Lambasi and Mqanduli.

- **Political & Social Criteria:**
  - Maize is relatively accessible and easy to grow crop for small and emerging farmers.

9.13.4 Threats

- **Enterprise Viability Criteria:**
  - The O.R. Tambo District Municipality is a former homeland area. As a result, much of this land is held under communal land ownership. Releasing good quality land for commercial development is therefore likely to be difficult.

- **Economic Development Criteria:**
  - Theft and vandalism poses a moderate threat to maize production
  - Poor fence maintenance or vandalism allows for livestock to access the field and eat the crop.

- **Political & social Criteria:**
  - Delays or complications in securing land to farm threatens to derail any planned vegetable farming projects.

Vegetables & Fruit

Chapter 10

10. VEGETABLES AND FRUIT

The following commodity assessment builds upon the vegetables commodity identified within the previous chapter. As per the outcomes of the commodity prioritisation matrix, fruit was included with vegetables for development. Both these commodities feed into the horticultural market value chain.

Vegetables and fruit[2] are produced in most parts of the country. However, in certain areas farmers tend to concentrate on specific crops; for example, green beans are grown mainly in Kaapmuiden, Marble Hall and Tzaneen, green peas mainly in George and Vaalharts, onions mainly in Caledon, Pretoria and Brits, and asparagus mainly in Krugersdorp and Ficksburg regions. Similarly, Citrus is mainly grown in Kirkwood and Mpumalanga, grapes in Cape Town and Stellenbosch, and bananas in KwaZulu-Natal.

10.1 Production

The production of vegetables and fruit in South Africa for the period 2009/10 to 2013/14 compares as summarised in Table **11.**1 and 11.2:

Table 11.1 - Production Volumes of Vegetable Types

Year July to June	2009/10	2010/11	2011/12	2012/13	2013/14
	'000 tons				
Potatoes	1 955	2 165	2 205	2 202	2 193
Tomatoes	575	523	545	527	525
Pumpkins	234	237	244	247	245
Green mealies1	339	340	347	361	362
Onions	489	563	625	596	592
Sweet potatoes	60	63	55	57	69
Green peas	17	12	8	11	12
Beetroot	67	62	66	68	61
Cauliflower	25	16	16	14	12
Cabbage and red cabbage	141	153	141	136	145
Carrots	151	152	178	183	184
Green beans	23	25	25	24	19
Other	400	406	421	420	416
Total	**4 476**	**4 717**	**4 876**	**4 846**	**4 835**

Source: DAFF (2015A)

[2] The term "Fruit" refers to avocados, bananas, mangoes and peaches, as these were the commodities most suitable for production in O.R. Tambo District Municipality. The Abstract of Agricultural Statistics deals with numerous categories of fruit, which was determined to dilute the relevant production statistics.

Table 11.2 - Production Volumes of Selected Fruit Types

Year October to September	2009/10	2010/11	2011/12	2012/13	2013/14
	'000 tons				
Peaches	167	171	191	183	155
Avocados	64	81	88	87	97
Bananas	382	402	371	392	463
Mangoes	55	52	65	50	54
Total	**669**	**708**	**715**	**713**	**770**

Source: DAFF (2015A)

From 2012/13 to 2013/14, the total production of vegetables decreased by 0.22%, from approximately 4 846 000 tons to 4 835 000 tons. Concerning the major vegetable types in terms of volumes produced, the production of green mealies rose slightly from approximately 361 000 tons to 362 000 tons and sweet potato's increased by approximately 12 000 tons or 21.2%. Most of the vegetable crops, however, decreased over the period.

The total production of fruit increased by 7.99% over the same period, increasing from 713 000 to 770 000. The production experienced increases across all commodities except peaches, which decreased production by 28 000 tons.

10.1.1 Importance of major vegetable & fruit types:

The relative importance of the major vegetable types, according to gross value of production, during the 2013/14 season, is depicted in Table 11.3.

Table 11.3 - Relative Importance of Vegetable Types

Rank	Product	% Share
1	Potatoes	42%
2	Tomatoes	16%
3	Cabbages	13%
4	Onions	4%
5	Pumpkins	3%
6	Carrots	3%
7	Gem squashes	2%
8	Sweet potatoes	1%
9	Cauliflower	1%
10	Green beans	1%

Source: DAFF (2015A)

Table 11.3 indicates that potatoes are clearly a vegetable of high relative importance, with an approximate gross value of production equal to 42% of the total for vegetables. Tomatoes and onions are the also important vegetable crops with a combined gross value of 29%.

The relative importance of the major vegetable types, according to gross value of production, during the 2013/14 season, is depicted in Table 11.4.

Table 11.4 - Relative Importance of Vegetable Types (excluding Potatoes)

Rank	Product	% Share
1	Tomatoes	28%
2	Cabbages	23%
3	Onions	7%
4	Pumpkins	5%
5	Carrots	5%
6	Gem squashes	3%
7	Sweet potatoes	2%
8	Cauliflower	2%
9	Green beans	2%
10	Hubbard squashes	2%

Source: DAFF (2015A)

Table 11.4 indicates that tomatoes and onions are clearly a vegetable of high relative importance, with an approximate gross value of production equal to 51% of the total for vegetables when potatoes are excluded. Squashes, such as butternut and pumpkins, and also cabbages are also important crops with over 10% of the production.

Table 11.5 shows that bananas are a significant part of the national total fruit production, contributing 6.8%. Other commodities for consideration for production in O.R. Tambo District are smaller contributors.

Table 11.5 - -Relative Importance of Fruit Types to Total Market Production

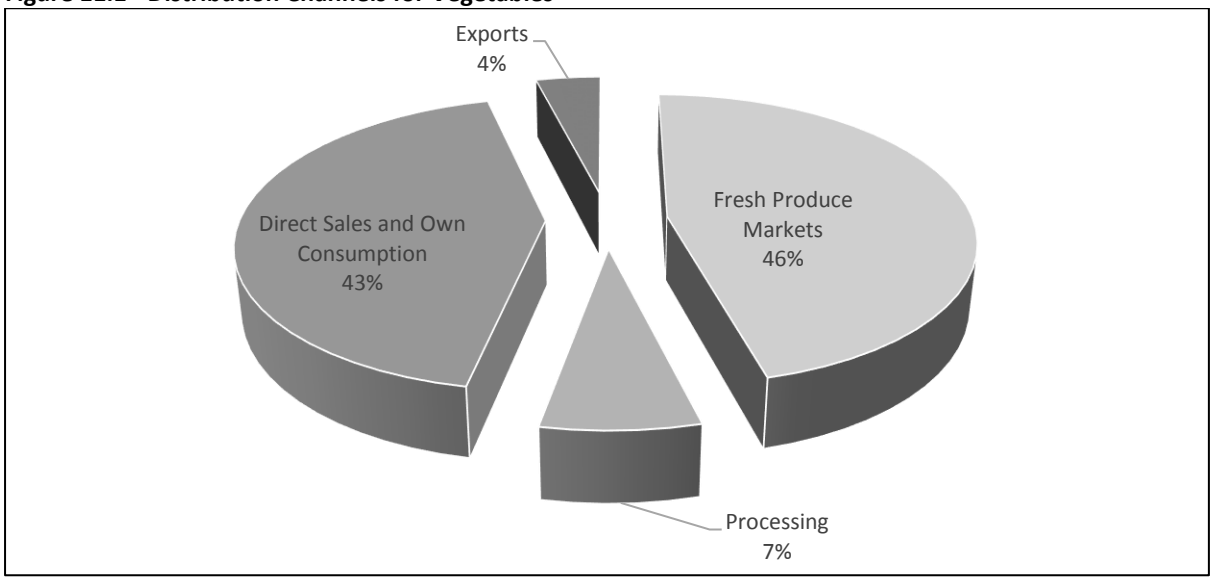
Rank	Product	% Share
1	Bananas	6.8%
2	Peaches	2.3%
3	Avocados	1.4%
4	Mangoes	0.8%

Source: DAFF (2015A)

10.1.2 Distribution channels

Figure 11.1 indicates the volume of vegetables that are traded through various distribution channels that are available to farmers.

Figure 11.1 - Distribution Channels for Vegetables



Source: DAFF (2015A)

It is clear from Figure 11.1 that approximately 46% of the volume of vegetables produced is traded on the major fresh produce markets. The total volume of vegetables sold on these markets during 2014 amounted to 2 293.6 thousand tons, compared to the 2 107.8 thousand tons that sold during 2010, an increase of approximately 9%. The total volume of fruit sold on these markets during the 2013/14 season was 340 761 tons, an increase of 12%. Sales statistics for other years can be seen in Table 11.6.

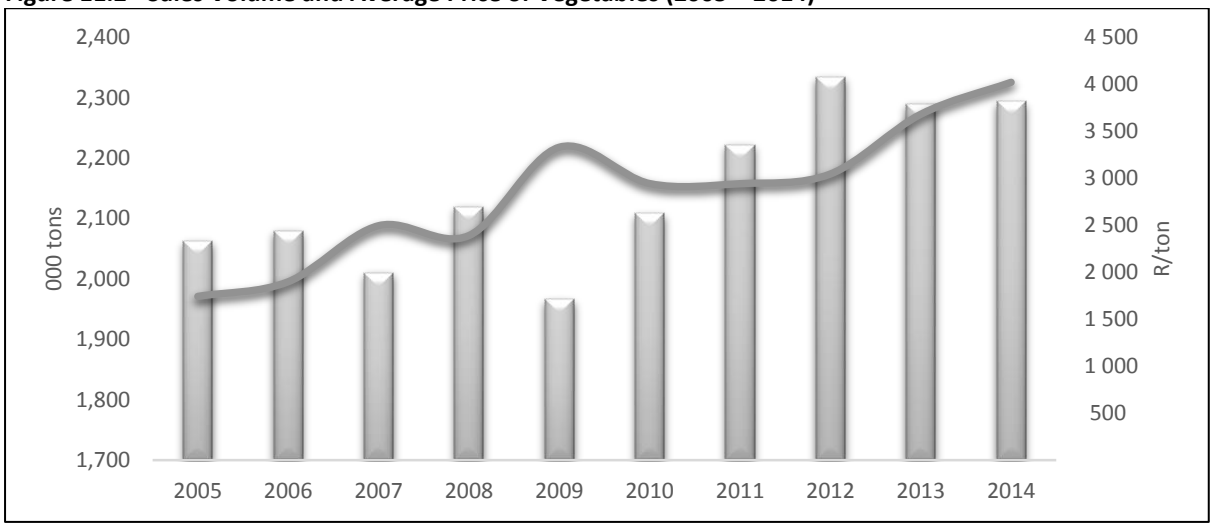
Table 11.6 - Quantity of Important Vegetables and Fruit Sold on the Major Fresh Produce Markets ('000 tons)

Year	2010	2011	2012	2013	2014
Vegetables	2 107.8	2 222.1	2 334.4	2 290.2	2 293.6
Year	**2009/10**	**2010/11**	**2011/12**	**2012/13**	**2013/14**
Fruit	289.2	303.5	285.7	305.0	340.8

Source: DAFF (2015A)

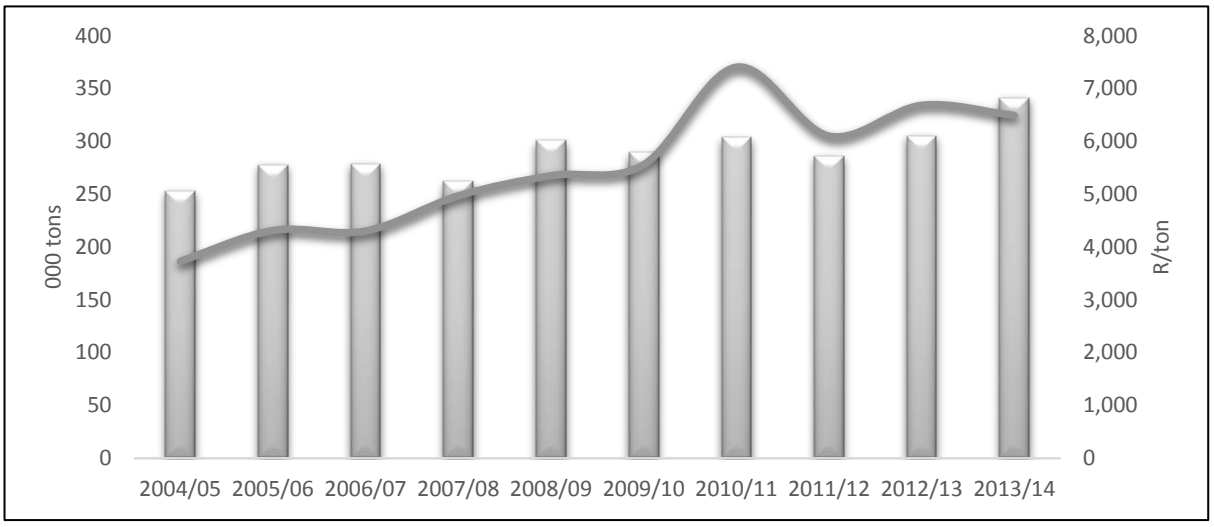
The values of sales of vegetables and fruit on the major South African fresh produce markets for the period 2008/09 to 2012/13 are included in Figures 11.2 and 11.3.

Figure 11.2 - Sales Volume and Average Price of Vegetables (2005 – 2014)



Source: DAFF (2015A)

Figure 11.3 - Sales Volume and Average Price of Fruit (2005/06 – 2013/14)



Source: DAFF (2015A)

10.2 Prices

The average prices of vegetables realised on the fresh produce markets for the period 2008/09 to 2012/13 are included in Table 11.7, and the prices of fruit are included in Table 11.8 over the 2010/11 to 2013/14 season.

Table 11.7 - Average Price of Vegetable Types

Product	2011	2012	2013	2014	Average Price Increase (%)
	R/ton				
Potatoes	2 591	2 645	3 379	3 428	10%
Tomatoes	4 339	4 407	4 847	6 082	12%
Cabbages	1 516	1 772	2 109	2 180	13%
Onions	2 221	2 587	3 433	3 334	15%
Pumpkins	1 675	1 617	2 156	2 128	10%
Carrots	2 815	2 633	3 154	3 644	10%
Gem squashes	2 615	2 702	2 666	3 248	8%
Sweet potatoes	2 995	3 636	2 798	3 724	10%
Cauliflower	4 145	4 960	5 066	8 380	29%
Green beans	6 572	6 815	7 263	8 454	9%
Hubbard squashes	1 880	1 844	1 954	2 283	7%
Beetroot	2 821	2 365	3 858	4 335	20%
Cucumbers	5 862	7 337	7 320	8 487	14%
Lettuce	4 263	4 828	4 573	5 508	9%
Green peas	21 035	27 516	23 923	37 621	25%
Green mealies	9 471	11 409	8 344	13 089	17%
Marrows	8 575	7 648	9 085	10 718	9%
Turnips	3 651	2 728	3 527	4 052	6%
Butternut squashes	2 420	2 408	2 871	3 227	10%
All vegetables	**2 944**	**3 047**	**3 683**	**4 024**	**11%**

Source: DAFF (2015A)

Table 11.8 - Average Price of Fruit Types

Product	2010/11	2011/12	2012/13	2013/14	Average Price Increase (%)
	R/ton				
Peaches	7 873	8 166	9 444	11 054	14%
Avocados	6 311	7 373	6 733	7 155	5%
Bananas	3 810	4 321	4 408	4 278	4%
Mangoes	6 411	6 875	5 378	7 136	4%
Total	**6 101**	**6 684**	**6491**	**7 405**	**7%**

Source: DAFF (2015A)

Table 11.7 indicates that, on average, prices of vegetables have increased by 11% annually between 2011 and 2014. Of the vegetables in Table 11.7, cauliflower, beetroot, and green peas increased the most over the period, with increases of 29%, 20% and 25% respectively.

Table 11.8 indicates that, on average, prices of fruit have increased by 7% annually between 2010/11 and 2013/14. Of the fruit in Table 11.8, peaches increased the most over the period, bringing up the average price increase substantially.

10.3 Households participating in vegetable & fruit production

According to the agricultural census survey conducted in 2011, a total of 1 123 520 households are involved on the production of vegetables, and 659 737 households are involved in other crop production (including fruit). The summary of findings are summarised in Table 11.9.

Table 11.9 - Number of Agricultural Households in a Specific Activity by Province

Province	Livestock Production	Poultry Production	Vegetable Production	Production of other crops	Fodder/ grazing production	Other
Western Cape	28,334	29,176	39,337	22,725	16,516	23,804
Eastern Cape	**330,354**	**334,665**	**246,412**	**99,052**	**24,335**	**33,493**
Northern Cape	28,040	25,853	9,334	11,324	4,518	5,415
Free State	45,207	51,414	106,809	63,193	11,106	13,811
KwaZulu-Natal	268,656	356,881	340,743	109,580	27,393	45,715
North West	88,633	117,453	36,620	42,923	16,013	25,301
Gauteng	62,047	82,403	147,870	89,167	50,650	78,847
Mpumalanga	72,896	127,759	91,214	59,885	11,439	20,595
Limpopo	172,683	173,681	105,181	161,888	13,995	31,067
South Africa	**1,096,850**	**1,299,285**	**1,123,520**	**659,737**	**175,965**	**278,048**

Source: DAFF (2015A)

Table 11.9 presents that KwaZulu-Natal has the largest number (25.3%) of households involved in vegetable and other crop production, followed by Eastern Cape (19.4%) and Limpopo (15.0%). Eastern Cape has 246 412 households that are involved in vegetable production, and 99 052 households involved in other crop production (including fruit).

10.4 Consumption

The importance of vegetables in a healthy diet is being strongly promoted by all the stakeholders in the fresh produce marketing chain. The per capita consumption of fresh vegetables was 43.01kg during 2014, approximately 2.8% lower than the previous year. Table 11.10 summarises consumption of vegetables (excluding potatoes) and fruit between 2010 and 2014.

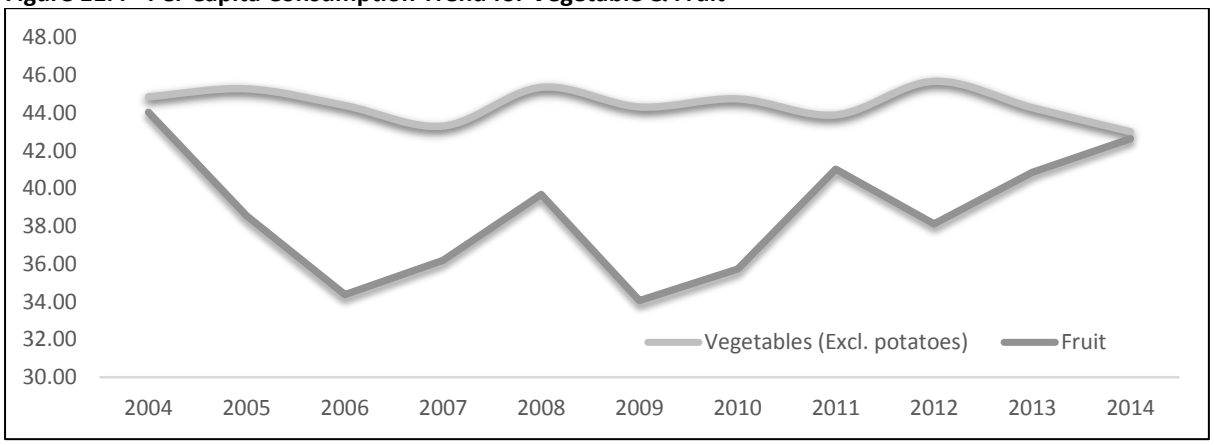
Table 11.10 - Per Capita Consumption of Vegetables & Fruit

Year	2010	2011	2012	2013	2014
Vegetables (potatoes excluded) (Kg/Year)	44.75	43.90	45.68	44.28	43.01
Fruits[3] (kg/year)	35,73	41,03	38,13	40,86	42,64

Source: DAFF (2015A)

Per capita consumption of vegetables has remained relatively stable over the last 10 years, ranging between 43.01kg per year to 45.68kg per year. Figure 11.4 illustrates the fluctuations in per capita consumption of vegetables and fruit between 2004 and 2014.

Figure 11.4 - Per Capita Consumption Trend for Vegetable & Fruit



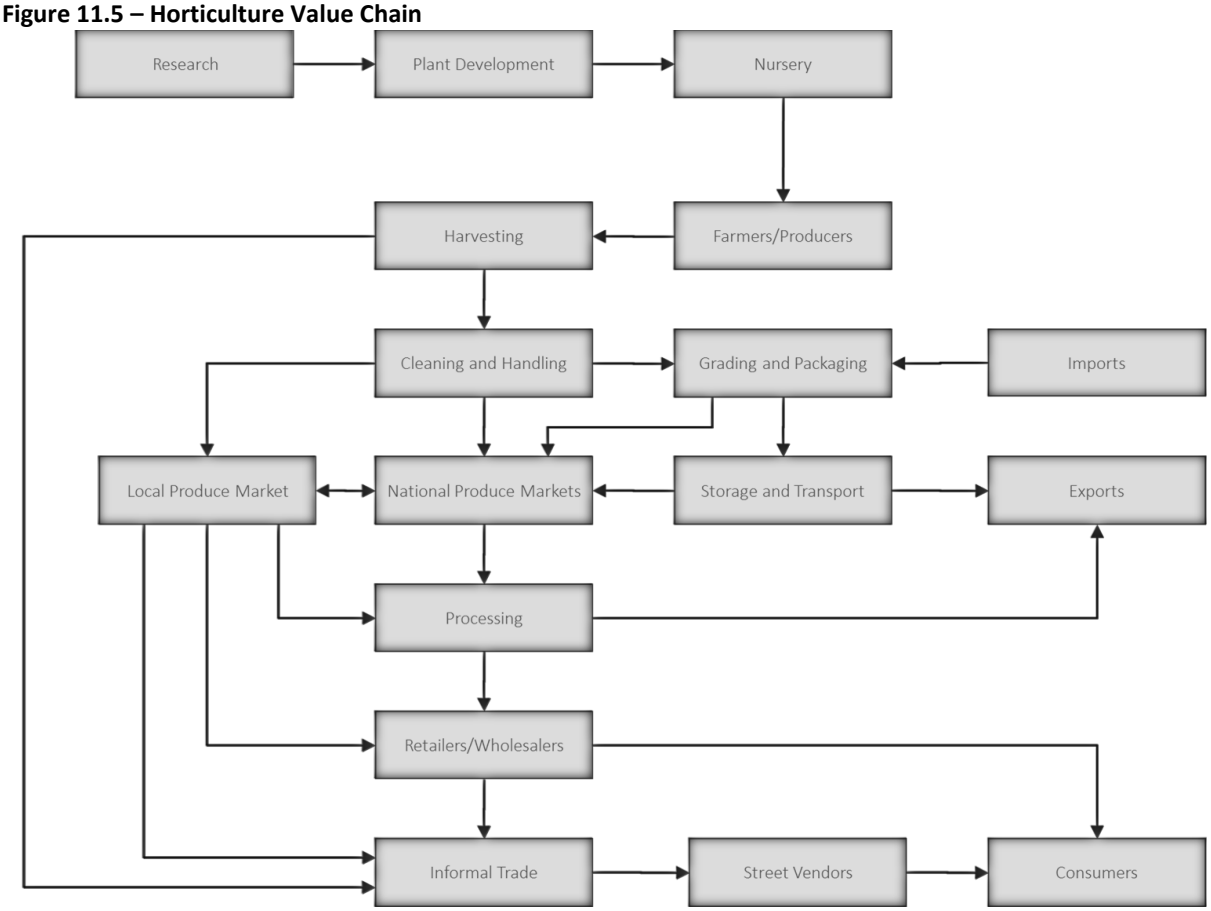
Source: DAFF (2015A)

Consumption patterns with respect to vegetable have remained predominantly stable at just over 40kg per capita within South Africa. Fluctuations in per capita consumption figures may vary due to population figures as well as production figures for the year in question.

[3] Deciduous & sub-tropical and citrus Fruit consumption per capita

10.5 Value Chain Analysis

Figure 11.5 – Horticulture Value Chain



Source: Urban-Econ (2015)

10.5.1 Upstream activities

As vegetable production is classified as primary production the upstream activities relevant to the value chain are primarily the input supplies used in the production system. The major inputs for vegetable production include seedlings, fertilising, weed, pest and disease control, irrigation equipment, machinery equipment as well as knowledge. Most of these inputs are supplied by Agricultural Co-operatives in the respective areas. The Eastern Cape Province has three major Agricultural Co-operatives namely:

- OVK – TRADE
- Humansdorp Ko-op
- East Cape Agri – Co-op Ltd / BKB LTD

10.5.2 Primary production activities

The horticultural industry of South Africa accounts for nearly one-third of total gross farm income in the country. There are 17 major fresh produce markets throughout South Africa, the largest being the Johannesburg Fresh Produce Market (JFPM) which comprises a 34% market share with a total turnover of nearly 900,000 tons valued at over R2.0 billion in 2006 (NAMC Section 7 Report, 2006). In 2007, tomato volumes sold at the JFPM were 107 000 tonnes (JFPM Statistics, 2008) at a value of over R300 million. Potatoes, onions, and cabbages are the other major vegetables sold nationwide. Between 2005 and 2006, gross income from horticultural products increased by 1.3%, from R20 388million to R20 648 million. The income from deciduous fruit and citrus fruit had a decline

of 7.0% and 14.3%, respectively. On the contrary, income from subtropical fruit and viticulture increased by 3.9% and 2.0 % to R1 496 and R2 733 million, respectively. Income from vegetable production rose by 13.9% to R7 229 million. In general, the South African horticultural industry is growing in both quantities produced and prices received.

Eastern Cape Province has six district municipalities. Using the gross farm income for vegetable production as a ranking yardstick, the most important district municipalities in Eastern Cape are Amathole, Sarah Baartman, Joe Gqabi and Chris Hani District Municipalities, generating R6.5 million, R4.8 million, R3.5 million and R1.3 million respectively to the gross farm income of the province. In this province, the gross farm income from vegetables runs into millions in all district municipalities except for Alfred Nzo and O.R. Tambo.

Fruit production in district municipalities which generate gross farm income into millions, but in a decreasing order are Amathole, Sarah Baartman District Municipality and Nelson Mandela Metro, with a gross farm income of R27 million, R22 million and R16 million, respectively mainly coming from citrus in all the districts.

10.5.3 Downstream activities

Harvesting, handling, washing, trimming, grading, packing, packaging, labelling and transporting are all important practices aimed at preserving the quality of the produce, and presenting it to the best advantage. Prices achieved, and thus differences in income obtained, can be greatly affected by the emphasis placed on these practices. They must, therefore, be considered as important elements in the marketing strategy.

Most commercial producers consider only one or two of the major national markets as marketing outlets, to the exclusion of all other possibilities. The larger producers will supply even some of the far-distant national markets, provided better prices prevail there. Nationally linked information networks can supply daily prices to producers. These national markets, in all the big centres, must remain the major outlets for many of the large vegetable growers, because of the scale of their operations, but even these growers should investigate other possibilities. Smaller producers may possibly be able to dispose of the bulk of their produce more profitably through outlets other than the national markets. Outlets to consider are:

- Direct sales to hawkers or consumers on the farm. Savings may be made on packaging, agents' fees, market commission and transport and so on.
- Farm stalls. Savings as above, but require suitable reliable staff.
- Direct sales to wholesalers, retailers, consumer groups or individual consumers. Delivery costs may be disproportionately high for small consignments.
- Small municipal markets or farmers' markets. Usually not very different to the national markets, more easily glutted, and lower throughput.
- Export markets.

Critical points are the generally high quality specifications, chemical residue tolerances, possible pre-chilling or cooling requirements, specific packaging requirements, high transport costs (particularly air transport), the prevailing demand for the product and expected prices, specific market needs, sales agents, and so on.

Processing companies cannot compete with the premium prices paid for out-of-season produce, but are usually highly competitive with prices in peak season. However, some processing, or value-added practices, such as pre-packing of certain crops, could be done on the farm. Special markets might need to be developed for such products

Significant Points of Sale for Vegetable and Fruits produced are listed below:

- Fresh Produce Markets
- Prisons and school feeding schemes
- Retailers
- Significant informal trade

Significant Marketing Considerations of Vegetables and Fruits produced are:

- Size of outlet, and cost of servicing it.
- Transport availability and cost. Distances, which affects cost, as well as deterioration of the product. Condition of the roads.
- Packaging required, e.g. pre-packs, cartons, boxes, pockets and their relative costs in relation to prices attained.
- Market or consumer preferences.
- Product quality or specifications.
- Contact person or agents.
- Seasonal price trends.
- Market commission and agents' fees.
- Possible delays in payment for consignments.
- Various other possible requirements for the specified outlet.

Approximately 46% of the volume of vegetables in South Africa is traded on the major fresh produce markets and 43% are direct sales and for own consumption. Roughly 7% are destined for processing.

The Global Fruit and Vegetables Processing industry includes all businesses that alter fresh fruit or vegetables to create a higher, valued-added food product for human consumption.

Even though fresh vegetables pose stiff competition for frozen vegetables the latter experiences major growth due to the increase of the global urban population, which has less access to fresh fruits and vegetables than rural populations.

The development of sustainable supply and value chains in the vegetable sector from production through processing to markets, where there are unequal power relationships between large retailers/wholesalers and agro processors, and primary vegetable producers is a constraint. Producers are vulnerable to demand volatility and price fluctuations and are "price takers" because of the buyers' market power. The major vegetable processing players in South Africa are:

- Fresh
- Canning and Pickling
    - Rhodes
    - Langeberg Food Processors Ltd
    - Giants Canning - Everyday
    - Koo
    - All Gold
    - SA Fruit & Vegetable Canners' Association (SAFVCA),
- Frozen
    - McCain Foods SA
    - Just Veggies
    - Nature's Choice Products
    - Lamberts Bay Foods
    - Tender Harvest

- Findus Foods
- Slice and Dice
  - Retailers own products
- Drying & Dehydration
  - Just Veggies
  - Carbocraft (Pty)Ltd

10.6 Stakeholders

Vegetable associations are largely based off of what commodity is grown by the farmers such as potatoes (Potatoes South Africa) and onions (Onion Producers' Organisation). Industry specific organisations assist farmers growing those crops in providing information on the markets and recent developments in the industry. They provide valuable support networks which farmers can take advantage of in order to solve problems or further expand their business. Other general stakeholders are provided in the table below.

Table 11.11 - Vegetable Stakeholders

Stakeholder	Description
The South African Society of Crop Production	The SASCP is a science-based organisation which provides leadership in crop science to promote training, research and technology transfer involving all crops.
South African Fruit and Vegetable Canners Association	SAFVCA was founded in January 1954 with 20 members representing the 3 main industry sectors with regards to Deciduous Fruit, Pineapple, Vegetables and Tomatoes. The Association is a voluntary grouping of fruit and vegetable canning industry members and its mission is to protect and promote their interests and provide its members with synergistic services of value.
Potatoes South Africa	Potatoes South Africa is an association incorporated under the South African Companies Act No 71 of 2008 whose main objective is to serve, protect and promote the interests of the South African potato industry. In terms of its role in the potato industry, Potatoes South Africa operates as an organisation and its structure represents a network of participating role players and individuals.
Onion Producers' Organisation	OPO is an association whose main objective is to serve, protect and promote the interests of the South African onion industry.
Consumer Goods Council of South Africa	The Consumer Goods Council of South Africa (CGCSA) is a member organisation that acts as the representative body of the entire consumer goods industry. Established in 2002, the CGCSA has more than 12 000 member companies across the consumer goods value chain – including the retail, wholesale and manufacturing sectors.

10.7 Technology

Technology is an important aspect to consider in the Agri-Park. Despite the increasing mechanisation of agriculture and decrease in reliance on manual labour, it is important to strike a balance of mechanisation and job creation which improves skills and creates meaningful jobs.

It will vitally important to acquire the correct equipment needed to create a successful Agri-Park. To produce horticulture various equipment will be needed such as tractors, trailers, ploughs, planters (seeds), irrigation, fencing, basic farming implements (spades, hoes etc.) and trucks or LDVs for transporting goods.

Recent developments in farming will have to be considered in order for any farming activity to be competitive in the future. Three such changes have occurred in the vegetable industry; hydroponic tunnels, vertical farming and multi-layered farming. For fruit farming, technology is fairly complex and vast. Depending on the size of the operation, various forms of mechanised technology will need to be used. In South Africa a large workforce is used to plant, take care of and harvest the plants but in other fruit producing areas such as the USA, production of fruit production is mechanised particularly the harvesting cycle of production. The technology most relevant to production in O.R. Tambo District Municipality is nutrient spray and tree management techniques. General advancements in ICT and Logistics are also important.

10.7.1 Hydroponic Agriculture

Hydroponic agriculture is a system where plants are grown in growth media other than natural soil. All the nutrients are dissolved in the irrigation water and are supplied at a regular basis to plants. In a South African context hydroponic systems are always grown under protection (ARC, 2015). The advantages of such a system are numerous namely;

- Hydroponically produced vegetables can be of high quality and need little washing.
- Soil preparation and weeding is reduced or eliminated.
- It is possible to produce very high yields of vegetables on a small area because an environment optimal for plant growth is created. All the nutrients and water that the plants need, are available at all times.
- Soil quality is of limited importance.
- Water is used efficiently.
- Pollution of soil with unused nutrients is greatly reduced (ARC, 2015)

Some of the disadvantages however, include;

- Hydroponic production is management, capital and labour intensive.
- A high level of expertise is required.
- Daily attention is necessary.
- Specially formulated, soluble nutrients must always be used.
- Pests and diseases remain a big risk.
- Finding a market can be a problem (ARC, 2015).

10.7.2 Vertical Farming

Similarly to hydroponic agriculture is the idea of vertical farming. Vertical farming is the act of growing plants using hydroponics but stacked vertically on top of each other (AVF, 2015). It utilises LED lights to simulate sunlight and thus can be placed in doors in old buildings and underutilised spaces. Crops can grow 40% faster than in a field and often do not require poisonous substances as pest are kept at bay (AVF, 2015). The exact nutrients and minerals are provided through the irrigation system with little to no use of soil. The overall impact is that more plants can be grown in a limited space with little concern for the outdoor temperature or soil conditions. The pioneers of this industry are the USA, Japan and Singapore. The biggest negatives of this system is that it utilises a large amount of electrical power (AVF, 2015). Additionally, depending on the method used to produce electricity then it could be possible that vertical farming is more dangerous to the environment than field farming.

10.7.3 Multi-layered farming

Although not a novel concept multi-layered farming has emerged as important part of the global livelihoods strategy and a possible way forward for emerging farmers. While commercial farmers have the opportunity to grow extensive amounts of a single crop, emerging farmers may not have the luxury of large tracts of land and need to utilise the land as much as possible while maintaining the soils integrity (Agricultures Network, 2015). Multi-layer farming is using the different layers of soil to grow different crops. Tubers can be grown deep in the bottom layer of soil, carrots or other bulbs in the mid layer and lettuce or cabbage in the top layer of soil. It should be noted that it is important to choose crops that are complimentary and not choose crops and that use the same minerals (Agricultures Network, 2015).

This method of farming was used extensively in the Himalayas and is seen as a solution to not having extensive tracts of land to grow crops. It provides emerging and small farmers with many marketable options and sustainability as well as livelihood resilience. If one crop is undesirable or is not successful then other crops can cover any losses experienced. The biggest pitfalls of this system is that it requires extensive knowledge of the area and of the crops that can be grown together (Agricultures Network, 2015).

10.7.4 Nutrient Spray and Tree Management Techniques

Fruit farming in South Africa has remained fairly constant in terms of equipment and implements, but the largest changes have been in the care-taking strategies involving the production of the tree or plant. Many of these strategies are in line with new export protocols that have been put into place by the EU and other export partners. Many new care-taking strategies have also increased production of citrus and have reduced the number of citrus lost to splitting and to certain diseases and pests (NSW DPI, 2008). This includes spraying with certain nutrient compounds during very specific growth periods. The most common of these sprays include gibberellic acid which improves the fruit immensely and reduces issues such as creasing and splitting (NSW DPI, 2008). Various techniques which promote fruit growth are also used such as girdling. Girdling is the striping a small ring of bark away from the tree to stop it from sending carbohydrates to the roots (Rivas *et al*., 2006). This technique is extremely useful in increasing yield among the final fruit set (Rivas *et al*., 2006). This is a result of delaying the carbohydrates (that is created in the leaves through photosynthesis) from moving to the roots (Rivas *et al*., 2006). This increases the amount of soluble sugars in the fruit and produces better fruit on the tree (Rivas *et al*., 2006). Many of these techniques and nutrient sprays would need to be adopted by emerging farmers in order to be effective.

10.7.5 ICT

ICT is possibly the biggest development in the agricultural sector for emerging and commercial farmers alike. The emergence of the internet and mobile phones has led to an exorbitant amount of data at the fingertips of the farmers. If they require information then it can be obtained immediately and problems solved sooner than before (e-Agriculture, 2015). ICT has allowed the emergence of training software and applications (Apps) which people can use for the benefit of the staff who work for them and for themselves. Training can be done outside of training centres and content directly displayed on smartphones. Smartphones have also allowed for greater access to market prices and market related news as it happens and sooner than what used to occur (e-Agriculture, 2015). This can allow farmers to make adjustments before they impacted negatively. This has also allowed access to online and cell phone banking and various finance facilities (e-Agriculture, 2015). This means that farmers have access to their finances from their phones and do not have to leave the farm to bank. Online banking has also made farming safer as large amounts of cash is no longer used to pay staff and instead can be paid into bank accounts or cell phone numbers. ICT has allowed for the effective design of farms around the land

that is available to farmers and has allowed for farmers to be more efficient and handle finance and information related queries over a long distance instead of being at a physical location in person. This has also allowed for the effective management and understanding changing markets as they occur which allow farmers to react in a timely manner (e-Agriculture, 2015).

10.7.6 Logistics

In order for the Agri-Park to be successful there needs to be and effective and well run logistics system. Logistics is an extremely important part of agriculture as it relies on transport of goods to and from the farm to the processing facilities and to markets. Trucks and other large freight vehicles which transport goods are vitally important in any industry and is also important in the vegetable industry. Goods need to be transported in such a manner that they are not damaged. If goods need preservation then it is important to consider using refrigerated trucks to transport of produce. The second aspect of logistics is the medium of transport itself. Roads or the rail system need to be in good order and should be well connected in order to reduce the loss of produce and damage to trucks which can add on unnecessary costs to the farmers.

10.8 Demand and Needs Analysis

Per capita consumption of vegetables has remained relatively stable over the last 10 years, ranging between 43.01kg per year to 45.68kg per year. Figure 9.11 illustrates the fluctuations in per capita consumption of vegetables between 2004 and 2014.

With respect to the importance of, and opportunities posed by the specific marketing channels, the following market segments are the most promising that should be focused on:

- National Fresh Produce Markets during the initial start-up phase.
- Street hawkers including bakkie traders, however, it is essential to establish a logistical and supply coordination system as discussed.
- Government institutions, as soon as the farmers become reliable suppliers.
- Large retail chains should become a major priority after the farmers have gained experience in production and the Agri-Parks system successfully established quality control and streamlined logistical arrangements
- Packhouses (vegetable packers and wholesalers) and processors in case of farms that are situated near packers or processors that handle cabbages.

It is possible to provide an estimate for demand based on historical consumption figures and populations. The figure below provides a summary of estimated demand on a national and provincial level.

At an average per capita consumption of vegetables at 43kg, there is clear demand for vegetables in South Africa, with national demand for vegetables at approximately 2.2 million tons per year. In O.R. Tambo District Municipality the demand for vegetables is approximately 58 693 tons. More detail can be seen in Table 11.12.

Table 11.12 - Annual demand for vegetables (tons)

Area of Demand	Estimated Demand
South Africa	2 226 134
Eastern Cape	282 168
O R Tambo District	58 693
Ngquza Hill	11 975
Port St Johns	6 714
Nyandeni	12 487

Area of Demand	Estimated Demand
Mhlontlo	8 094
King Sabata Dalindyebo	19 424

Source: Quantec 2013, Census 2011

The figures below show the value of consumption on vegetables annually in South Africa, the Eastern Cape as well as the O.R. Tambo District Municipality and its local municipalities.

Table 11.13 - Annual expenditure on vegetables

Area of Demand	Estimated Demand
South Africa	R 12 994 943 853
Eastern Cape	R 952 018 308
O R Tambo District	R 113 009 367
Ngquza Hill	R 19 141 602
Port St Johns	R 8 592 845
Nyandeni	R 17 147 952
Mhlontlo	R 13 604 923
King Sabata Dalindyebo	R 54 522 046

Source: Quantec 2013

10.9 Competitors

O.R. Tambo District Municipality does not have any significant competitors within the vegetables and fruit markets, with the majority of production occurring within the small-scale producer market. Notable competitions would arise from regional production hubs located in Joe Gqabi and Alfred Nzo for vegetables, and Sarah Baartman and Amathole District Municipalities for fruit. Other major competitors would be found within the Mpumalanga and Limpopo Provinces. The major decision to produce should be based off of competitive and comparative advantage within the district, reducing the influence of these providers on district activities.

10.10 Socio-Economic Factors

The Agri-Park vision, as discussed in Chapter 2, outlines the importance of socio-economic development as an objective of the Business Plan. Socio-economic progress and development can be measured in various ways, however the primary method of measurement selected for horticultural commodity is Job Creation. Job creation is measured via the use of commodity labour multipliers, measuring the number of jobs created per R1 million produced in the commodity production process. The three relevant multipliers for the O.R. Tambo District Municipality Vegetable and Fruit Market are the:

- Direct Multiplier
- Indirect Multiplier
- Induced Multiplier (See Chapter 7)

The direct employment multiplier is 2.49 jobs created per million produced. The indirect multiplier is at 1.37 jobs. The induced multiplier is 1.89 jobs (OABS Development, 2015). The total multiplier is 5.75 created per R1 million produced.

The three multipliers measure the total numbers of job created in an ideal economic environment for the Vegetable and Fruit Market. Vegetables and fruit production require substantial seasonal labour activities, especially during harvesting, increasing substantially as the scale of production shifts from small to large-scale production. Indirect job creation via the washing, packaging and transport is limited. Agglomeration

opportunities for local subsistence producers should increase the number of potential jobs as production areas expand. Value-adding processes, such as washing, packaging and storage services, can occur at the Agri-Hub, especially with the proximity of Lambasi to the proposed fruit production areas.

Information that is available on the District's vegetable and fruit production and the potential number of hectares, together with the Bureau for Food and Agriculture Policy, have been used to estimate the employment opportunities that vegetable and fruit production can contribute in the 10-year period. The Agri-Park can provide between 3300 and 6500 employment opportunities from the programme. It must be noted however that these figures are purely indicative and will change through the development of the Agri-Park.

10.11 Contribution to Food Security

DAFF launched a Zero Hunger Policy in 2012 in order to curb poverty and improve food security for vulnerable communities who are in need of support. The Zero Hunger Policy was created to uphold Section 27,1 (b) of the bill of rights which states that every citizen has the right to food and water and Section 28,1 (b) which states that every child has the right to basic nutrition shelter and basic care and social services. The policy suggest that adult daily calorie should be 1792 kcal (7502kj) per day for an adult and sets a food poverty line of R260 per individual expenditure for food every month (DAFF, 2002). Vegetables are an extremely important part of food security as they provide valuable nutrients and minerals required in the day to day diet of all community members. Vegetables provide an abundant, cheap source of fibre and several vitamins and minerals. In general, they have the highest nutritional value when eaten fresh, although an exception may be fermented foods, in which the process of fermentation can increase the content of B-vitamins (FAO, 2001). Vegetables can often be used as staples such as potatoes and various others. Processes which can improve the quality and taste of vegetables are also important and can be performed such as drying, fermenting and pickling (FAO, 2001). These can prolong the life of the goods so that they are used at a later stage when food is scarce or sold on as a value added good. Bottling, canning and packing are important to preserve food for later consumption.

Income earned from the vegetable industry can also be used to purchase food goods in order to be more food secure as well.

10.12 Regulatory Requirements

There are numerous legislation documents governing the production of vegetables. These range from regulations as to the production inputs (National Water Act), to those governing production (Draft Plant Health (Phytosanitary) Bill) and to production standards and consumption. The most pertinent of the acts are contained in Table 11.14

Various other acts and policies are also apply to the citrus industry which are included in Table 11.14 below.

Table 11.14 - Polices Affecting the Vegetable & Fruit Industry

Act	Description
Agricultural Product Standards Act, 1990 (Act No. 119 of 1990) Various vegetables	This act aims to standardise quality norms for agricultural and related products by establishing the criteria for such norms and distributing the information to all interested parties. These criteria may include the quality, packaging, marking and labelling as well as the chemical composition and microbiological contaminants of the products.
Draft Plant Health (Phytosanitary) Bill 2014	Provides phytosanitary measures to prevent the introduction, establishment and spread of regulated

Act	Description
	pests in South Africa and the control of regulated pests. It also provides regulation of the movement of plants, plant products and other regulated articles into, within and out of South Africa include exports of agricultural goods.
Agricultural Pests Act, 1983 (Act No. 36 of 1983)	The purpose of the Agricultural Pests Act, 1983 (Act No. 36 of 1983) and its subordinate legislations is to provide for measures by which agricultural pests may be prevented and combated and for matters connected therewith. The Act also mandates the Directorate Plant Health to regulate plants, plant products and other regulated articles when imported into South Africa. Plants, plant products and related materials are capable of harbouring quarantine pests, which if they enter South Africa with imported commodities and establish, may endanger the South African agricultural sectors. Similarly, pests that occur in South Africa may endanger countries to which we export and as a result South Africa may lose its export markets.
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947)	The act provides for the appointment of a Registrar of Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies; for the registration of fertilizers, farm feeds, agricultural remedies, stock remedies, sterilizing plants and pest control operators; to regulate or prohibit the importation, sale, acquisition, disposal or use of fertilizers, farm feeds, agricultural remedies and stock remedies; to provide for the designation of technical advisers and analysts; and to provide for matters incidental thereto.
National Water Act, 1998 (Act No.36 of 1998)	This act encompasses laws relating to water resources and the use thereof.
Occupational Health and Safety Act, 1993 (Act No.85 of 1993)	The act aims to provide for the health and safety of persons at work and the health and safety of persons in connection with the activities of persons at work and to establish an advisory council for occupational health and safety.
Basic Conditions of Employment Act, 1983 (Act No. 3 of 1983)	The act encompasses those regulations associated with fair labour practices.
Marketing Act, 1968 (Act No. 59 of 1968)	The Act has authorised an establishment and enforcement of regulatory measures to intervene in the marketing of agricultural products, including the introduction of levies on agricultural products.
Consumer Protection Act (Act No. 68 of 2008)	To promote a fair, accessible and sustainable marketplace for consumer products and services and for that purpose establish national standards relating to consumer protection.

Source: Government Gazette (1947; 1968; 1983; 1983; 1990; 1993; 1998; 2008; 2014)

10.13 Substitute Products and Services

Vegetables and fruit are not substituted by other commodities, but are rather substituted between horticultural produce. Vegetables & fruit play a pivotal role in the diet of the population and are very important part of society. Value added products from vegetables & fruit are generally not substituted by many other products.

10.14 Vegetable Barriers to Entry

Barriers to entry are obstacles that make entry into a given market difficult such as regulations, high infrastructure costs or competition in the given area. This section will discuss the barriers to entry of the vegetable industry.

Table 11.15 - Barriers to entry: Vegetables & Fruit

CONSTRAINT	DESCRIPTION	LEVEL OF INFLUENCE
HORTICULTURE BARRIERS TO ENTRY		
CAPITAL, RAW MATERIALS AND PRODUCTION ISSUES		
Climatic conditions	The prevailing climatic conditions determine where horticultural products can be grown. This limits production to certain parts the district, such as the coastal regions for fruit production.	-
Capital intensive	The establishment of new high volume producing vegetable farms is capital intensive. This could prevent small scale and emerging farmers from entering the industry. Farming in hydroponic tunnels is also extremely capital intensive and could prevent entry into the market.	-
Irrigation required	Vegetables & fruit are water intensive crops that require access to consistent water supply. A good irrigation system is required to optimise production.	National
Long Lead times	Fruit trees need to grow for three to five years before they can start producing, and profits can be obtained.	-
COMPETITION AND ACCESS TO MARKETS		
Industry Concentration	The Limpopo Province accounts for the vast majority of South Africa's vegetable & fruit production. Accordingly support services, input suppliers, etc. are located in this province.	-
Lack of post-harvest processing	With the exception of a few industries, the majority of processing for Sarah Baartman District Municipality harvests is outside of the district, meaning that the profits associated with these value-adding activities are not captured by the district.	District.
INFRASTRUCTURE		
Roads	Inadequate secondary road maintenance and development leads to high transportation costs, difficulties in accessing markets and long delivery times, which subsequently can affect all downstream activities.	Provincial

CONSTRAINT	DESCRIPTION	LEVEL OF INFLUENCE
Land	The availability of land to expand vegetable fields is the largest infrastructural challenge facing the forestry in the district.	District
Water	A potential barrier to entry could be the distribution of water rights to new entrants into the industry.	Provincial

Source: Urban Econ, 2015

10.15 Societal and Cultural Trends

Extensive vegetable and fruit production within the district is a relatively new occurrence with little historical, cultural or societal relevance within the former Transkei region. Subsistence vegetable production is practiced within the district, however.

10.16 SWOT Analysis

The following section discusses the Strengths, Weaknesses, Opportunity and Threats of the vegetable & fruit commodity value chain in the O.R. Tambo District Municipality with relation to the Agri-Park. Strengths and weaknesses refer to the positive and negative internal factors affecting the growth of the industry; whereas threats and opportunities refer to the external factors affecting the industry.

10.16.1 Strength

- **Biophysical Criteria**
  - The O.R. Tambo District Municipality is suitable for certain fruit and vegetable production.
  - Port St. Johns is the southernmost point in South Africa in which bananas can be grown.

- **Enterprise Viability Criteria**
  - The market is open for new suppliers, with processing facilities,, street vendors and supply agreements with retailers as option for commodity distribution
  - Vegetables are likely to earn income relatively quickly to other commodities, as production is on a per crop basis.
  - Labourers and emerging farmers are already familiar with vegetable production at one level or another and thus have some skills and knowledge to exploit this sector
  - Implements and infrastructure used for vegetable farming is not excessive. It is accessible to emerging farmers.
  - Vegetable production is easy to finance, based off of socio-economic and political conditions

- **Economic Development**
  - Vegetables have a large degree of forward and backward linkages which indicates that vegetables are useful in many sectors
  - The nature of vegetable farming allows for agglomeration of industries and creates local opportunities for employment
  - Vegetables can uplift a local economy with both food and income into the local GDP
  - It is likely that any vegetables grown locally will substitute any imports of vegetables from other regions and countries

- **Political and Social Criteria**
  - Fruit and vegetable production contribute towards local food security.

- Vegetables are well supported by the government projects that are currently running and planned and there is buy in from the district municipality to increase vegetable production

10.16.2 Weaknesses

- **Biophysical Criteria**
  - Fruit production is only suitable for very specific regions of the district, specifically the coastal regions.
  - Not all areas are suitable for the production of vegetables. It limits production to only certain parts of the district
  - Not all varieties of vegetables are capable of being grown in the district

- **Enterprise Viability Criteria**
  - Existing production occurs primarily as subsistence production, with excess sold to the commercial market.
  - The distance to commercial markets for commodity distribution is quite far, in certain aspects, with production diversified around the district.
  - Vegetables are unlikely to increase local GDP by a large degree as the venture is not as profitable as other agricultural pursuits
  - The nature of certain vegetables makes them unlikely to be transported far distances and thus limits their range. This makes them unlikely to be exported
  - Commodity production is not efficient, large-scale or modernised.
  - Fruit production can expect long payback periods, as, in the case of peaches, mangoes avocadoes and bananas, trees need to mature before production.

- **Economic Development Criteria**
  - Export potential of vegetables is low and thus will limit the markets that vegetables will be available to
  - Lack of infrastructure in remote rural areas in accessing markets, especially for small-scale producers

10.16.3 Opportunities

- **Biophysical Criteria**
  - Export potential of vegetables is low, limiting the number of markets that vegetables will be exposed to

- **Enterprise Viability Criteria**
  - Profit potential in both fruit and vegetable production is high
  - The local market for horticultural produce is increasing as many of these products are household commodities and used in local government institutions (schools, hospital) to ensure food security
  - Horticultural farmers have the opportunity to increase the value of their produce through semi processing which includes washing, packaging, peeling and cutting.
  - The growing market for convenience food can be exploited by horticultural farmers through the creation of local brands linked to small-scale processing activities which supply local markets.
  - There is an opportunity to exploit the open market for vegetables.

- **Economic Development Criteria**
  - Value-adding processing opportunities exist for fruit and vegetables via expanding access to washing, packaging, and transport of the commodity to the market,
  - Local commodity production will reduce the reliance on provincial and national imports of produce into the district, reducing food expenditure for consumers, and contributing to food security, specifically eastern regions who source from KwaZulu-Natal. .
  - Production of high-value crops assists in income equalisation within the district.
  - There are opportunities to create more forward and backward linkages in the vegetable industry such as nurseries which provide farmers with seedlings and processing facilities to value add products

10.16.4 Threats

- **Biophysical Criteria**
  - Climate change poses a significant threat to the agriculture sector particularly in terms of rainfall and access to water
  - New diseases and pests introduced from other countries are an ever present threat to the agricultural sector
  - Incorrect management of crop rotation schemes can damage the land for long periods of time.

- **Enterprise Viability Criteria**
  - Large-scale commercialised fruit and vegetable production have no prior support to rely upon within the district, especially with respect to business plan development.
  - Livestock can gain access into vegetable production areas and destroy crops relatively quickly.
  - The establishment of new high volume producing vegetable farms is capital intensive. This could prevent small-scale and emerging farmers from entering the industry.
  - Local communities may be unwilling to engage in long term commodity production practices, such as fruit (banana, avocado, peaches & mango) farming.
  - Financing options for fruit production are less readily available

- **Economic Development Criteria**
  - Poor training and minimal skills and knowledge in the district can hinder local production due to diseases, poor fertilisation, and other concerns.
  - Specific training and skill sets are required for certain aspects of commodity production, which take long periods of time to integrate into the current district environment.
  - Difficulty in achieving and maintaining commodity exports.
  - High costs associated with refrigerated transport over long distances

- **Political & Social Criteria**
  - Limited access to state/communal land in the district for commodity production
  - Crime and vandalism is a problem within the district, i.e. farming infrastructure.