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INDUSTRIAL DEVELOPMENT ORGANIZATION

**SECO Local Economic Development Assistance  
Programme in iLembe – Value Chain and Cluster  
Development (VCD) Component:**

**Supplementary Report:  
Horticulture (vegetable and fruit) Value Chain**

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**August 2017**



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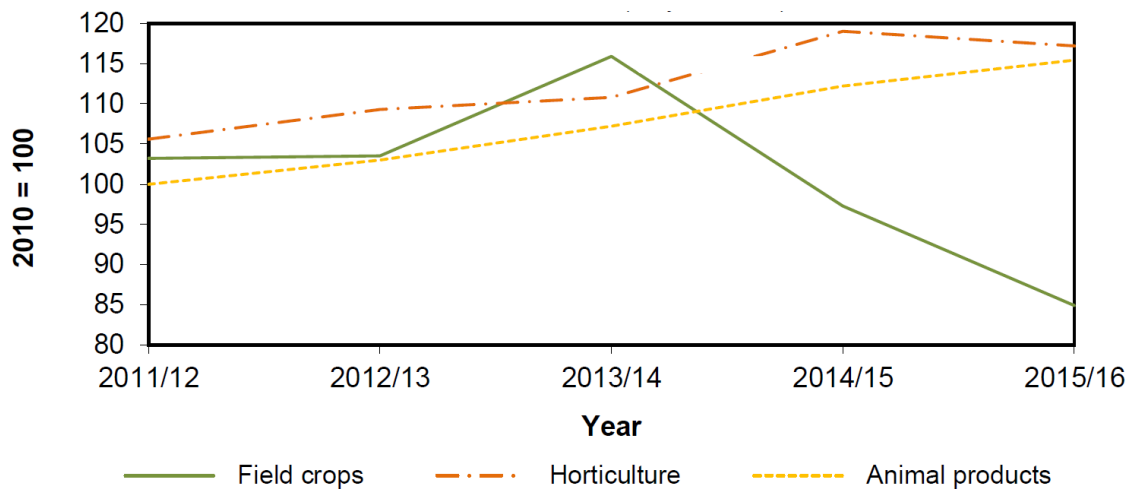
## Acronyms

DAFF	Department of Agriculture, Forestry and Fisheries
SAAGA	South Africa Avocado Growers Association
NFPM	National Fresh Produce Market
WHO	World Health Organization
FAO	Food and Agriculture Organization

## 1 Context

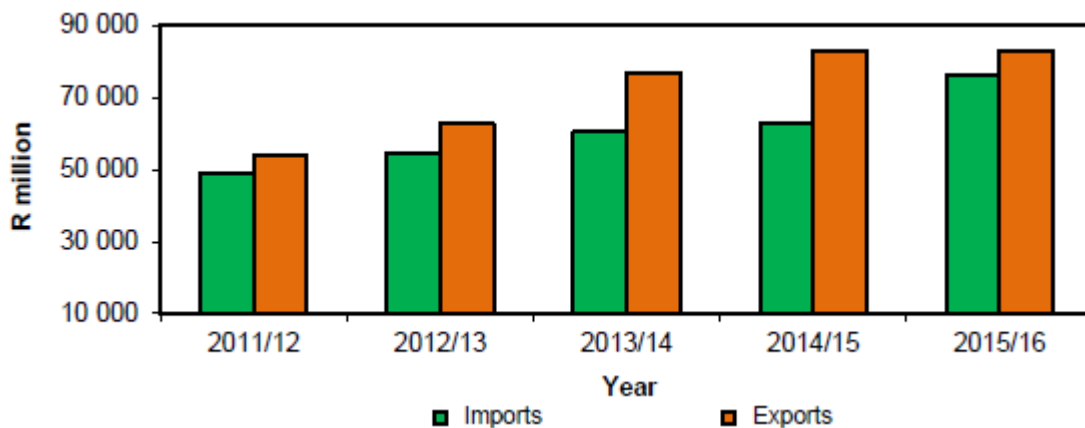
### 1.1. National scenario

According to the DAFF (2016) the estimated volume of agricultural production of South Africa in the year of 2015/16 was 1.6% less than in 2014/15. The total agricultural production includes field crops, horticulture and animal products. As can be seen in the diagram below, the overall production of animal products increased steadily over the last five years, while output of field crops decreased sharply.



**Figure 1 - Volume index of agricultural production**

Horticultural production (fruits and vegetables) has grown during this period, except in the 2015/16 which decreased by 1.5% from the previous season. According to DAFF (2016) this decrease can mainly be attributed to decreases in the production of subtropical fruit, vegetables, citrus fruit and deciduous fruit. Despite this drop in production volume, the value of exports increased by 0.2%, from R82,839 million in 2014/15 to R83,022 million in 2015/16.



**Figure 2 - Import and export of agricultural products**

The Netherlands, with exports value of R8,615 million, the UK (R7,714 million), Mozambique (R6,021 million), Zimbabwe (R5,116 million) and China (R3,946 million) were the five largest trading partners of South Africa in terms of export destinations for agricultural products.

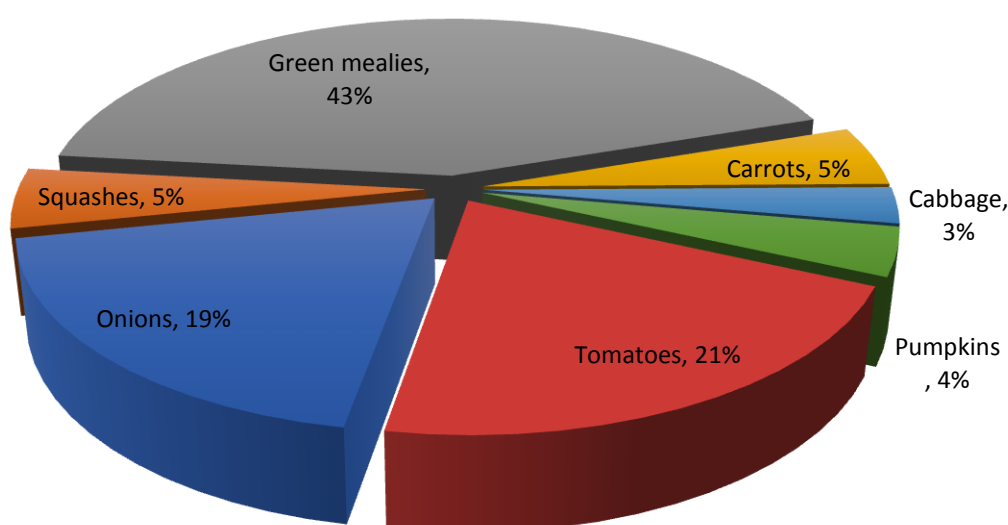
Vegetables are produced in most parts of the country. However, in certain areas farmers tend to concentrate on specific crops; for example, green beans are grown mainly in Kaapmuiden, Marble Hall and Tzaneen, green peas mainly in George and Vaalharts, onions mainly in Caledon, Pretoria and Brits and asparagus mainly in Krugersdorp and Ficksburg.

From 2014/15 to 2015/16 (July–June), the total production of vegetables (excluding potatoes) increased by 1.0%, from 2,832,480 tons to 2,859,745 tons. The production of vegetables (excluding potatoes) in South Africa for the period 2011/12 to 2015/16 is demonstrated in table below.

	2011/12	2012/13	2013/14	2014/15	2015/16
Tomatoes	545	527	538	547	561
Onions	625	596	619	675	687
Green mealies and sweet corn	347	361	362	373	378
Cabbages	141	136	146	146	139
Pumpkins	244	247	245	256	254
Carrots	178	183	184	202	214
Other	591	592	593	633	627
Total	2 671	2 642	2 687	2 832	2 860

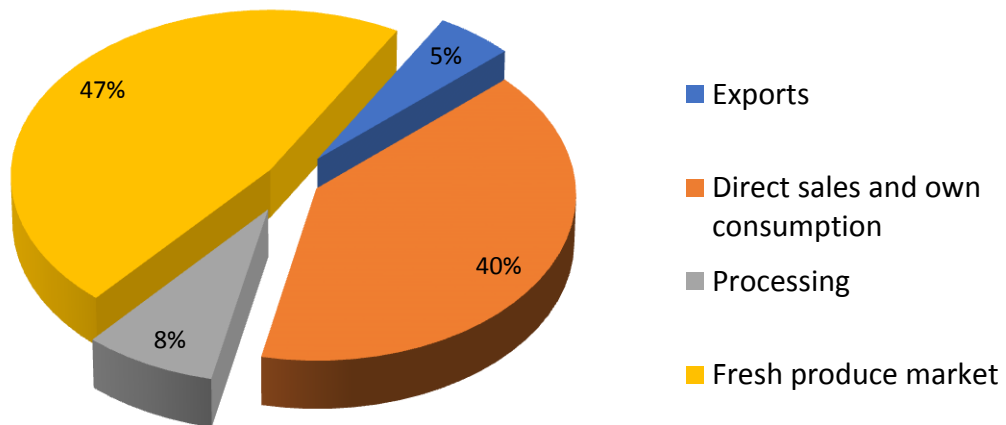
**Table 1 – Production volume of vegetables 2011-2016**

The relative importance of the major vegetable types, according to gross value of production during the 12 months up to 30 June 2016, is depicted in the following graph:



**Figure 3 Relative importance of major vegetables types based on gross value of production**

Figure 4 shows various the relative shares of four market segments channels for vegetables. Approximately 47% of the volume of vegetables produced is traded on the major fresh produce markets. The total volume of vegetables (excluding potatoes) sold on these markets during 2015/16 amounted to 1,308,178 tons.



**Figure 4 - Distribution channels of vegetables**

Figure 5 and 6, presents a generic structure of the fruit and vegetable value chains in South Africa.

**FUNCTIONS**

Specific Unique inputs	Production	Processing	Distribution	Imports & Exports	Retail	Consumption
Selection of Hybrids/Vegetables Fruit, Local Market Consumption Current take off. Suppliers of Seed types Recognised/Accepted demand Lines. Structure selection Irrigation Farm Equipment Structure Custom Design/Handling Equipment. Fertilizers/Agro-chemicals/Biologicals/Water Electricity/Renewable Energy possibility	Land preparation/Align with acceptable Practice. Planting/Plug Bag/Ground. Cultivation Nutrition/PM/Global Gap Specs. Weed control/Scouting Harvesting/Handling Facilities/Collection Systems. Harvesting Customer Requirements	Transportation field/structure to packhouse. Cleaning protective treatment. Sorting/Grading/trimming Chopping/Mixed Bag. Packaging/ Customer Spec Labelling/Barcoding. Supplier/ Grower Tracking Logistics/Label/ Packaging. Designations/ Fresh/Dried	Cold storage Different zones for each requirement. Transportation Local Outside of zone/ Sizes Refrigeration. Markets Supermarkets/ Small Retail/ Auction Floor/Market/ Street Vendors/ Wholesalers	Air freight/ Distance Handling/ Cold Chain. Sea freight Harbour/ Distance Handling/ Cold Chain. ISO/ Global Gap/ Demands Specs/ Phyto Inspection Controls	Merchandising/ reorder and stock shelves. Pricing/ Labelling. Wastage/ disposal manage perishability/ due date. Marketing promotion and advertising, specials	Buying/ decision/ choice between vegetable types, palate preferences, seasonality, out of season availability, choice of quality/ price, packaging

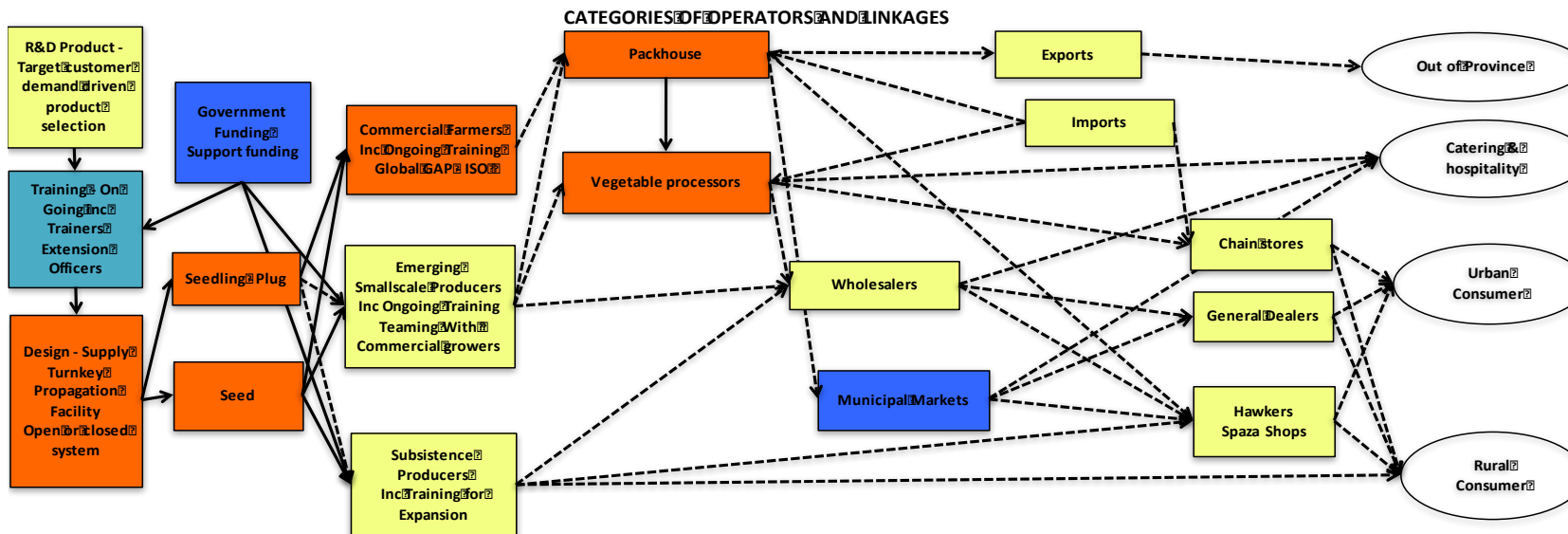


Figure 5 - Vegetable Value Chain



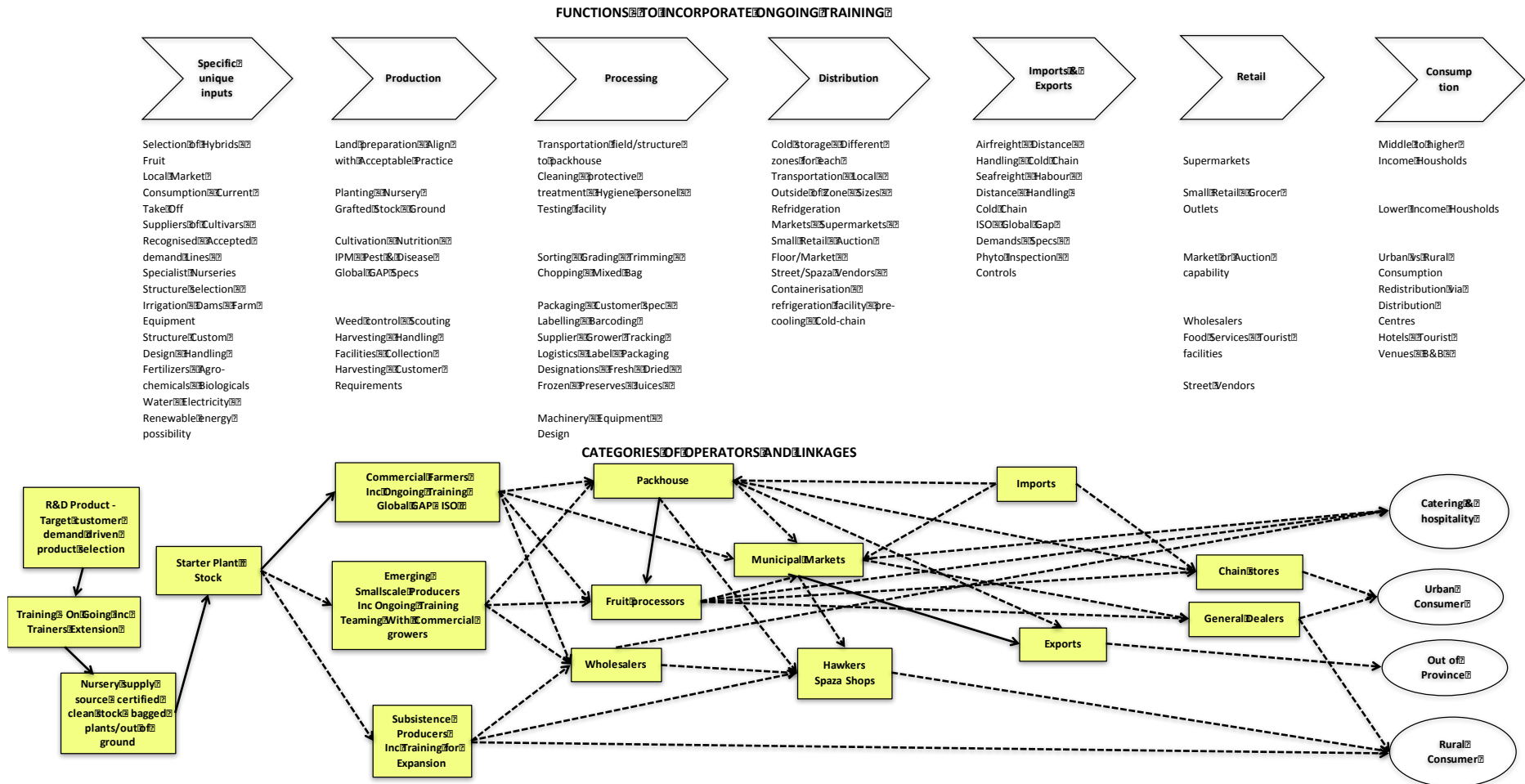


Figure 6 - Generic Fruit Value Chain

## 2 Profile of selected fresh fruits and vegetables

The DARD Bioresource Unit (BRU) programme enables an estimate to be made of the agricultural resource potential of the district. The BRU codes and their respective attributes and crop potential (Fruit, herbs and vegetables only), summarised by Zitholele<sup>1</sup> as best suited to the climate for open-field production are presented in **Table** Table 2.

Vegetable name	
Carrots	Chinese Cabbage
Potatoes	Cabbage
Tomatoes	Pumpkin
Beans	

**Table 2: List of vegetables best suited to the climate in iLembe**

In the next sections a brief profile of four products of avocado, tomato, potato, carrot and cabbage are presented to explain the current scenario of each product at the national and regional level. This will be followed by a detailed analysis of the existing capacities and opportunities in iLembe. The case of macadamia is presented in a separate supplementary report.

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<sup>1</sup> Zitholele Consulting. Baseline Survey and Product Identification for the iLembe Agri-Processing Hub. iLembe Municipality. 2008

## 2.1. Avocado

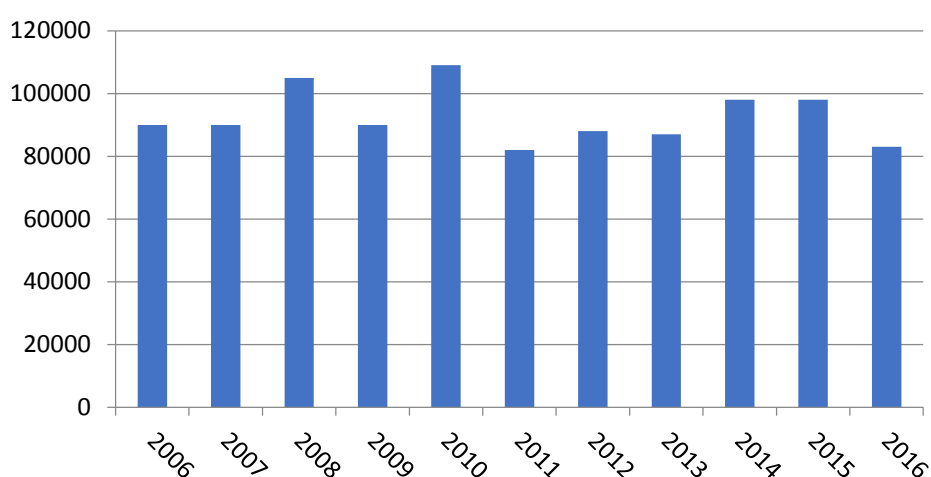
### a. Supply conditions

Avocado is considered a subtropical fruit. The industry measured in terms of value of production, earned R3,500 million in 2015/16—a decrease of 6,5% on the 2014/15 figure of R3,742 million. In terms of volume, production of avocados decreased by 15,000 tons (15.7%). This decrease should be considered within the context of an overall decrease in production of fruits in year 2015/16. Table 3 below shows the annual production volume of various fruits between 2011 and 2016 in South Africa.

Fruit type	2011/12	2012/13	2013/14	2014/15	2015/16
Avocados	88.10	87.00	97.70	98.20	82.80
Bananas	371.30	392.30	463.40	424.40	401.40
Pineapples	108.70	96.80	96.70	95.80	98.90
Mangoes	65.10	52.60	57.60	75.70	41.00
Papayas	12.70	14.90	13.70	15.90	11.10
Granadillas	0.50	0.80	0.70	0.70	0.70
Litchis	7.80	5.60	8.30	8.30	7.50
Guavas	23.70	33.60	31.60	31.90	30.20

**Table 3 – Total production (1000 tons) of selection of fruits 2011-2016**

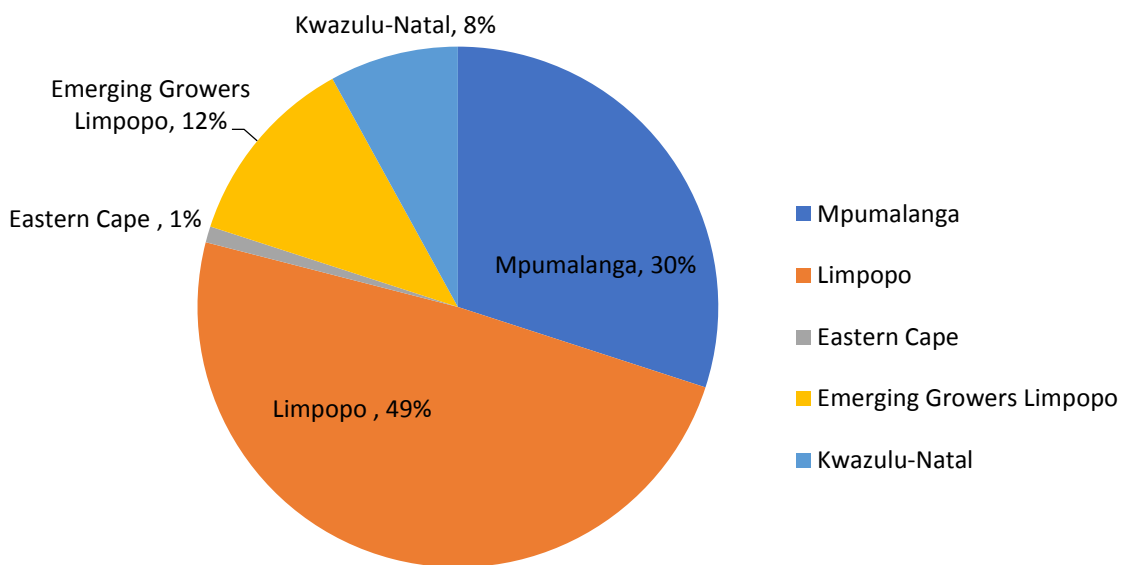
Between 2006 and 2016, the total production of Avocado in South Africa has been fluctuating from 80,000 tons low in 2011 and 109,431 tons high in 2010. Figure 7 illustrates annual production between 2006 and 2016. This is a total production of all various types of avocado. According to SAAGA, the main types of avocado produced in South Africa are Hass (33%), Fuerte (42%), Ryan (11%) and Pinkerton (8.5%).



**Figure 7 – Annual production (tons) of avocado in South Africa**  
Source: Authors 'compilation from DAFF (2011 and 2016), SAAGA (2011)

Due to the climatic requirements, cultivation of some types of subtropical fruits including avocado is only possible in certain specific areas of South Africa. In general, subtropical fruits needs warmer conditions and are sensitive to large temperature fluctuations and frost. According to DAFF the best areas for cultivation of subtropical fruit in South Africa are in the Limpopo, Mpumalanga and KwaZulu-Natal provinces. The production avocado is concentrated mainly in the warm subtropical areas of the Limpopo and Mpumalanga provinces in the North-East of the country and to a lesser extent the Kwa-Zulu Natal province where the conditions are cooler due to the more southerly latitude.

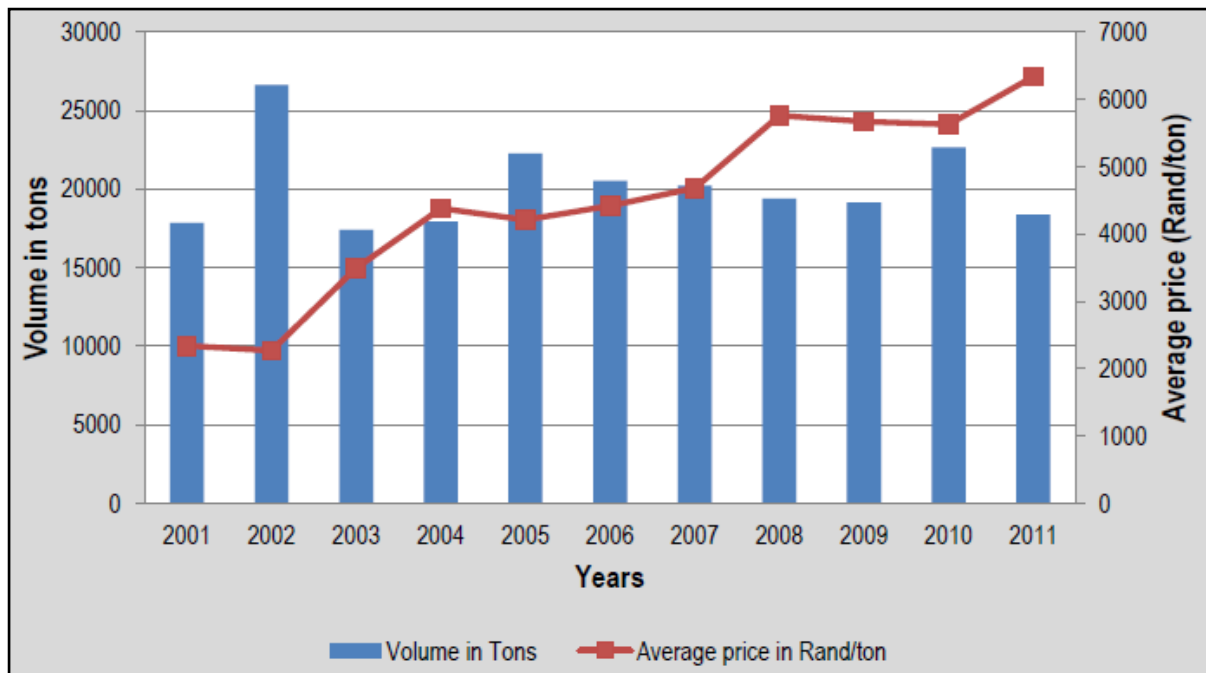
The total production area of avocados in 2015/16 is estimated at approximately 16,000 ha. The diagram below shows share of different provinces in production of avocado.



**Figure 8 – Distribution of production areas**  
Source: DAFF 2011

**b. Market**

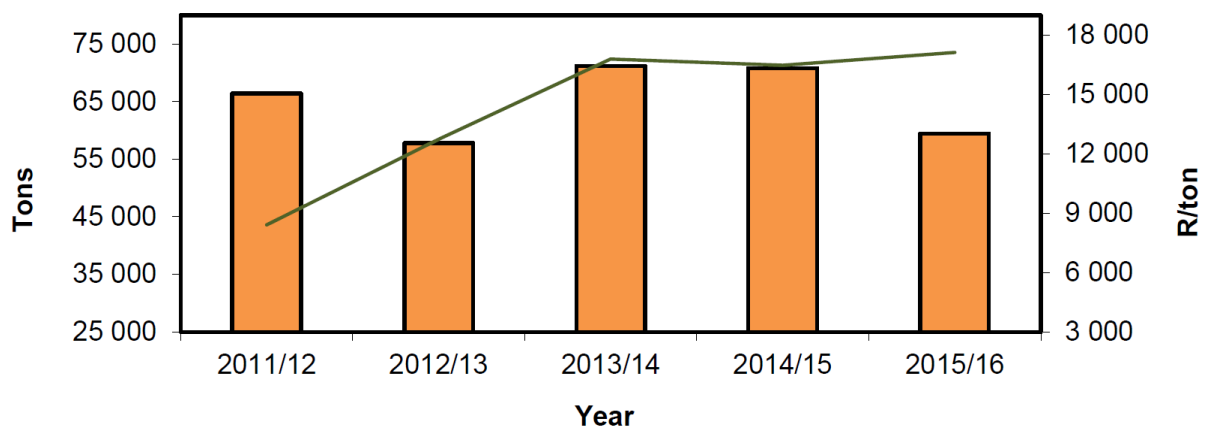
In 2011 almost 34% of total produce was exported while 22% were sold through national fresh produce market, 20% through informal markets (bakkies and hawkers) and 11% through retailers. Only 13% of the total avocado production is being processed. The main two value added products from avocado in South Africa are avocado oil and Guacamole. In 2011, a total volume of 10,600 were processed in South Africa during 2011 of which, 58% was oil and 42% was guacamole.



**Figure 9 – Sales of avocados at the National Fresh Produce Market 2001 – 2011**  
Source: Statistics and Economic Analysis, DAFF 2011

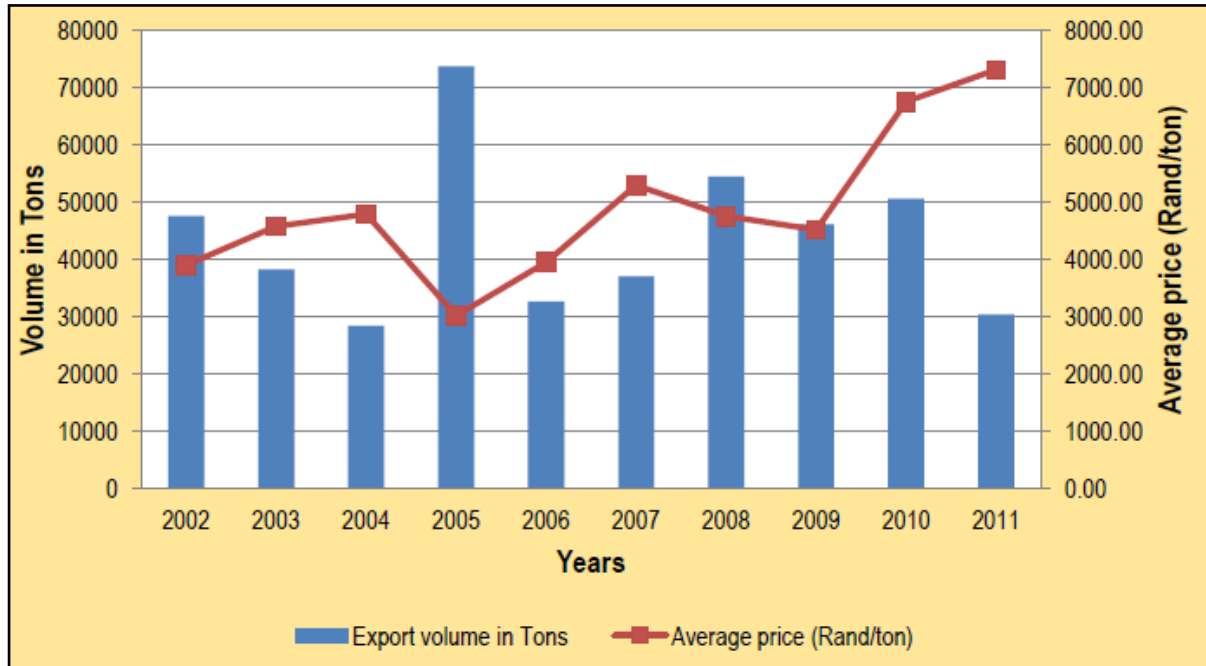
Exports

From 2014/15 to 2015/16, total exports of subtropical fruit decreased by 16%, from 70,828 tons to 59,494 tons and the average export price increased by 3.9%, from R16,484/ton to R17,124/ton. Figure 6 illustrates the quantity and average price of subtropical fruit exported 2011/12–2015/16. Nevertheless, the main subtropical fruit exported by South Africa is avocado. In 2016, share of avocado in total export of subtropical fruits from South Africa was 82.4%.



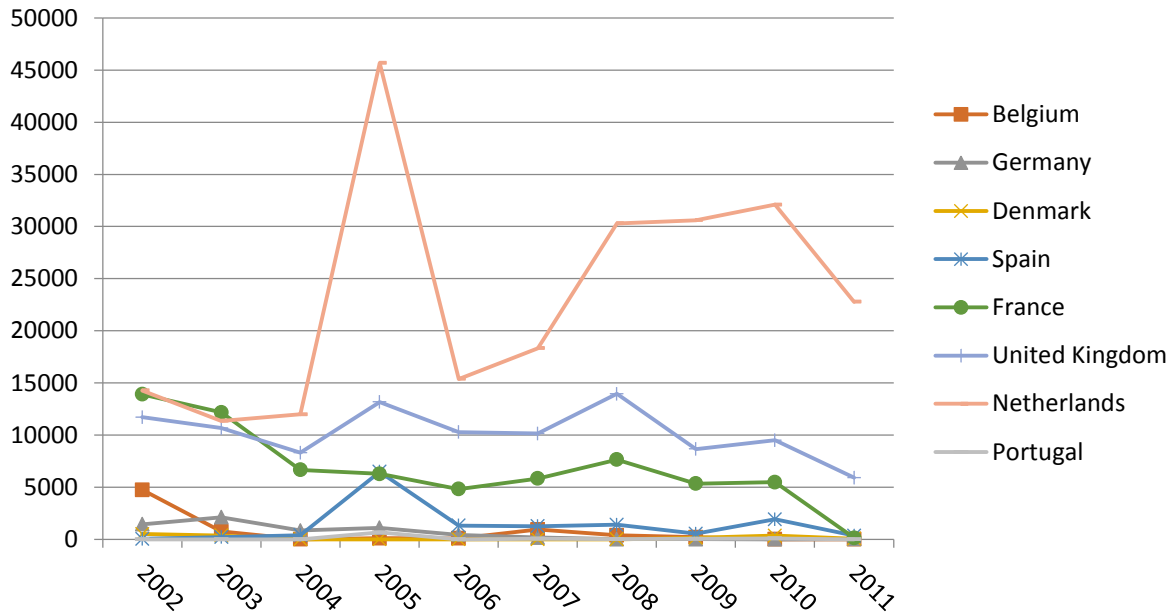
**Figure 10 – Quantity and average price of subtropical fruit exported 2011/12–2015/16**  
Source: DAFF 2016

Although local market has seen a modest and gradual growth in terms of price (Figure 9), the export market has been much more volatile both in terms of price and volume of produce exported (Figure 11). The main reasons behind the rapid decline in 2004 and 2011 of export have been due to quality problems as a result of severe drought and fluctuations in the value of South African Rand. The total share of South Africa avocados in the global market amounts to 2%.



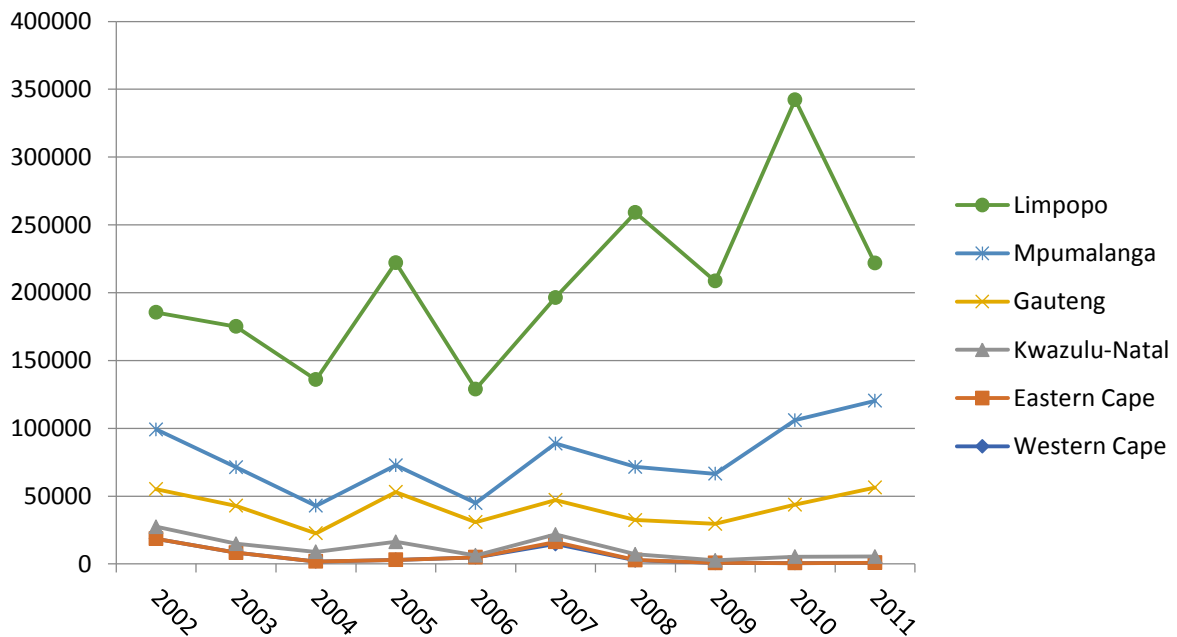
**Figure 11 – Quantity and average price of avocado exported 2002 - 2011**  
Source: DAFF 2011

The main export market for South Africa avocado is Europe (97%) mainly EU. With EU, the key destinations for South African avocados are the Netherlands, France and United Kingdom. Figure 12 below illustrates share of importing countries in the period 2002-2011.



**Figure 12 – Export volume (tons) of avocados to the different EU member states, 2002 – 2011**  
Source DAFF 2011

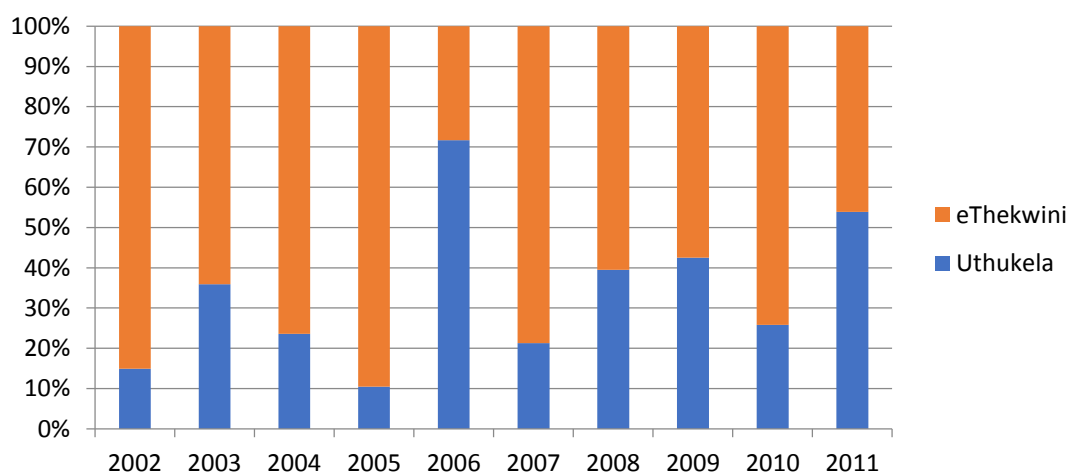
Within South Africa the main exporting province is Limpopo with a share of 46% and the smallest share belongs to KZN with a share of 2% in export from South Africa in 2011. Figure 13 below shows the value of avocado exports by province between 2002 and 2011.



**Figure 13 – Value (R1000) of avocado exports by provinces, 2002 – 2011**  
Source DAFF 2011

### c. KwaZulu-Natal perspective

According to DAFF (2011), the main exporting districts in KZN are eThekweni even though its share has dropped from more than 85% in 2002 to almost 45% in 2011. Uthukela's share in the recent years has grown to almost 55% in 2011.



**Figure 14 – Share of districts in exports from Kwazulu-Natal province, 2002 – 2011**  
Source DAFF 2011

### d. Challenges and opportunities

According to ITC, South Africa's avocado exports have been growing faster than the world imports in the Dutch market. South Africa's performance in this market can be regarded as gains in a dynamic market. However, South African avocado exports have declined faster than the world imports in United Kingdom, Angola and France markets. This major decline has coincided with a general growth in the world imports, especially in countries such as Hong Kong, Saudi Arabia, Malaysia, UAE, Mauritius and Germany. Therefore, South Africa is well position to play a more dynamic role is these markets.

USA, the Netherlands and France are the biggest importers of avocado which together account for 63% of the global import. However, growth rate of imports in countries like Saudi Arabia, Malaysia and Egypt combined (on average 35% growth rate between 2007-2011) has been much more significant than the average global growth rate of imports. Such export markets represent a potential markets for South African avocado producers.

Availability of trade infrastructure in the KZN; in particular the Durban port and Dube Tradeport and the King Shaka Airport, provide a promising opportunity for export of high value products such as avocado to various destinations.

Strength	Weaknesses
<ul style="list-style-type: none"> <li>• Generic promotion of the South African avocados has been successful especially in the UK.</li> <li>• The industry's export operations and leading players are well established.</li> </ul>	<ul style="list-style-type: none"> <li>• Production is largely dependent on climatic conditions which can only be partially manipulated by man through irrigation.</li> <li>• Relatively high input and capital costs.</li> </ul>



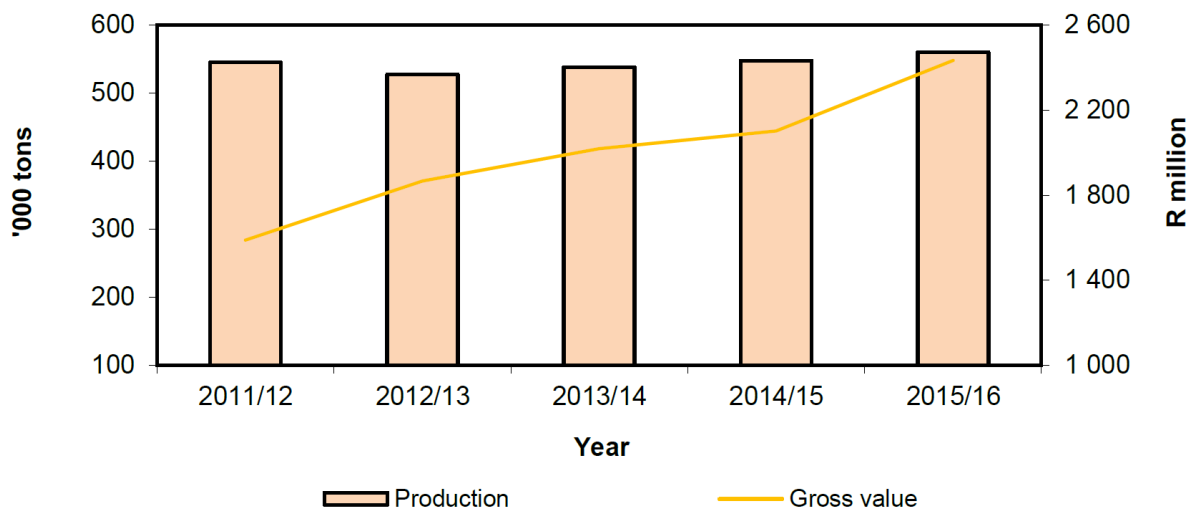
<ul style="list-style-type: none"> <li>• Cooperation amongst the leading exporters has ensured that there is a constant supply to meet the basic requirement by the market.</li> <li>• The South African avocado industry has a strong reputation in major international markets.</li> <li>• The willingness by both the farmers and export agents to make available funds for market research.</li> <li>• Cooperation by RSA and other major role players like Spain, Kenya, Mexico, Chile and Peru in their openness to share market information on national and international levels.</li> </ul>	
Threats	Opportunities
<ul style="list-style-type: none"> <li>• Potential competition from Spain, Israel, Kenya, Peru and Mexico for the lucrative European market.</li> <li>• Port abilities and shipping cycles still pose a threat as delays can easily reduce shelf life by five to ten days</li> </ul>	<ul style="list-style-type: none"> <li>• There is a strong demand in the UK and the rest of Europe in their summer months.</li> <li>• Increasing demand from avocado processing (oil and guacamole) present a potential for growth.</li> </ul>

## 2.2. Tomato

### a. Supply conditions

Tomatoes are produced in all South African provinces. Limpopo province is the major production area with 3,590 ha. The province account for more than 75% of the total area planted to tomatoes. The other main producing areas are Onderberg area of Mpumalanga province at 770 ha and border area of Eastern Cape province at 450 ha. Production is very limited in the winter months and tomatoes can only be produced in frost-free areas during winter or under protection like tunnels.

In 2015/16, production of tomatoes increased by 2.4% compared to previous period and reached 560 418 tons. In the same period the gross value of production increased by 15.8%, from R2.101 million in 2014/15 to R2.433 million in 2015/16. Figure 15, shows the production and value of tomatoes between 2011 and 2016 in South Africa.

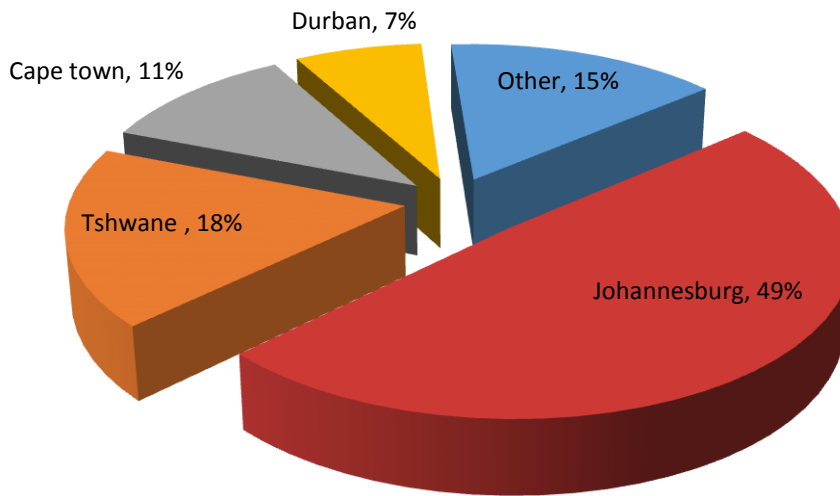


**Figure 15 - production and value of tomatoes between 2011 and 2016**

### b. Market

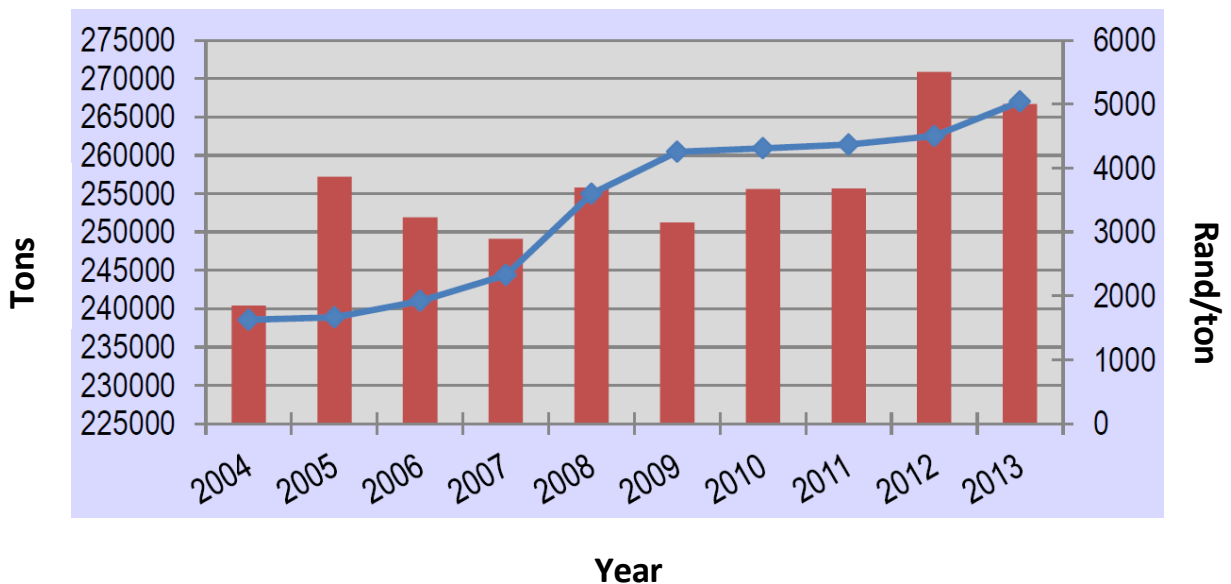
#### Local market

The main market channels for fresh tomato are the National Fresh Produce Market (NFPM) with approximately 47.9% share and direct sales with approximately 25.9% of the total volume of tomato sales. The Johannesburg NFPM is the biggest market, followed by Tshwane, Cape Town and Durban markets. Figure 16, shows relative share of different fresh produce markets in sales of tomato.



**Figure 16 - Tomato share by major fresh produce markets in 2016**

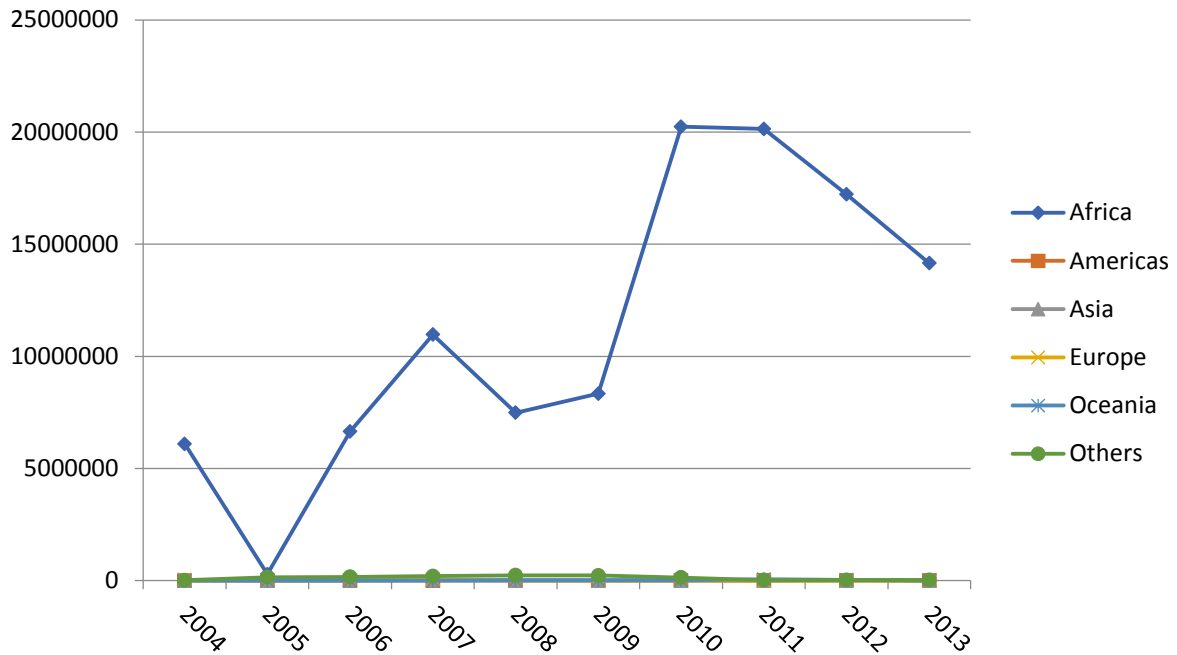
Figure 18 below illustrates the total volume and average price of sales of tomatoes at the major fresh produce market over ten years.



**Figure 17 - Tomato share by major fresh produce markets in 2016**

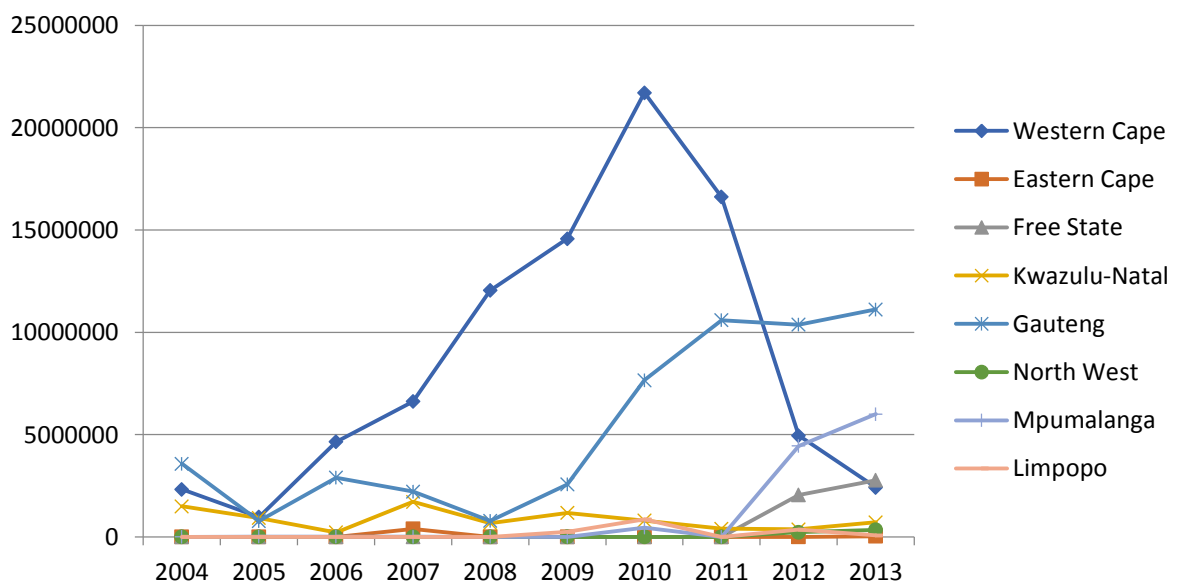
Exports

Tomatoes grown in South Africa are mainly destined for local market. In 2016, only 2.7% of the South Africa tomato was exported. In total the quantity of tomatoes exported increased in 2016 amounted to 13,513 tons mainly. The main destination for South Africa tomato is the countries in the SADC region. In 2016, almost 95% of exports were to Mozambique, followed by Angola and Zambia (3.3% combined).



**Figure 18 Volume (kg) of South Africa's tomato exports to the regions**

Figure 19 below demonstrates share of each province in the total export of tomatoes from South Africa. As can be seen, in the recent years Gauteng and Mpumalanga have increased their share while Western Cape's shares have dropped significantly. However, in the case of Gauteng, tomatoes were not produced locally and only exporters were registered in Gauteng. The same applies for Kwa-Zulu Natal and Western Cape provinces that serve as point of export for the tomato produced locally but also elsewhere in the country.



**Figure 19 - Volume (kg) of South Africa's tomato exports to the regions**



South Africa's regular trading partner such as DRC, Zimbabwe, Malawi and Angola, have experienced negative growth in demand for tomato in the recent years, while according to ITC, in the recent years, South Africa's export to UAE and Zambia has grown faster than the world import. Such growing markets represent major opportunities for export of tomatoes.

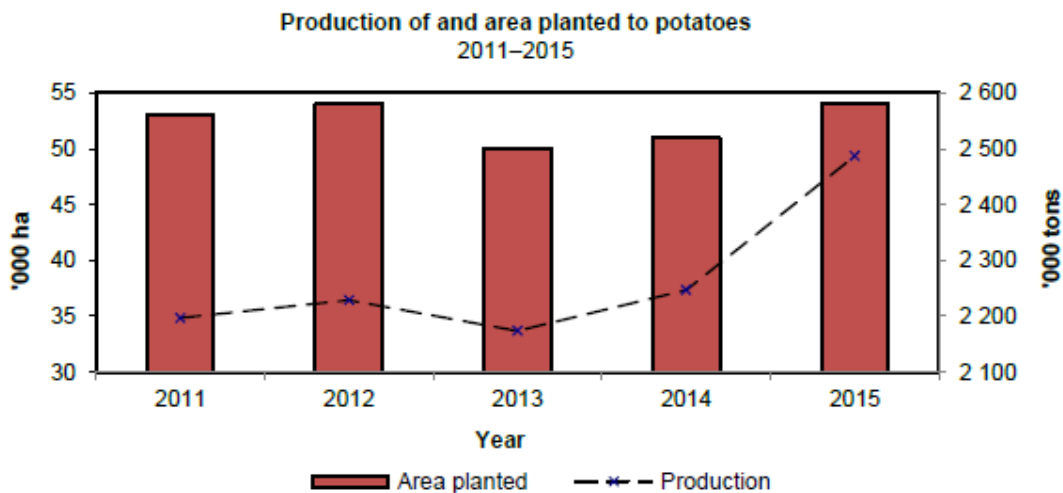
United States of America (USA), Germany, Russian Federation, United Kingdom (UK) and France are main importers of tomato and remain a potential market for South Africa. However, demand for tomatoes in countries such as countries like Mauritius, Rwanda, Papua New Guinea and Swaziland has grown in the recent years. Such markets can also represent possible lucrative markets for South African tomato producers.

## 2.3. Potato

### a. Supply conditions

Potatoes are the most important vegetable crop in South Africa. In 2011, potatoes constituted 61% of the total gross value of vegetable production, 13% of horticultural products and 3% of total agricultural products. The main regions involved in cultivation of potato are located in the Free State, Western Cape, Limpopo and Mpumalanga provinces. Potatoes are planted at different times because of climate differences in the production areas, resulting in fresh potatoes being available throughout the year. In the early 1990s, there was a major shift in production from dryland to irrigation and currently almost 80% of plantings are under irrigation.

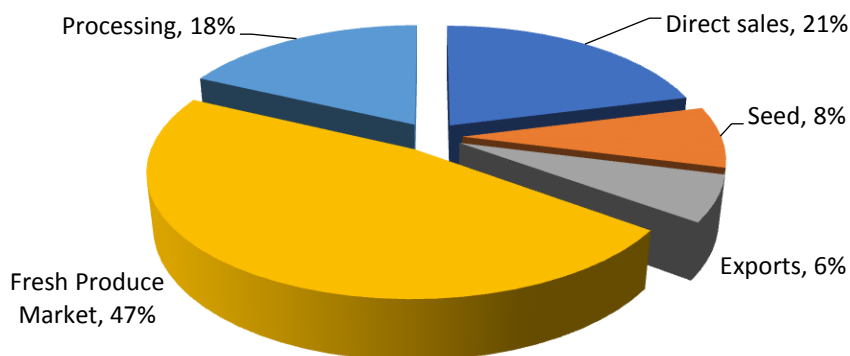
In 2015, a total area 53,933 ha was under potato planting, which showed a 4.9% increase compared to the previous year. Figure 20 below shows the annual growth in production area and output of potato in South Africa.



**Figure 20 Production area and volume 2011-2015**

### b. Market segments

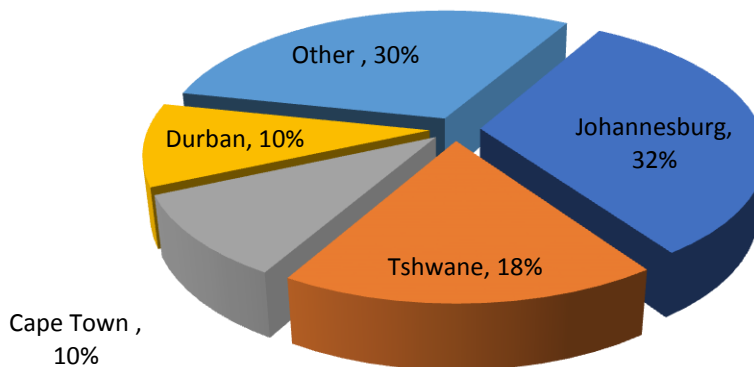
The major fresh produce markets remain an important channel for the sale of potatoes, followed by direct sales (21%) and processing (18%). Only a small portion of cultivated potato is destined for export.



**Figure 21 Market segments of potato**

Local demand

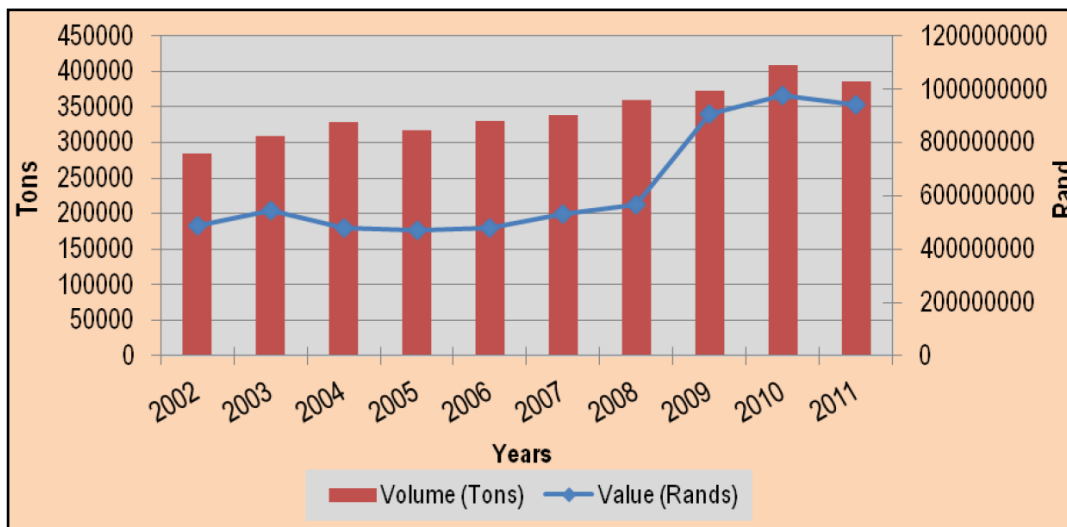
The Johannesburg Fresh Produce Market remains the biggest outlet, followed by the Tshwane, Cape Town and Durban markets. During the five years from 2011 to 2015, potato sales on the major fresh produce markets on average showed an increase of approximately 3,7%. Figure 22, shows share of different major fresh produce markets is sales of potato. With the growth of potato processing industry as well as the large retailers in the recent years, potato producers have started supplying to such markets directly and shifting away from sales at national fresh produce markets.



**Figure 22 Share of National Fresh Produce Market**

Processing

During 2015, approximately 18% of the total potato production was taken in for processing. Of these potatoes, 98.7% were processed into fresh and frozen potato chips. The remaining 1.3% was used for canning and other purposes. According to DAFF, the processing of potatoes showed an increase of 10.6%, from 408,438 tons in 2014 to 451,899 tons in 2015. Higher rates of urbanization and increase in income levels result in higher demand for processed food increase. This has been the main reason behind expansion of potato processing industry in South Africa which is expected to continue in future.

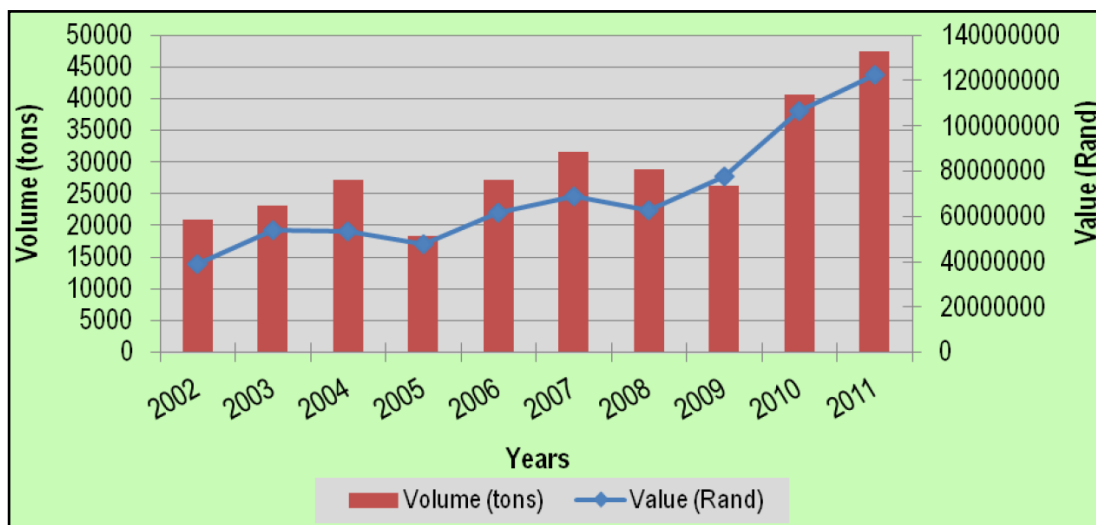


**Figure 23 - Volume and value of processed potato 2002 - 2011**

Exports

Potatoes are easy to grade and pack an under correct conditions, their shelf life is much longer than most other vegetables, which makes it a suitable for export. South Africa however, is not a major exporter of potatoes. South Africa’s share in world export equals to only 0.49%.

The main export market for South Africa’s potato is SADC constituting 98.2% of total potato exports. Despite its relatively small share, exports showed an almost steady growth between 2002 and 2015. In particular exports grew on average annual increase of 19.0% from 2011 to 2015. The main countries importing South African potato in the region are Mozambique (44.3%), Angola (40.9%), Zimbabwe (6.8%), Zambia (3.3%) and DRC (1.8%).



**Figure 24 – Export volume and value of South African potato 2002 - 2011**

Similar to the case of tomato, the main exporting provinces are Western Cape, Gauteng and Kwazulu-Natal. However, these provinces serve as point of export for the potato produced locally but also elsewhere in the country. For instance in the case of Kwazulu-Natal, potato exports are mainly from Ethekwini Municipality, mainly thanks to using Durban harbor as an exit point.

According to ITC, South African potato exports have been growing faster than the world imports in countries such as Nigeria, Zambia and Angola markets, which show a possibly growing export market in future. However, South African potato exports are growing slower than the world imports into DRC, Malawi and Zimbabwe which are among main exports markets for South Africa. More so, Kenya’s demand for potato has increased significantly in the recent years which make it another attractive export market for South Africa.

**c. Challenges and opportunities:**

The shift from dryland cultivation to irrigated farm will continue to have a positive impact on potato industry minimizing its supply fluctuations and subsequently resulting in price stability. With the growing rate of urbanization, especially in the less developed and mostly rural regions it is expected that demand for processed potato will increase. Moreover, the steady growth in export of potato to the SADC region is expected to continue as more countries are considering South Africa as reliable sources of food.





The main challenge to strengthen South Africa's position vis a vis such local and foreign market opportunities is to maintain the quality and quantity of produce. Especially export markets such as EU that observe higher quality and food safety standards require a strong commitment along the value chain to ensure meeting market requirements. Export to the SADC region is sensitive to price of fuel as most of the transport takes place on land this negatively affect competitiveness of South African export of potato. On the production side, lack of infrastructure in remote rural areas impedes access to markets, especially for small-scale producers.

## 2.4. Carrot

### a. Supply conditions

Carrots are considered one of the major vegetables consumed in South Africa. It is among the top ten most economically important vegetables crops in the world in terms of both area of production and market value. Although carrots can endure summer heat in many areas, they grow best when planted in cooler climates. It is difficult to establish carrots in summer because heat, rain and early blights are major causes of crop failure and quality reduction. In South Africa, carrot production is concentrated in the Western Cape, Gauteng, Free State, North West, Kwazulu-Natal and Mpumalanga. Between 2002 and 2011, production of carrots has grown steadily. Figure 25 below shows the total volume of carrot produced in South Africa between 2002 and 2011. In 2016, the total production reached 214,000 tons a record high in the past 15 years.

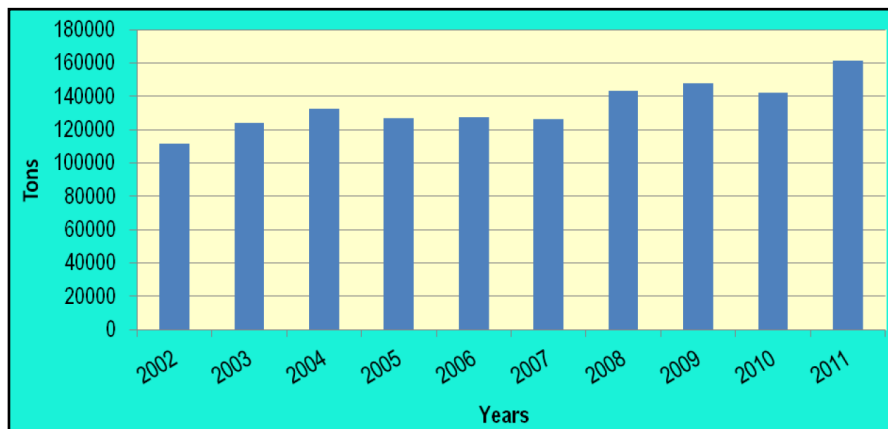


Figure 25 –Volume of South African carrot 2002 - 2011

### b. Market structure

Three main outlets exist for carrots produced in South Africa. The largest market segment is the local consumption of fresh produce through NFPM. This constituted more than 80% of the market in 2011, followed by 14% for processing and 4% exports. Figure 26 illustrates South Africa’s carrot market segments.

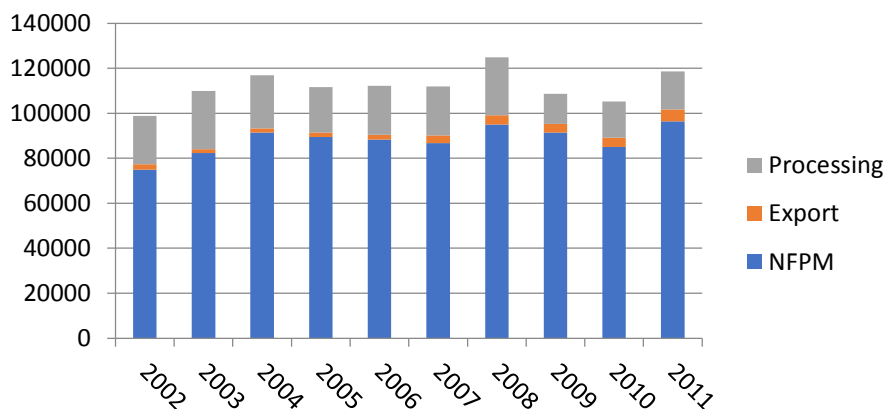
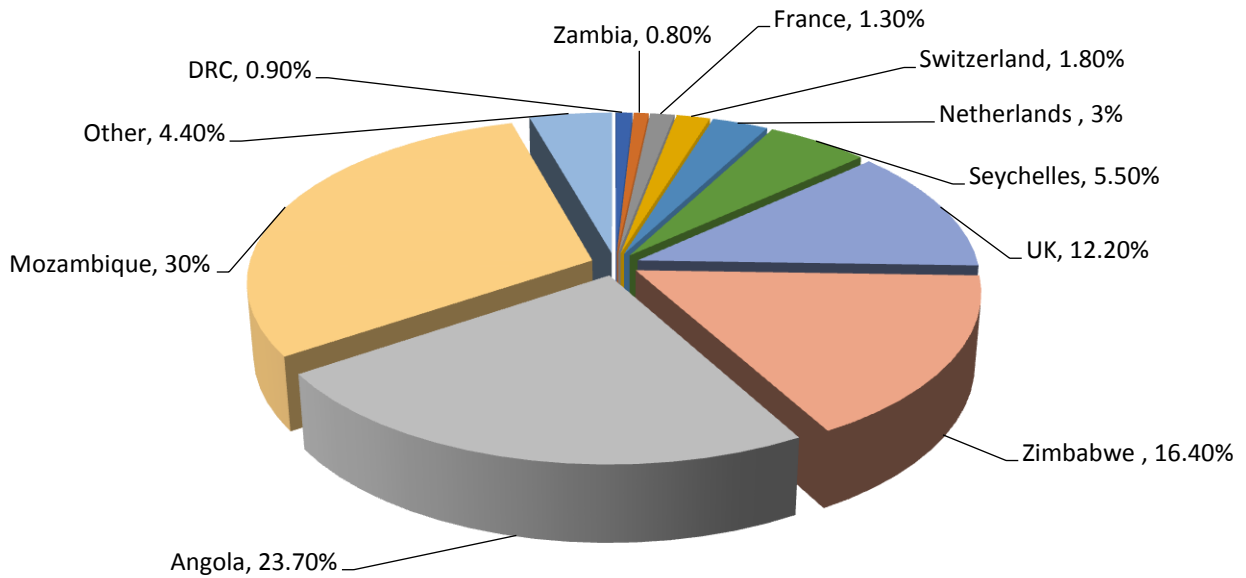


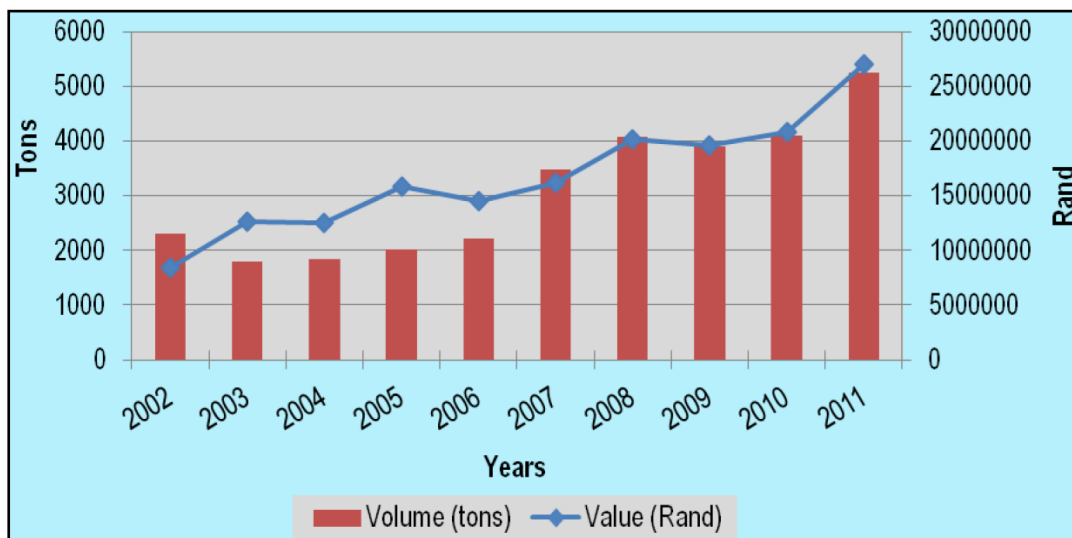
Figure 26 – Volume of South African carrot market segments 2002 – 2011

South Africa is not a major export of carrots; holding a share of 0.34% in the world export market. The main export markets for South Africa’s carrots are illustrated in figure below.

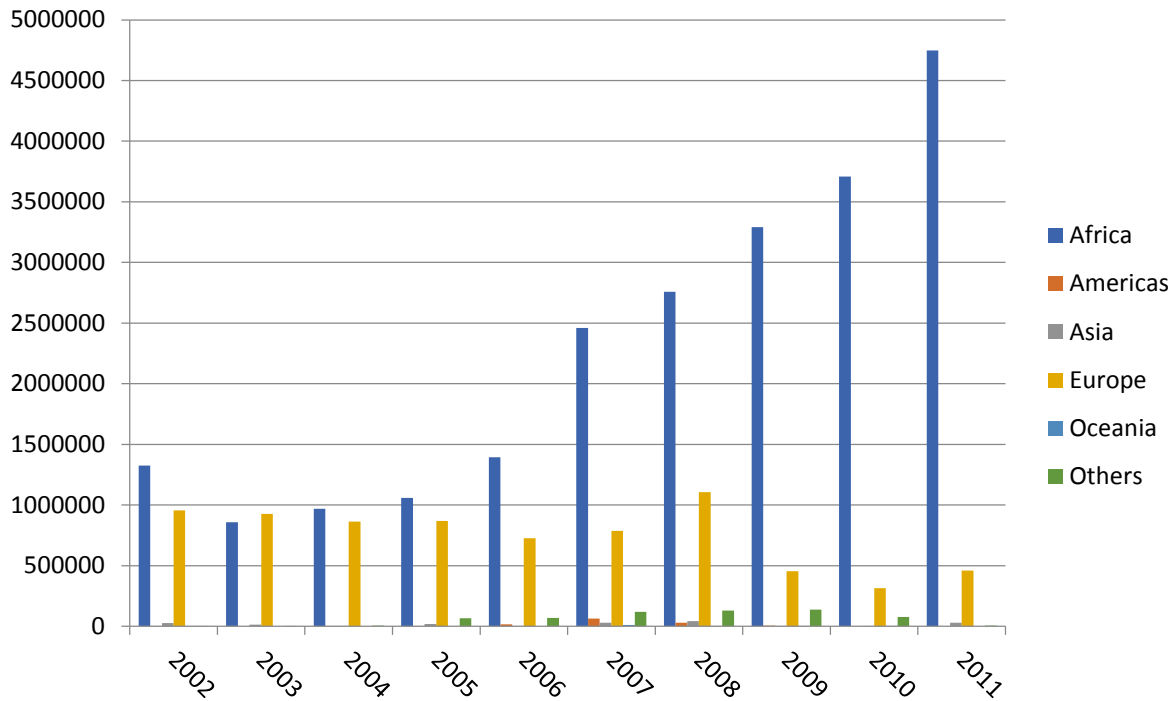


**Figure 27 – Export destination of South African carrot**

In terms of significance, the value and volume of export of carrot from South Africa has grown steadily since 2002 (Figure 28). Among different export destinations, Africa has been the main contributor to this growth (Figure 29).



**Figure 28 – Export value and volume of South African carrot 2002-2011**



**Figure 29 – Regional distribution of export volume (Kg) of South African carrot 2002-2011**

As can be seen in Figure 29, the volume of export of carrots to Africa has grown significantly and steadily since 2002, while during the same period exports to Europe has decreased. The growth in exports to Africa, especially Mozambique, Angola and Zimbabwe can be explained by the cheaper cost of transport of fresh produce. The main exporting provinces are Western Cape, Gauteng Free State and to a lesser extent Kwazulu-Natal. A similar reasoning; that of presence of export infrastructure in Cape Town and Durban can explain the high register of exports from Western Cape and Kwazulu-Natal.

## 2.5. Cabbage

Similar to most of vegetables, cabbages are largely produced and marketed through the national fresh produce markets, the informal market and chain stores. Cabbage is used raw in salads, such as coleslaw, as a cooked vegetable, or preserved in pickles or sauerkraut.

### a. Supply conditions

Cool conditions are most favorable for growing cabbage. In South Africa, cabbages are produced in almost all provinces. However, Western Cape, Kwazulu-Natal and Eastern Cape show some levels of concentration. Since 2002, the production volume of cabbage decreased and reached its lowest level in 2007. However, since 2007 the annual production of cabbage has increased slowly to almost 150,000 tons in 2011.

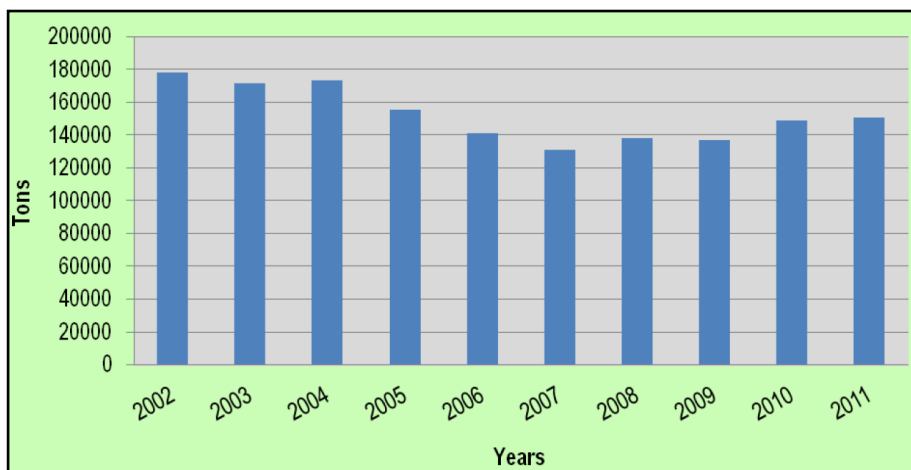


Figure 30 – Annual production volume of carrot 2002-2011

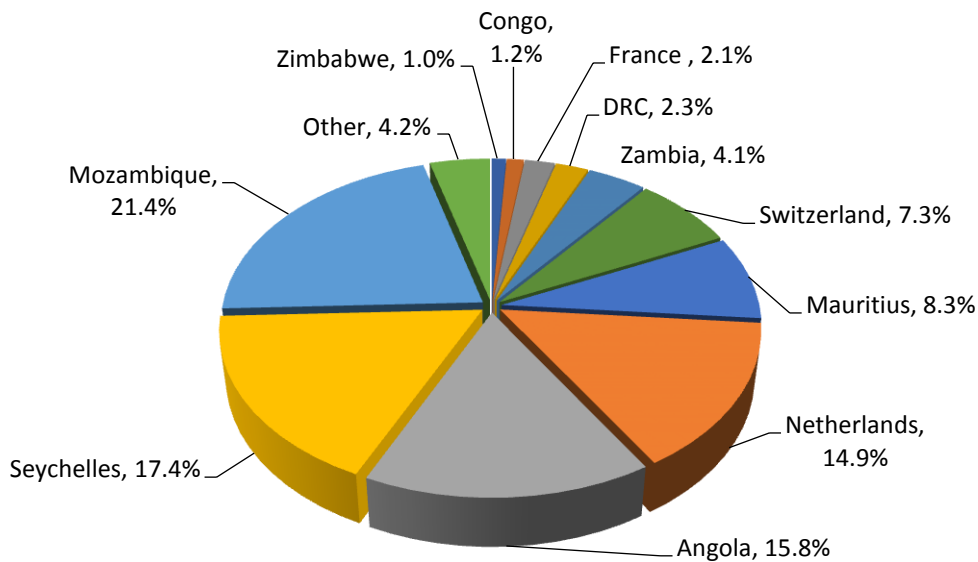
### b. Market structure

Fresh cabbages like most vegetables are sold mainly (78%) through fresh produce market. To a lesser extend (28%) cabbages are sold for further processing, or directly to restaurants, hawkers and retailers and chain stores. A small portion of the local produce is also exported via export agents.



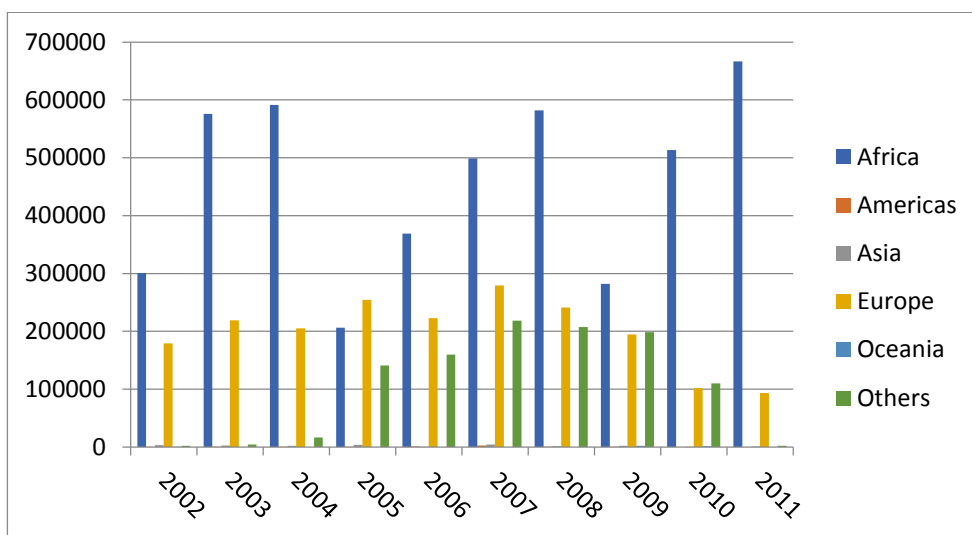
Figure 31 – Annual sales volume and value of cabbage at NFPM 2002-2011

South Africa is not a major exporter of cabbage; in 2011 its share in the world export was only 0.04%. The main export markets for South Africa cabbage have been Mozambique, Seychelles, Angola, the Netherlands, Mauritius and Switzerland. The Figure 32 illustrates share of various exports markets for South African cabbage and Figure 33 illustrates the export volume of South African cabbage to different export regions between 2002 and 2011, which has been dominated by Africa and followed by Europe.



**Figure 32 – Export destination of South African cabbage**

Various value addition options are possible for cabbage. Fresh cut cabbage can be used in its raw form in salads such as coleslaw and ready-made packed salad. Cabbage is also dehydrated in the form of dried, flaked or powder to be used as a flavoring ingredient in food. Cabbage can also be pickled and canned.



**Figure 33 – Regional distribution of export volume (Kg) of South African cabbage 2002-2011**

### 3 iLembe Perspective

#### 3.1. iLembe

The iLembe District Municipality is made up of four Local Municipalities of Mandeni, Maphumulo, KwaDukuza and Ndwedwe. The configuration of these LMs, relative to each other is shown in Figure 34.

The LMs of most interest in this study are the coastal municipalities of KwaDukuza and Mandeni, recognizing there is always some relational spill-over between municipalities based on sector and geographic practicalities.



Figure 34: iLembe District Municipality

### 3.2. Agricultural Potential of iLembe

The provincial department of Agriculture and Rural Development (DARD) have a system of assessment of the agricultural potential of a range of bio resource units (BRUs)<sup>2</sup>. The spread of BRUs are presented in the map below, Figure 35.

A description of the various crops generally suitable to each of the BRUs is set out in Annex C. Whilst there is a wide-ranging set of potential crops sugar cane production dominates the KwaDukuza and Mandeni local municipalities.

There are also a range of vegetables and herbs indicated as having potential such as cabbage, carrot, tomato, potato, green beans and dry beans.

In addition the dominant potential for fruit is that of banana but only under irrigation. As banana has potential it is also an indicator for Macadamia, litchi and possibly mango but the latter would have to be irrigated ideally.

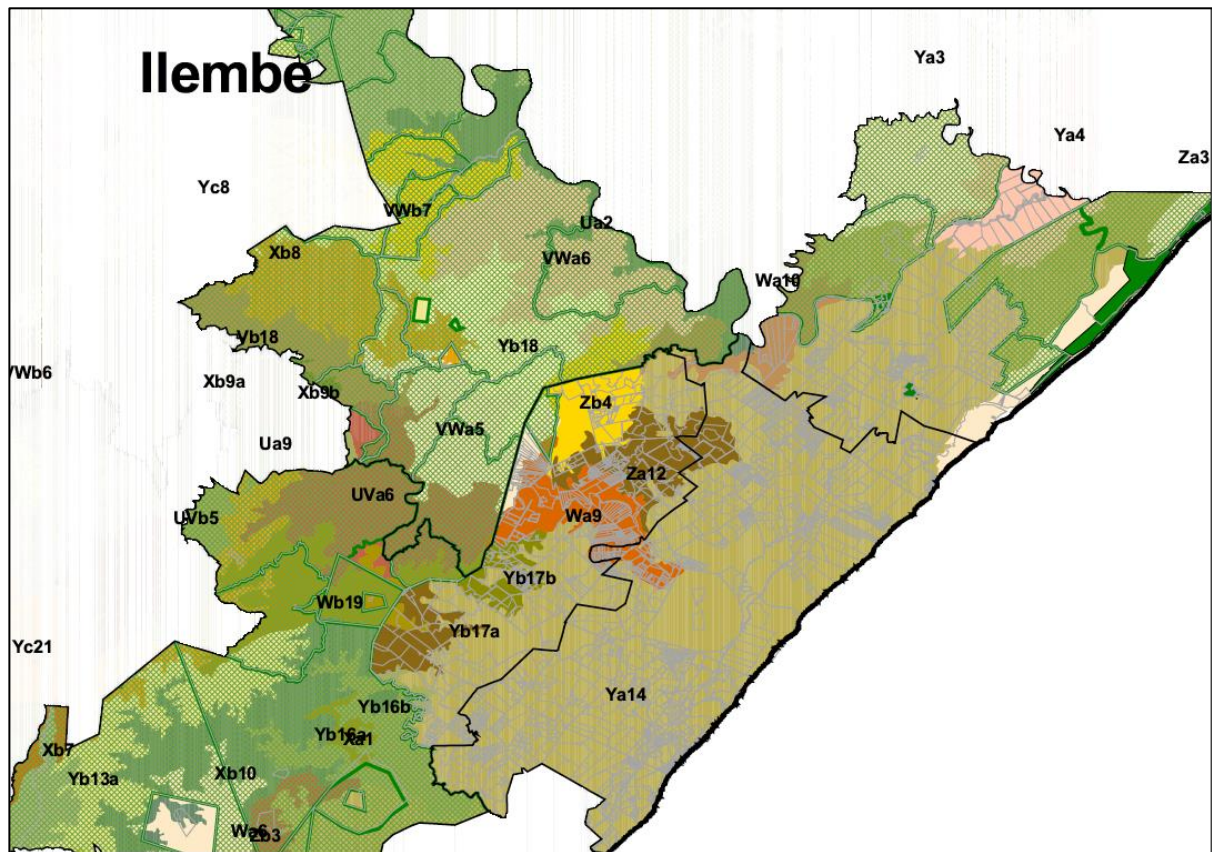


Figure 35: iLembe District Business Resource Units

<sup>2</sup> A Bioresource Unit is a demarcated area in which the environmental conditions such as soil, vegetation, climate and, to a lesser degree, terrain form, are sufficiently similar to permit uniform recommendations of land use and farm practices to be made, to assess the magnitude of crop yields that can be achieved, to provide a framework in which an adaptive research programme can be carried out, and to enable land users to make correct decisions (after Scotney, 1986).



For micro scale and SME vegetable producers to be fully integrated into a value chain, supplying high value products to consumers through the existing chain of actors across functions, requires several basic building blocks (key success factors), without which there will be no success. These are:

- Suitable land with irrigation;
- Production management skills of the operator to achieve quality products compliant with the market standards;
- Adequate equipment for land preparation, planting and transport
- Working capital to invest in production over a three to four-month period before income is earned;
- Access to a cold chain within a short space of time after harvest;
- Access to a market;
- Business management skills.

As an example of initiatives to assist emerging black SME vegetable producers Enterprise iLembe have been promoting the development of both open field and tunnel vegetable producers since circa 2008. Even after 9-years of support these producers are still struggling to be independently successful albeit several studies, assessments and recommendations. Currently efforts support production and marketing through the schools feeding scheme.

### 3.3. Supply conditions

It is difficult to accurately determine the numbers of vegetable producers and the scale of production as there is no single point of representative body or association where this type of information is recorded. At best an estimate has been made from an aggregation of several sources. Estimation, within the limitations of reliable information, of numbers of small scale commercial vegetable farmers, extracted from opinions received during fieldwork is presented in the table 4 below:

Local Municipality	Area (ha)	Number of growers	Production Estimate (Tons)
Ndwedwe	364	1,513	1,758
Maphumulo	239	83	2,390
KwaDukuza	280	30	4,200
Mandeni	75	103	1,125
<b>Total</b>	<b>958</b>	<b>1,729</b>	<b>9,473</b>

**Table 4: Estimated total vegetable production area of small to medium sized producers**

The range of vegetables produced by small to medium-sized farmers in iLembe as per the DARD is summarised in table 5 below, with total approximate yields of 347.50 tons per annum.

Crop	Number of farms	Ha under production -	Assumed level of production (tons)
Amadumbe	3	4	60
Beetroot	1	1	14
Brinjal	1	1	15
Cabbage	5	2	60
Calabash	3	8	64
Carrot	3	1.5	30
English cucumber	1	0.5	6
Lima Beans	3	4.5	22.5
Luffa	1	1	12
Macadamia nuts	1	12	24
Onions	1	0.5	10
Spinach	1	0.5	10
Turnips	3	5	30

**Table 5: Estimated vegetable production area of small to medium sized producers supported by DARD**

*Source: DARD as per Zitholele (2008) with yields estimated by Andisa (2017)*

### 3.4. Profile of Smallholder Vegetable Production in iLembe

#### a. Individual fruit producers Strawberries

Strawberries were one of the few commercial fruit operation identified and offers some useful insights to the challenges in start-up businesses by emerging SME businesses in the agricultural production space. There is one producer near Ballito; Cappeny Estates, owned and run by Mr Xolani Gumede<sup>3</sup> and his wife. Their operation and situation is unique but highly illustrative of what it takes to develop a new farming venture, especially if you are a first-generation farmer, without local farming knowledge and generational history of experience in the crop to fall back on.

<sup>3</sup> Mr Gumede is also Chairman of the iLembe Chamber of Commerce



**Figure 36: Mrs Yoliswa Gumede and Mr Xolani Gumede**

Entering farming is not an overnight decision, it takes much careful thought and research and if you are not able to undertake the necessary advance research setbacks are inevitable. It is then all about how quickly and cost effectively these setbacks can be managed that determines ultimate success.

Xolani Gumede at Cappeny Estates is atypical in many ways. Moreover, he has received significant support from iThala Bank and from the Agri-Business Development Agency. Such individual and highly isolated farmers are suitable for a well-tailored support by the LED Programme. With regards to Avocado the same holds; although the export potential is evidently higher than strawberries. Therefore, support programme to the very few avocado producers should focus on increasing their supply capacity through facilitating financial support and on the other hand establishing or strengthen their position vis a vis export markets through partnership with export agents such as Hall and Sons (see box1). Moreover, entering export markets would require high quality standards which would necessitate a specific quality focus in the support programme.

In Mr Gumede's case he was a property developer and a consultant in the building industry. Cappeny Estate was originally targeted as a property development opportunity but the land needed to be productively used in the interim. He apparently appraised researched approximately 20 varieties of flowers and 10-15 types of berry fruit. Before concluding that in his analysis, he should invest in the production of strawberries. This decision was based on the indicative high per unit profitability that could be achieved on a relatively small area and proximity to the King Shaka International airport if exports were to become an option.

### Production

A critical issue in farming is to match the crop and/or choice of variety to the bioclimatic characteristics and more specifically the micro-climate of the production site. Strawberries do best in a cool dry climate as they need a certain number of chill units and a dormancy period to stimulate flowering and fruiting. The local area is classified as sub-tropical region with an above average rainfall. This resulted in a few years of trial and error with variety selection and consequently low yields, which impact cash flow and in all such cases places strain on finances.

Mr Gumede noted that the local (in ZA) availability of plant material for varieties of strawberries that could tolerate KZN's heat and humidity (varieties grown in California and Florida) also contributed to XG's decision to go into strawberries. Having the appropriately skilled advisers

whose interests are aligned with the farmers is critical. Some of the early advice from “so-called” experts on variety selection was not sound.

Developing the infrastructure is an expensive undertaking and a suitable financing package is a key success criterion. There is approximately 4 hectares developed to open field and tunnel production in 27 tunnels to control the micro climate.

Cappeny is currently producing approximately 100 tons of strawberries per annum divided roughly equally between frozen and fresh sales. While frozen strawberries do not attract a high price, the Gumedede has identified the installation of technology that allowed Individually Quick Frozen (IQF) as an objective as he would realise a slightly higher price R15-20/kg. But the ultimate objective where it feasible would be to freeze dry strawberries, a product that can realise prices of up to R600/kg.

Another aspect, which is often a challenge when outside finance is the alignment on the disbursement to meet the seasonal establishment requirements. If the ideal planting season is missed this can delay projects by a year, with negative cash flow consequences.



**Figure 37: Cappeny Estates infrastructure<sup>4</sup>**

For irrigation projects care needs to be taken that the water quality is suitable. In the case of Cappeny given its location the water may be high in salts.

#### Market potential

The local markets take all the product and these are through the major chains such as Freshmark (Shoprite), Food Lovers Market, various Spar outlets and Oxford Fresh Market. Identifying niche market opportunities is another key success factor and the Gumedede's with their proximity to the Durban consumer and day-tourism markets have launched a 1-day Strawberry Festival, which takes place annually in September. The plan is to grow it into a 7-day event. They also plan other activities to attract day-tourists such as “catch & release” fishing, strawberry themed birthday parties and school-tours to the farm. Gumedede says he has had an expression of interest, through

<sup>4</sup> <http://stuffedfeeling.co.za/2015/09/cooking-up-inspiration-with-xolani-gumedede/>

his agent, from foreign markets, most notably in Mauritius and the UAE. The availability of excess air freight capacity on these routes, served as they are by direct flights with Emirates and SAA means that in due course this may be a realizable export opportunity.

### Services and Infrastructure

Experience shows that conservative financial planning should be undertaken at the outset so as not to underestimate the funding requirements to cover shortfalls when yields may not be initially achieved and/or other start-up challenges are experienced. Having a long-term vision is important and this would usually include expansion. In the case of Cappeny Estates this includes the possibility of leasing sophisticated glasshouse production units at the Dube TradePort AgriZone facility, which falls just outside the District in the eThekweni Metro. The decision to invest in growing strawberries was also taken partly with the high affinity of strawberries for processing and the generation of secondary revenue streams in mind.

#### **b. Independent Individual Producers**

In the iLembe District a small number of mostly relatively small-scale independent individual farmers were identified. Unfortunately it was not possible to identify “critical mass” or a cluster of such farmers. Instead they were very dispersed and is likely to raise the cost of supporting them above what it might have been were there more of them clustered either geographically or by product type. Whether or not their dispersed nature means that they cannot be supported is something that must be determined by SECO LED Programme. But for the purpose of this report we have included notes from some of the examples we encountered.

Although located outside the iLembe District, another example of the specialised single-product operation is the **Qutom Farms** operation located at the Dube TradePort Agri Zone. Here Derek Baird reported that Qutom originally located part of its (mostly Bapsfontein near Johannesburg based) operation there in order to supply local markets. They originally leased 12ha of the 16ha facility at the Agrizone and produced a range of green and red peppers, cucumbers and patty pans. But technical difficulties with what are Dutch-designed cold climate greenhouses – mainly that it is not possible to keep temperatures cool enough in the hot and humid coastal iLembe summer – has meant he has not only reduced his lease area to 8ha but that he has reduced to a single product, English cucumbers. The respondent also indicated that because of the narrow range of production possibilities, value chain development opportunities are also limited since they are product dependent and the vegetables grown in iLembe don’t have a high affinity for processing. He also claimed that export of fresh vegetables from Dube/iLembe is constrained by the relatively high cost and therefore uncompetitive nature of products grown in the area. While he declared himself willing to look at partnerships or outgrower schemes that could share infrastructure and piggy-back on his market access, he said he would be more likely to consider this at his main centre of operations in Gauteng province.

**Errol Dhaniram** is an independent farmer who cultivates English cucumbers and chillies under 2 ha of tunnels on a 9ha plot next to the Ashville primary school just off the R74 from Stanger almost on the border between the KwaDukuza and Ndwedwe local municipalities. He employs 6 people who are the sole beneficiaries of the chilli crop and he supplies the Shoprite-Checkers KZN distribution centre at Canelands near Verulam with English cucumbers in accordance with a

growing programme that he has agreed with them. He has also planted 200 litchi trees on parts of the property unsuited to the erection of tunnels. Dhaniram is constrained by both his small landholding and a lack of cooling and packing infrastructure. As he said, given his market access through the supermarkets, “I haven’t got a market problem but I do have a supply problem”. He has researched avocado production and would appear to be an ideal candidate for SECO-UNIDO support (albeit that he is one of the few independent but very dispersed commercial vegetable producers we encountered) if that included assisting him with business management skills training and help to undertake his business planning for his avocado orchard.

**Ronnie Bloch** at Picketwood Farms near Salt Rock also farms English cucumbers under 3ha of greenhouses. Asked why cucumbers, he responded that this is one of few products that the enterprise economics, market conditions and local bio-agricultural conditions permit. Indeed he was the only producer interviewed who say the upside of the local climate in that it meant there was no need to artificially heat the greenhouses at any point in the growing cycle. He employs 60 staff but is himself reaching retirement age and is looking to sell the business. That it is located amidst a number of upmarket gated housing estate developments poses a challenge to him as he would like to see the business taken over and continue operating for the sake of his staff. But the land he occupies was previously zoned residential and if rezoned residential again, it would price it out of the market of anyone other than property developers. This highlights the matter of competing land-use in the KwaDuzkuza local municipal area and how both sugar cane and now even what little vegetable production there is could be at risk due to urban sprawl.

**Romac**, located at Ballito is a project with a varied history. It was a vegetable farm with 4.5ha under tunnels and shadehouses with a formerly HACCP accredited packhouse. It seems to have functioned well in the period 2008 through 2013 producing produced fancy lettuces, spring onions, cherry tomatoes and herbs. They also bought in large quantities of other vegetables from outside iLembe for processing and packing for Spar (Freshline brand). A majority stake was sold out to Black Balance a BEE company that maintained operations until 2015 when production ceased and the facilities and infrastructure began to fall into disrepair. At some time during the tenure of the BEE company the packhouse operation partnered Enterprise Ilembe under a Department of Cooperative Governance and Traditional Affairs (GOGTA) project to fund and develop 8 new

#### **Box 1: Case Study – Halls**

Halls, a member of HL Hall & Sons Group specialises in the growing, sourcing, packing, ripening, distribution and marketing of quality sub-tropical fresh produce, with a focus on avocado with an annual sales of more than 6 million cartons of avocado.

Working with selected grower partners who operate to the highest international standards of food safety, legality and ethics, Halls procures favoured varieties of fruit from Chile, Peru, Brazil, Columbia, Morocco, Kenya, Tanzania, Swaziland, South Africa, Spain, Israel, Greece, truly reaching around the globe.

Halls also operates packhouses which closely follow specific protocols to ensure the receipt, grading, packing and refrigeration of fruit is completed in an efficient and timely manner whilst covering the all-important parameters of Food Safety, Food Quality, Traceability and Legality.

Post-harvest cold chain management begins from the moment the fruit is picked from the tree. It is the key objective of management to ensure the fruit is collected swiftly from the orchard and delivered for grading and packaging within a defined period.

With Halls' expertise fruit is sorted and graded according to specific market or customer specifications. It then enters the cold chain to be optimally managed through to its destination. With their marketing office in target export markets such as EU, Halls provides the necessary last mile for independent farmers in the South to each their export market.

greenhouses (5 of which were to be in iLembe – 2 in Mandeni, 2 in Maphumulo and 1 in Ndwedwe) that would supply veg to the Romac packhouse for supply to school nutrition schemes amongst others. The then owners focused on the pack house operation buying in raw material and supplying a wide range of vegetables and salads to a range of outlets. They had a mix of own-produced herbs and salad tomatoes but bought in a range of vegetables from either contract growers, located mainly in the KZN midlands. This was augmented by purchases from market agents off the municipal markets to fill gaps in order requirements for their product range. The products consisted of a wide range in salad mixes and mixed vegetable packs to a range in customers, from retailers like the Spar Group to restaurants. This operation ceased in 2015/16.

Enter Radeshni Govender in 2016 who took up a lease on the farm. But, unable to commence with redevelopment and rehabilitation of the farm itself, she also focused on the buying in of vegetables and processing and packing processed vegetables for sale to Spar under the Freshline brand. Although she had ambitions to redevelop the project, which would have required a significant new investment, she was capital constrained. After interviewing her on site, we were to later learn that during the study period the lease was terminated by the owner due to non-payment of the lease (J Schinns, *pers. comm.*). This again illustrates the challenges in this sector. At the time of the sale the indicated volume of quality vegetables they would be able to absorb from smallholders was about 320 tons per annum as per the following list: Baby cabbage, Baby potato, Pumpkin, Broccoli, Butternut, Carrot, Cauliflower, Green beans, Leeks, Marrow, Spinach, Sweet potato, Young cabbage.

Another example of the specialised, own-produced operation, selling a single product line is that of **KwaSizabantu**, the mission located on the R74 midway between Stanger and Greytown in Maphumulo (Note that the pack house is just outside the District but some portions of the farm fall within the District). In terms of vegetables this operation has 2,500 m<sup>2</sup> of hydroponic Multispan Greenhouses, producing about 400 tons of peppers for Woolworths. The business, since 2008 has expanded the greenhouses to 4 ha. In addition, the pack house packs their own avocados and exports through Halls & Son.



**KwaSizabantu Mission Avocado  
Packing**

### c. Open Field producers

Both Enterprise iLembe and the DARD have production support programmes for open field smallholders. The projects are identified as per Table 6 below. Estimated yields from the projects provided based on average yields in these types of projects as per Andisa could be about 2,688 tons per annum. This reconciles from Enterprise iLembe reports that they achieve about 38 tons per week from these projects for the school feeding scheme, i.e. 1,997 tons per annum.

Name	Locality	Ward No.	Size (ha)	Yields (tons)	No of Persons
Ibuya project	Ndwedwe	10	2	30	12
Khanyisani	Ndwedwe	17	2	30	20
Mshiyeni	Ndwedwe	16	5,2	78	13
Sakhisizwe	Maphumulo	7	7	105	34
Embo flagship	Maphumulo	11	5	75	45
Zubane	Maphumulo	18	38	570	581
Nsuze	Maphumulo	1	9	135	52
Okuhlenomuso	Mandeni	11	3	45	11
Emakhuluseni	Ndwedwe	18	38	570	47
Daka Daka	Ndwedwe		133	300	775
Mansomini	Ndwedwe		186	750	646

**Table 6: iLembe Open Field Projects**

*Note the Mansomini and Daka Daka projects form part of the Qwabe Co-operative and due to the failure of the sugar growing projects the DARD has been assisting farmers diversify to vegetable production. The areas provided are the gross areas with irrigation potential and not the area under vegetables. The yields reflected are estimates as per Andisa.*





**Figure 38: Example of a small scale co-operative vegetable farm in iLembe**

Enterprise iLembe (EI) is currently providing subsidised support to a limited number of open-field vegetable farmers within the limits of their budget received from the District Municipality. This budget covers support for mechanisation, limited inputs, facilitation and transportation but not for infrastructure (irrigation, fencing and roads), which is a key component for successful operations. The numbers of growers EI can support within its budget and with those who show commitment has dropped from 63 in 2016 to 20 in 2017. Growers are screened for support based on their (1) consistency of supply, (2) commitment and pro-active approach and (3) proof of positive value add and growth of the business from year to year; i.e. making a profit. This is important because of EI's approach to reduce the subsidy over a period.

The support is aimed at enabling the supply of product to the National Schools Nutrition Programme or "School Feeding Scheme" as it is commonly known. This scheme aims to supply fresh vegetables to schools to provide meals to learners from poorer communities. EI has been contracted by the Department of Education to supply 64 tons per week of fresh vegetables to 402 schools, serving 143,000 learners across the District. These learners are spread between the Local Municipalities of Mandeni (37,000), KwaDukuza (34,000), Maphumulo (36,000) and Ndwedwe (36,000). EI are paid R0.50 per learner for Primary School learners and R 0.60 per learner for High School learners. EI determines the price to the grower, which is reviewed quarterly with the intention of keeping prices as stable as possible, taking account of municipal market prices. The product mix and weekly volumes are: Cabbage (21 t), Onion (8 t), Tomato (6

t), Carrot (6 t), Green Bean (11 t), Spinach (4 t), Butternut (8 t) and fruit (unspecified volume). EI find it difficult to meet the full order from local supplies and report on average achieving 60% and must buy in some 25 to 26 tons weekly, usually from the Durban Municipal Fresh Produce Market

Some 50 local transport service providers, using 1-ton LDVs, are contracted by EI (16 at Ndewedwe, 11 at Maphumulo, 14 at Mandeni and 12 at KwaDukuza) to collect from farmers and bring to 4 hubs, where they are stored in cool rooms over the weekend and then delivered to the schools from Monday onwards. These transporters are paid R 4.50 per km. The hubs have a staff of 3 who do the loading and unloading and oversight is provided by the 4 EI extension officers. One of the biggest challenges is the dispersed nature of schools, the poor road conditions and the topography that creates long distances between schools even though they may be close, as the crow flies.

EI provides a co-ordinated planting programme but wants to get a longer-term (3-year) contract with the Department to provide more certainty for growers to commit to a long-term planting programme. In addition, EI also has facilitators to assist groups of farmers form a co-operative, set the constitution and get it registered.

The types of challenges faced are:

- Poor road infrastructure;
- Challenges of making regular and timely payments to farmers;
- Integrated and timely funding for irrigation, fencing, on-farm handling, inputs;
- To successfully produce Cabbage, Spinach, Onion, Tomato and Carrots one needs irrigation, whilst Butternut and Green bean can be planted seasonally under dryland conditions.
- Technical support in production practices;
- Training in mechanisation, maintenance and operation of tractors and equipment;
- Training on pest and disease control;
- Co-operative governance support.

The view expressed by the EI officers is that Maphumulo offers the best opportunities for expanding vegetable production on a small-scale level given the availability of more land, the cooler climate

EI extension officers estimate the numbers of SME individual farmers supplying to direct markets they have established themselves are:

- KwaDukuza – 3;
- Ndwedwe – 0;
- Mandeni – 2; and
- Maphumulo – 0.

Expected yields from these 5 commercial producers is roughly indicated at 2,250 tons per annum based on 30 ha production each an average yield of 15 tons/ha.

An example of a successful SME producer of vegetables and speciality crops like ginger is that of the Nohari family. This operation some 20 km inland from Ballito is run by a family with four generations of successful vegetable farming, with the current owners' great grandfather having

started off leasing 6 ha in the Upper Tongaat area. Now the 4 brothers and their sons have each contributed 35 ha to a family joint venture; Polyan Farms. In addition, they lease land from commercial cane farmers for 1-year periods while the land is fallow, between cane crops. In total, they produce on 280 ha - 300 ha, depending on how much leased land they have at any one time. They have a mixed farming enterprise, growing sugar cane, litchis, and a range of vegetables including madumbies (a type of yam), sweet potatoes, ginger, turmeric, lima beans, luffas, okra and calabash. Income is split about 50/50 between sugar cane and vegetables. The family has a Global GAP accredited pack house with an average throughput of 45 tons per month i.e. 540 tons per annum.

Product is sold to Woolworths, Checkers, Pick n Pay, Spar and other smaller retailers. In addition, they sell on the Durban Farmers Retail Market; mainly to hawkers and street traders.

This family is happy to undertake joint ventures with emerging black farmers on the basis that they will lease a specified area from the emerging farmer but require the emerging farmer farm for own account on an equal area of land under their tutelage. Currently they are mentoring the Qwabe Co-operative produce 180 ha of beans.

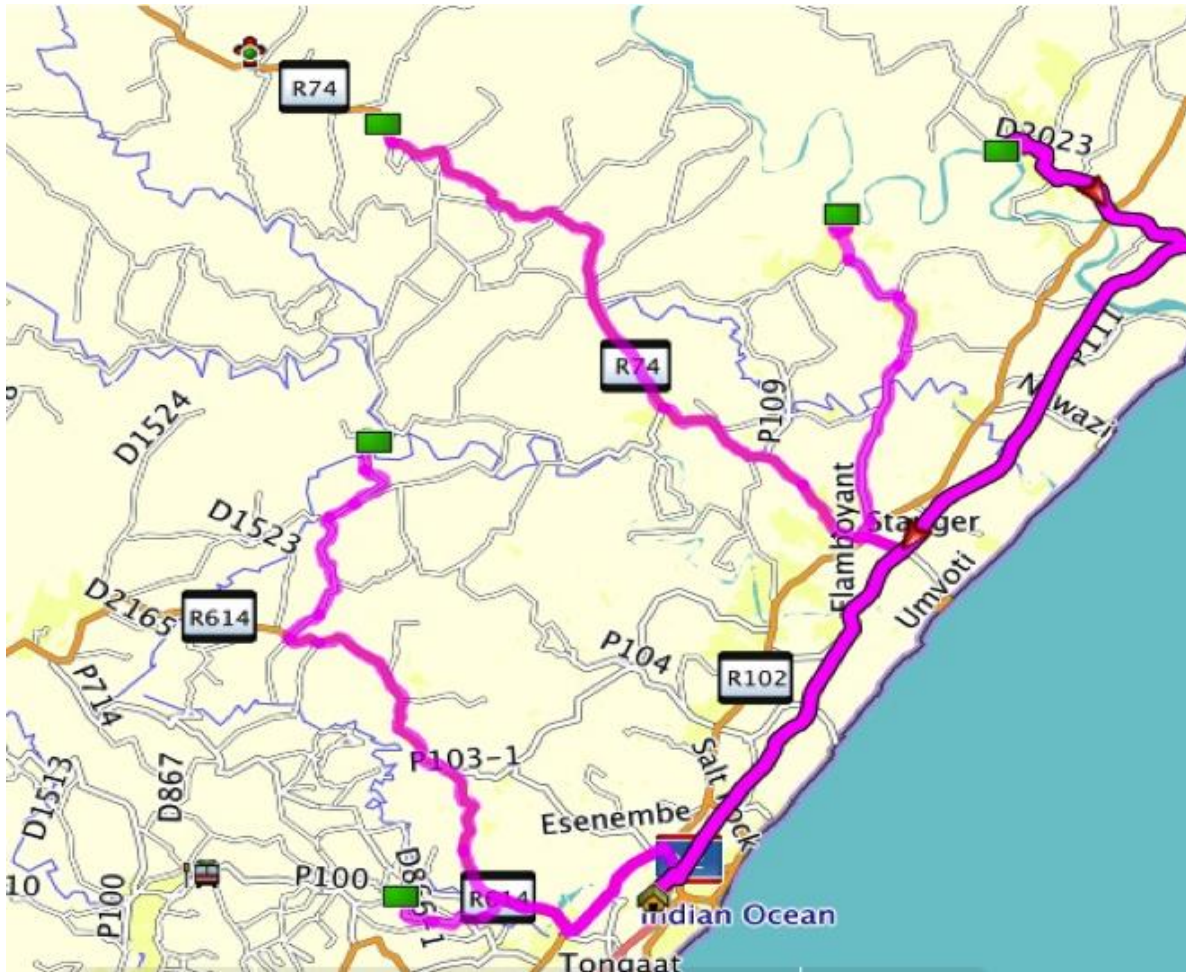
It is reported that generally there has been a decline over the years in the numbers of SME vegetable producers (Roy Nohari, *pers. comm.*) who is Chair of the Farmers Retail Market, located on the same site as the Durban Municipal Fresh Produce Market, reports that numbers have dropped from 1,500 in the early 1990s to only 150 today. These producers are spread along the coastal areas, north and south of Durban.

#### **d. Greenhouse projects**

The iLembe Greenhouse project consists of five sites spread across the District with the development of 2 x 2,500 m<sup>2</sup> hydroponic Greenhouses located on each site. A distribution map of the sites with the location of the ex-Romac and KwaSizaBantu packhouses as an illustration of the types of distances producers would have to deliver produce to if an existing and/or rehabilitated pack house was to be used is provided in Figure 6.

The five Greenhouse projects and their distances to the old Romac site are located at:

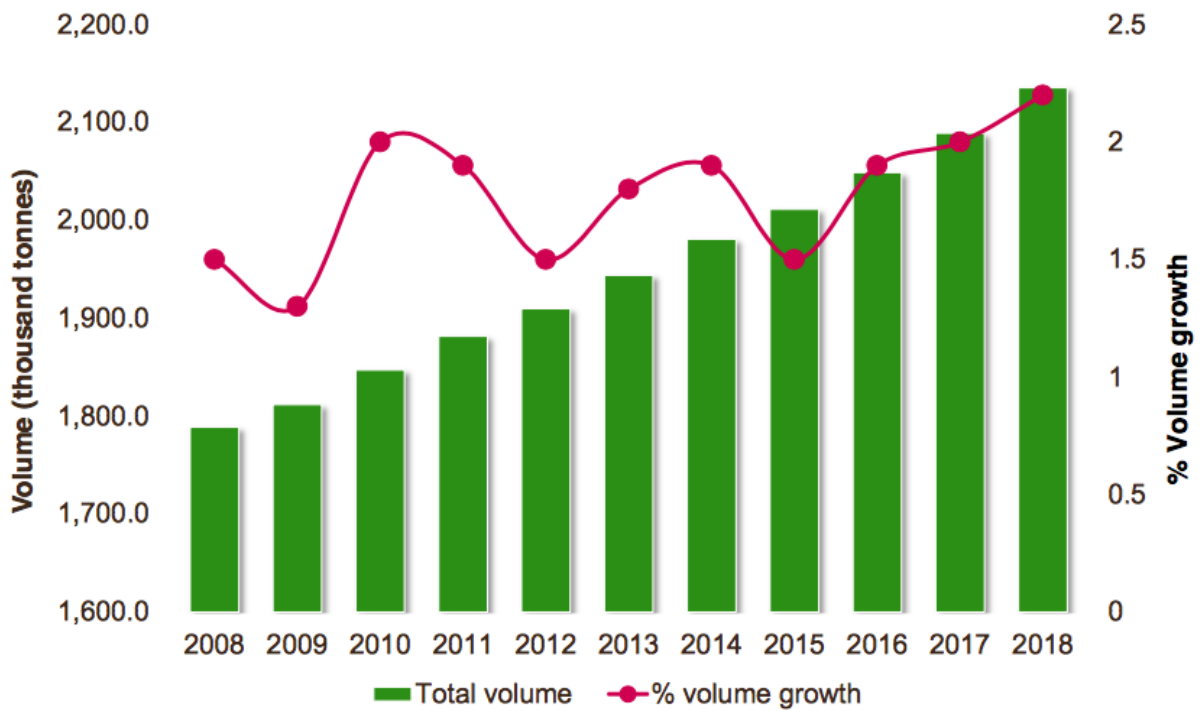
- Mathonsi Devine Greenhouses near Mandini, by road 64 km to Romac and 96 km to KwaSizaBantu
- Bulwer Farm Greenhouse, by road 54 km to Romac and 49 km to KwaSizaBantu
- Maphumulo Greenhouse, by road 70 km to Romac and 11 km to KwaSizaBantu
- Ndwedwe Greenhouse 2, by road 56 km to Romac and 37 km to KwaSizaBantu
- Ndwedwe Greenhouse 1, 23 km to Romac and 96 km to KwaSizaBantu



**Figure 39: Map showing location of the iLembe Greenhouses, KwaSizaBantu and the ex-Romac facility, with Logistic routes to Romac**

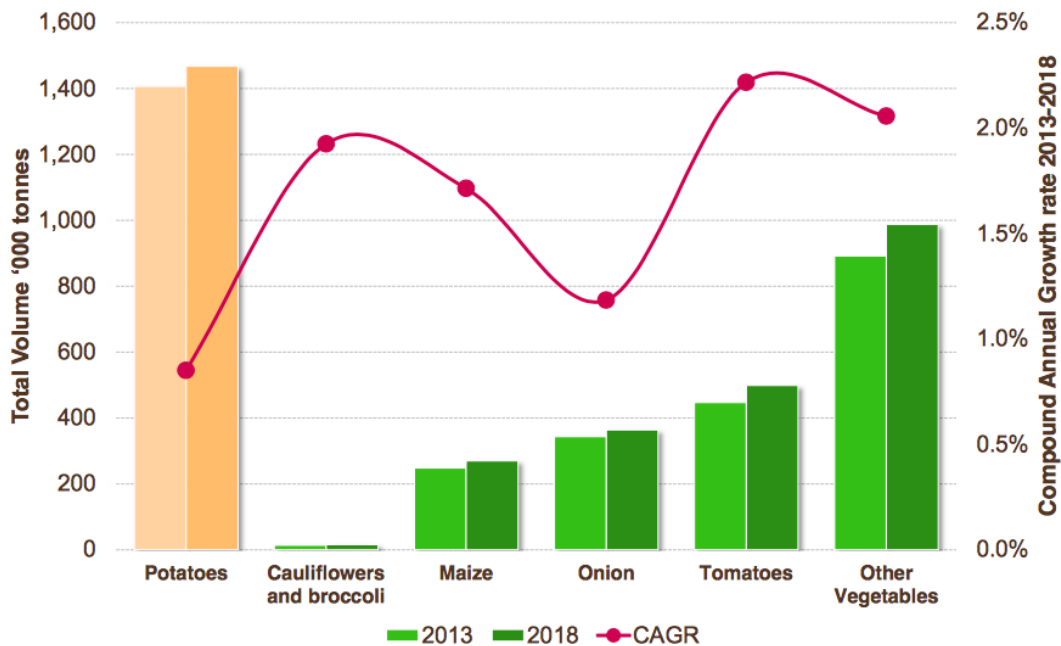
### 3.5. Demand conditions

The estimated annual vegetable demand in iLembe is 96,000 tons. Local production from smallholders is estimated at 9,473 tons. Research (Euromonitor, 2014) showed that in SA expenditure on fruit and vegetables fluctuates as per the graph below with some more permanent growth in vegetable expenditure whilst vegetable expenditure tracks food expenditure. In SA expenditure on food is circa 20% of household total expenditure (ibid). In terms of consumption this has grown from some 1.8 million tons in 2008 to an estimated 2.1 million tons in 2017 as per the graphic below.



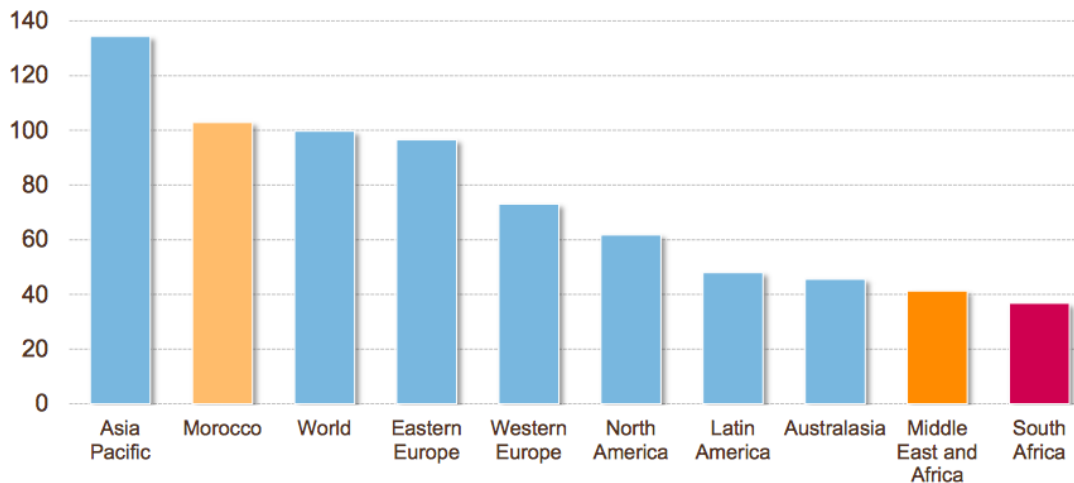
**Figure 40: Fresh Vegetables Volume Performance 2008-2018**

Disaggregated by main vegetable types indicated the dominance of potatoes and tomato as per the graphic.



**Figure 41: Disaggregated Fresh Vegetables Volume Performance**

South Africa lags the rest of the world in average consumption and South Africans on average eat less than 400g per day of vegetable servings, i.e. 146 kg per annum. Some 400g per day, which equals 5 servings, is considered the minimum by WHO for a healthy diet. 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 43.26 kg during 2015/16, approximately 8.4% lower than the 47.23 kg of 2014/15.



**Figure 42: Annual per capita vegetable consumption, 2013 (kg)**

This assumed average consumption applied to the iLembe population of 657,612 (iLembe IDP, 2016) translates to a consumption of some 96,000 tons per annum. Comparing this figure with the existing production capacity (table 4) of 9,473 tons per annum, it can be deduced that 90% of the local consumption is currently imported to iLembe and that an import substitution potential of almost 86,000 tons of vegetable the size of local demand for fresh produce.

In the short-run, the immediate unmet demand in the local market can be estimated based on the capacity of existing public procurement schemes and recent market shares of projects such as Romac. The school feeding scheme has an intake capacity of 64 tons per week which equals to 3328 tons per annum. Currently, Enterprise iLembe is supplying 38 tons per week or 1996 tons per annum. In addition, Romac used to supply 320 tons per annum of various vegetables to supermarkets in the region. Taking both cases into account, a local demand of 1650 tons per annum is in the immediate reach of local producers.

### 3.6. Fresh produce market channels

As per Zitholele there are several formal and informal market channels and the general flow of fresh produce is shown below. The channels identified are concentrated in the Durban CBD/Clairwood areas and in Pietermaritzburg. Zitholele found that no significant market channels north of eThekweni exist and concluded that most formal and informal traders in the municipalities north of eThekweni would either purchase from the Durban/PMB channels or

directly from farmers. The conclusion (ibid) was that the potential exists for a formal fresh produce market in iLembe. No such formalized market has been established yet.

The implication of Zitholele's findings for emerging growers is that market outlets will be difficult to access, a problem that persists to this day and one any SECO intervention, through an appropriate project design, would have to address to **link emerging SME farmers to a contract market**.

Smallholder farmers are reliant on either the local informal community as an outlet for surplus or on hawkers who collect at farm gate (the so-called "bakkie traders"<sup>5</sup>). These routes reportedly often do not yield attractive returns to smallholders, where they are often forced sellers, having to accept any cash price offered due to their precarious financial situation and the perishability of their product.

The north coast has several SME vegetable farmers of Indian origin who rely on selling through formal markets such as the Clairwood or Durban municipal markets or through niche channels they developed over many years. Reportedly (Mr. Roy Nohari, *pers. comm.*). It is notable that different channels require different quality standards, with retailers all requiring standards that guarantee food health standards and product traceability.

### 3.7. Pack Houses

Pack house operations can be categorised based on both the method of sourcing raw materials and on market/product specialisation. In terms of raw material sourcing there are two broadly distinctive vegetable pack houses; those that are erected by farming operations to pack own-produced vegetables and those that rely on bought-in produce, either from contracted growers or spot market purchases, either direct from farmers or from market agents.

In terms of market/product specialisation the two distinct types are those that specialise in a single crop (i.e. peppers, tomatoes, cucumbers etc.), usually supplying to a high-end retail customer such as Woolworths, Checkers etc. and those that offer a wider range of customers a full spectrum of vegetables, in the form of mixed salads and mixed vegetable packs.

The pack house operating at the Dube TradePort which was originally packing a range of vegetables for major retailers (vegetables being imported into the province) closed down and the banana growers in Mpumalanga and the South Coast are now using it as a ripening and packing facility.

Making a profit from a stand-alone pack house operation is not easy and most successful ones are usually on-farm as per the Nohari Farms pack house inland from Ballito, albeit modest in size at a capacity of about 45 tons per month on average.

An indicative gross profit assessment of an SME pack house processing about 50 tons per month is a turnover of circa R12 m at a GP margin of 55% with overheads of about R5 million, leaving R1.6 m for interest and other capital replacement costs. A requirement for smallholders, located across a range of growing conditions is to have a market outlet that offers an opportunity to sell a range of products and a range of quality specifications.

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<sup>5</sup> "Bakkie" is a local term to describe a 1-tonner LDV.

## 4 Summary of key issues related to Fruits and Vegetables Value Chain

When undertaking this research cognisance has been taken of the challenges that small and medium enterprises (SMEs) experience when participating in the South African (SA) food sector. This in turn influences the recommendations that flow from this study.

### **Key messages – Improved Small-scale Farmer access to fresh produce agri food markets in South Africa**

There have been extensive changes in Southern Africa's agro-food markets in terms of their structure and governance systems. Agribusiness change processes need to be set within a wider (development) context, to assist small scale farmers to respond successfully to changes experienced in the agro-food markets. Such assistance and support may come in the form of marketing, technology, finance, managerial and organisational development to enable them to engage with formal agri-business.

Successful inclusion of smallholder farmers into the mainstream agro-food markets requires a certain mix of organised farmers (collective action), receptive business, enabling public policy NGOs and civic society.

Policy makers need to understand the dynamics, given current policy, of the drivers of market restructuring (global, national, local) and their impact on smallholders as well as on the wider rural economy (poverty). Existing policies need to be realigned and/or new policies should be put in place to avert the marginalisation of small-scale farmers.

Small-scale farmers face many challenges to participate in the more formal sectors of the South African food economy and especially in fresh produce markets (*Source: Re-governing markets: Policy Brief January 2008, University of Pretoria*).

Trends internationally (Shepherd<sup>6</sup>, FAO) in the arena of smallholder farmer development and the fresh produce value chain point to:

- A change in consumption patterns from staples/ carbohydrate foods to meat, dairy products, fruits and vegetables; because of increased affluence, improved marketing chains, growing interest in value-added products and interest in organics and fair-trade.
- Processing is increasingly shifting to Multinational Corporations (MNCs) who may take over local processors.
- A growing interest in contract farming arrangements, where firms often provide seeds and other inputs and closely monitor production.
- An emergence of closer relationships between firms at different stages of production and marketing within the value chain to ensure consistency in supply of product of an acceptable quality, compliant with appropriate food safety standards.

This creates opportunities to link farmers to markets in innovative and sustainable ways, especially as the non-viable production push strategies leave farmers in situations of producing crops with no market. Market linkages have the advantage of developing long-term business relationships, which create increased income-earning opportunities for smallholders.

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<sup>6</sup> Andrew Sepherd, FAO. Presentation to a workshop on the role of NGOs in linking farmers to markets, Somerset West. NAMC, 2009



Linking farmers to markets sustainably is thus a key criterion for achieving successful smallholders. Organisations participating in developing and maintaining these links have critical roles (*ibid*), which are:

- Link willing suppliers with willing buyers;
- Assist farmers to organise into groups for economies of scale;
- Train farmers to understand markets, and how to supply market demand;
- Promote trust between companies, traders and farmers through positive experiences of achieving production and delivery of contracted and/or agreed volumes, product mix and quality.

A linkage model is a requirement for developing a business plan that addresses both the needs and challenges faced by emerging farmers, is sustainable and attractive to private investors. As per Prof Karaan<sup>7</sup> linkage model options for consideration are:

- Farmer to farmer;
- Farmer to processor;
- Farmer to customer;

Design elements which any model (Karaan – SUN, Terken – Cheatah Prapika, Stewart – Lima, Dr P J Masika – ARDI et al) must address, include:

- Identification and understanding of profitable markets as point of departure;
- Contract design and monitoring (Management of the associated transaction costs, which can be high);
- Subsidising bulky investments<sup>8</sup>;
- Removing information asymmetries;
- Checking on opportunistic behaviour
- Managing moral hazard and adverse selection (there are often risks of side-selling by smallholders);
- Quality enhancement;
- Distance from market and associated logistics;
- Value addition;
- Provision of support services (technology, inputs, finance, training, mechanisation etc.);
- Management of the cash cycle, with speedy payment;
- Building trust between partners in the value chain;
- Farmers to be prepared to invest their own resources.

Some key principles that flow from linkage strategies are:

- Be prepared to start small and build on success and experience;
- Integrate private sector into the enterprise model (refer text box on Dev Bhumi Cold Chain Ltd);

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<sup>7</sup> Prof A S M Karaan, SUN. Presentation to a workshop on the role of NGOs in linking farmers to markets, Somerset West. NAMC, 2009

<sup>8</sup> With a cautionary note (A Shepherd, 2009) that subsidies can have a negative impact on the developing sustainable business, through placing selected producers at an unfair advantage to the detriment of others, secondly direct client services can squeeze of existing commercial services. However, where there are significant market imperfections targeted subsidies with a sunset clause can be justified.

- Plan with farmers and not for them;
- Build trust by being open and approachable, developing lines of communications between role-players;
- Holding of regular training cycles, repeating the lessons to coincide with the production calendar;
- Grower commitment to agreed production plan and contract;
- Combat incentives for side-selling by buying at farm-gate, speedy payment, fair competitive prices, offer of access to inputs and training;

**Box 2: Case Study - Dev Bhumi Cold Chain Ltd**

This cold chain management company has been operating with farmers in India for 60-years. The company offers a yield improvement programme (YIP) to farmers, providing them improved rootstock and plants for improved yields.

Produce is purchased direct from farmers, with immediate payment through local village banks, transported in cold trucks to Strategic Distribution Centres (SDCs), located at the centre of the production area. The SDC prescribes and co-ordinates pre- and post-harvest practices, providing planting material with a buy-back guarantee, looks after the farmer needs for inputs, finance etc., makes co-operative arrangements for the transport of the goods from farm-gate to facility to wash, sort, grade, bulk store, package and re-distribution to Retail Distribution Centres (RDCs).

RDCs aggregate and consolidate stock and provide just-in-time (JIT) deliveries to individual retail stores. RDCs are in or near metros on national highways that provide easy transportation for fresh fruits or vegetables. RDCs have the capability to wash, sort and grade to ensure freshest fruit and vegetables arrive in retail stores; store the produce in cold storage, package in retail ready display packaging and palletise according to EuroCollo Module standards.

This report identified key challenges and issues faced by various actors within the horticulture value chain. However, attempts to support and stimulate SME vegetable production is not something new in the province of KwaZulu-Natal. In 2007 the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) commissioned a study into the vegetable sector which identified key issues and opportunities (EDTEA, 2007). This research while confirming the relevance of the EDTEA’s findings, it reemphasizes the importance of a holistic approach to development of the horticulture and the necessary long-term vision of any such support programme.

Input supply	Production	Logistics	Market access
<ul style="list-style-type: none"> <li>- High fertilizer costs</li> <li>- Limited extension services</li> </ul>	<ul style="list-style-type: none"> <li>- Access to finance</li> <li>- Technical skills</li> <li>- Limited scope for high-value-adding processing</li> <li>- Lack of skills for adopting quality standards</li> <li>- Lack of coordination between producers</li> <li>- Reliability of supply</li> <li>- Economy of scale</li> <li>- mechanization, maintenance and operation of tractors and equipment</li> <li>- Pest and disease control</li> </ul>	<ul style="list-style-type: none"> <li>- Transportation</li> <li>- Missing links in the supply chain</li> </ul>	<ul style="list-style-type: none"> <li>- Dominated by single channel marketing through major retailers</li> <li>- Highly perishable product with high quality standards by markets</li> <li>- Cost competitiveness due to scale of supply</li> </ul>

**Table 7 – Summary of challenges**

## 5 Opportunities for Development of Horticulture Value Chain

Separated into short, medium and longterm

As described above, various actors and linkages in the value chain require upgrading in order to enhance the production and market share of horticulture products from iLembe. The product groups that have the potential to be included in the Horticulture Development component are considered in two groups of products:

- i. **Staple vegetables** (i.e. Carrots, Chinese Cabbage, Potatoes, Cabbage, Tomato, Pumpkin and Beans)
- ii. **High value fruits** (i.e. Avocado or Macadamia)

Staple produce will be mostly directed to local market and indirect export through supermarkets; the high value produce such as avocado will be targeted for indirect export through supermarkets and direct export through export market agents (i.e. Hall and Sons).

### 5.1. Enterprise upgrading

Various groups of farmers, to different degrees require upgrading, in mainly two areas of skills and product quality. Given the diverse typology of farmers, there is a need for categorizing farmers based on skills development and quality upgrading needs. For each skills set, the most efficient and effective mode of delivery must be devised. Services could be delivered either directly through project resources or indirectly through support institutions. In order to ensure sustainability of results, priority should be given to deliver such services on commercial basis.

#### a. Skills upgrading

Different types of horticulture producers require different capacity building needs and skills development. For instance, the independent farms such as Qutom will benefit from business planning and marketing skills while smallholders need to acquire skills related to planning, producing and marketing fresh vegetables. Whereas standard trainings and skills upgrading services can be provided to more advanced farmers through established courses, more innovative approaches are required for emerging farmers. For instance, mentoring schemes whereby a more advanced farmer partners with group of emerging farmers (such as those sugar cane growers that could be assisted to diversify into horticulture) to train and mentor them in production, planning and marketing of their produce.

Nevertheless, in general the following skills development needs are identified which need to be addressed by the future project either directly or through partnering with specialized service providers. These include:

- Plant specific production techniques and process
- Selection and use of input supply
- Business planning and management skills
- Financial planning
- Marketing

- Training in mechanisation, maintenance and operation of tractors and equipment;
- Training on pest and disease control
- Training in various quality standards for target markets National and Global GAP, among others.

#### **b. Quality**

The dominance of market by retailers who require high level of health and safety standards, poses as a challenge for farmers. Even other market channels who may have less stringent requirements, still would maintain a certain level of standards that have to be met by producers. Therefore, ensuring adherence to health, safety and quality standards of production will be critical for accessing markets. To this end, there is evident need to build capacity of various farmers in GAP, HACCP and other relevant quality standards.

Beyond building capacity of farmers there is a need for coordinated and well planned control mechanism for collection, storage and logistics along the supply chain. Pack House and Product Consolidation Hubs (see point 5.3) should be responsible to perform such functions.

### **5.2. Strengthening horizontal linkages**

Lack of economy of scale is a problem for an individual farmer and even farming cooperatives that limit their capacity to purchase inputs at competitive prices and supply in large volumes to target markets. Therefore, formal and informal networks of farmers can help overcome the problem of scale. Supporting cooperatives to enhance their services to farmers and improving their capacity to execute various functions in relation to purchase of inputs or joint marketing on behalf of farmers can significantly increase possibility of farmers to reach beyond their individual capacity.

This problem is evident in iLembe and therefore building capacity of farmer networks and cooperatives will be instrumental in overcoming the problem of scale. Moreover, such networks must be capacitated to coordinate production and ensure quality and consistency of produce.

### **5.3. Establishing supply chain linkages**

The following key actors are expected to be playing a critical role in enhancing the supply relations from farm to market.

#### *i. Product Consolidation Hubs*

Smallholder's individual small production base and dispersed location is a challenge to reaching economies of scale. Consolidating viable volumes of product therefore would require a mechanism to aggregate product from various sources. The five iLembe Greenhouse sites could be used as Product Consolidation Hubs (PCHs) for smallholders located within a 20-km radius. The PCHs will be neutral consolidating hubs in that they would accept products from independent farmers, farming cooperatives of greenhouse farmers insofar as their product meets the expected criteria.

Given the high costs of inputs for smallholders buying individually the PCH should act as an input supply hub, sourcing inputs at competitive prices and in appropriate pack sizes. Given the need for fair prices the Pack House could operate on prices linked to municipal market benchmarks, which should be advertised at the PCH. The PCH can also act as a sale point for local hawkers, “Bakkie” trade and “boxed vegetables”. Farmers can supply either as individuals or under an association / co-operative entity.

#### *ii. Pack houses*

Accessing value-add markets is often beyond the reach of an individual smallholder. This value addition would be in the form of sorting, grading and packaging. To counter this, smallholders could be linked with an existing Pack House, which has existing capacity to add value and have access to such markets. Such market linkage should be further strengthened through necessary information and services provided to individual farmers. Smallholders will be required to produce according to a production supply template provided by the Pack House. To this end, a mentor organisation could be engaged to provide the necessary planning and co-ordination support.

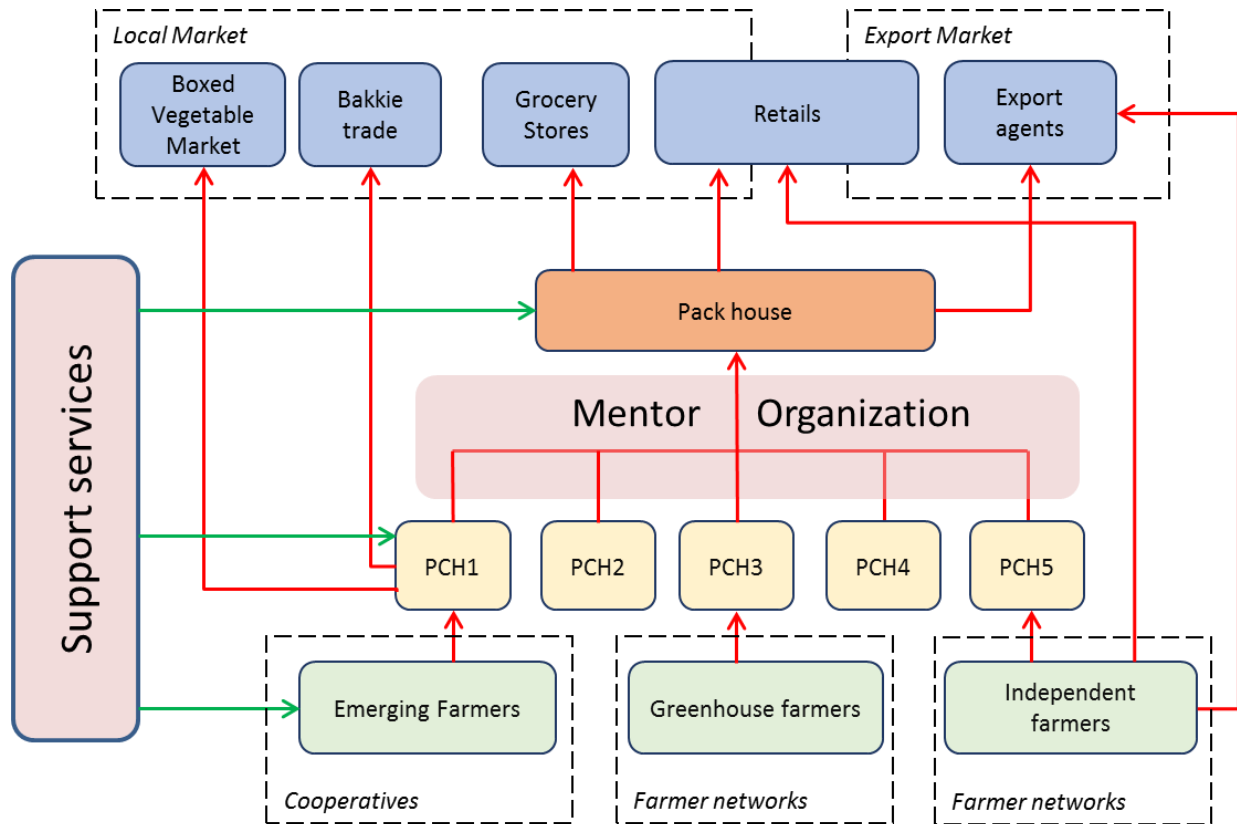
The Pack House should develop the retail market for high quality vegetables and supply mixed vegetable product to value add markets such as Retailers, Grocery Stores and any other market outlets demanding high quality pre-packed product.

#### *iii. Mentor organization*

In order for the PCH to perform its functions, an operator should be contracted who would ensure the coordination and planning between individual farmers, PCH and pack houses. A schematic of a possible organisational and institutional structure is provided below. Farmers within a 20 km radius of the Greenhouse (providing the location for a PCH) would deliver to the PCH recommended to be managed by a mentor organisation.

#### *iv. Export Agents*

Export agencies provide the missing link between the individual farmers and target export markets. Producers of fruits and vegetables like avocado that have an evident export potential often cannot reach the export market due to their limited resources that need to be invested in marketing and the high risk entailed in engaging in export. There are various organizations that provide this missing link such as Dev Bhumi Cold Chain Ltd. (see box 2) and Hall and Son (see box 1).



**Figure 43: Proposed Supply Relationships**

It would be imperative that such supply relations would be self-sustaining only if there's a strong business case for it. Moreover, along the supply chain there are various public and private actors who need to be engaged. This calls for a well-crafted and well-governed partnership framework between public and private sector.

#### 5.4. Provision of Support Services

Indicated service requirements for smallholders would include the following which will be provided by existing and capacitated service providers. Where such services do not exist, an institutional capacity building programme may have to be implemented to ensure availability and quality of such services. The priority will be to integrate such services within the portfolio of the existing service providers and support institutions. Identified service requirements are:

- Fertiliser and chemicals for those following a production system based on inorganic fertilisers and chemicals.
- Field layout and land preparation advice for organic production systems based on soil protection, water harvesting and conservation, composting and crop rotations (mainly targeted to export oriented producers).



- Production advice, which includes crop options, planting scheduling, agronomic practices of pest and weed control under either an organic (permaculture) production regime or with the use of inorganic fertilisers and chemicals.
- Business development advice and support.
- Initiation of self-help groups (SHGs), which can develop as savings clubs and ultimately a micro-credit system for further business development.
- Prices competitive with at least municipal market prices for sales to a pack house and prices close to retail prices for the boxed vegetable sector.

## 6 Conclusions

The project team has tried to estimate, within the limitations of the methodology employed, the number of small scale commercial vegetable farmers in iLembe. To achieve this we have relied on information obtain by way of opinions on this matter received during fieldwork from various respondents interviewed. It was not within the realm of practical possibility to conduct a census of vegetable and fruit producers, and therefore our estimates are presented in the table below.

Based on the assessment outlined in this report, interventions in support of growers of fruit and vegetables should be focused and concentrated on the small core of dispersed enterprises demonstrating high potential for successful movement into higher value added products and integration into horticultural value chains. The observed lack of scale effect and the absence of clustering is not necessarily a reason for non-engagement. Yes, the cost of supporting them would be above what it might have been were there more of them clustered either geographically or by product type, but it just may be the case that a focused intervention within a small number of relatively small-scale projects may in itself be methodologically more likely to stimulate the growth of the fledgling horticulture sector in iLembe. Not only would it also be easier to manage than a more extensive less specific support programme, but it may well prove to be the genesis of a nucleus of producers that in turn could reinforce further growth.

In the next stage, it is recommended that:

1. A specialist small farmer support organisation is commissioned to identify target products (among shortlisted in table 1) that could be produced at scale, meet local and export value chain requirements (the latter refer to avocado), and engage in a focused, geographically concentrated project. This task should be done in collaboration with interested market actors such as super markets or export agents.
2. Develop Terms of Reference for engagement of various actors as subcontractors or partners along the supply chain including Mentor Organizations, Pack Houses, Retailers and Supermarkets and Export Agents (Lead Firms)
3. Call for expression of interest to engage various actors and to jointly identify the key buyer/market requirements in terms of QCD (quality, cost and delivery) and establish the criteria for selection of farmers who meet the minimum QCD requirements.
4. Mapping of the potential farmers and selection of target farmer groups in cooperation with Lead Firms
5. Develop terms of reference and facilitate partnership between buyers and farmer for supply of fresh produce (target crops).
6. Survey of selected farms, assessment of the upgrading needs (skills and quality), categorize farmers based on their skills level Identifying training and capacity building needs and establish baseline for monitoring and evaluation.





7. Identify support institutions and service providers (financial and non-financial) for implementation of capacity building needs and facilitate contracts for delivery of services
8. Design a detailed skills development programme including identification of key support institutions and BDS providers (i.e. TVET, FET or extension services) that are best suited to partner for delivery of the skills development programme

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iLembe IDP, 2016

## Annex A - Supply Side Research Plan

### Initiation

During this phase confirmation of the sectors for evaluation must be determined based on existing activities within the two districts and on the opportunities. The study parameters that need to be confirmed indicate:

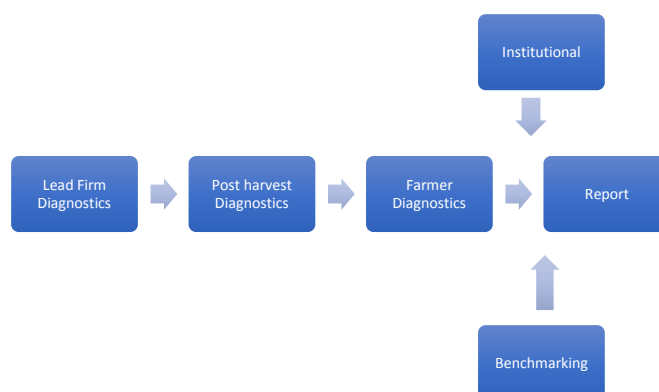
- a) Renewable energy with a focus on bio-gasification and biofuel potential
- b) Sugar value chain
- c) Wood value chain and furniture manufacturing
- d) Horticulture
  - a. Vegetables
  - b. Macadamia
  - c. Fruit
  - d. Flowers
  - e. Moringa

An understanding of the institutional roles (i.e. the iLembe Development Agency v the District Municipality) and appropriate project contacts is required.

### Identification of target Farmers and SMEs to Interview

The iLembe District Municipality is the target region and specifically the **KwaDukuza** and **Mandeni** Local municipalities **but** with some latitude to venture into other Local Municipal Districts.

The VCE will be consulted on the outcomes of the outcomes of the lead firm diagnostics to determine what typology of farmer should be consulted and the design of the farmer questionnaire.



## Annex B - Questionnaire design

### Objective

To analyze farm productivity and the critical issues that have a bearing on farm level productivity and farmer capabilities. This should help to identify critical points at the farm level which need to be addressed to make significant productivity and product quality gains.

For each group of suppliers, the general characteristics will be provided to determine the specific constraints per group and to assess the support required to improve productivity and product quality for that group.

The approach was to gather information from key respondents in the sectors on an open-ended questionnaire technique asked along the following subject areas, with an outline of questions as appropriate to the respondent.

### Supplier/ Farmer Diagnostics

- Land and demographic information
- Farm infrastructure
- Agriculture practices
- Input supply
- Finance
- Information supply
- Farm management

### Benchmarking

- Farm level productivity
- Post-harvest supply chain productivity

Issues	Questions
Land and demographic information	How much agricultural land does supplier/farmer own? (Give details)
	Detailed breakup of supplier/farmer production data.
	What is the family size and Who all in the family work on the farm?
	Does supplier/farmer hire farm laborers? (How many, how often, and for what specific functions?)
	What is the education level of the supplier/farmer? Can they read and write? If not, are there other family members residing with the farmer who can read and write?
Agriculture practices	Who taught the supplier/farmer the agriculture practices that they currently follow?
	Are the supplier/farmer neighbor's agriculture practices different than theirs? If so, provide details?
	What is their biggest source of influence in information gathering and decision making

Issues	Questions
	<p>regarding agriculture practices?</p> <p>In past 3 years, has the supplier/farmer learned new agriculture practices from any sources? If so, please provide details (The sources as well as the practices and their adoption or non-adoption of it)</p> <p>Is supplier/farmer aware of the good agriculture practices for the crops/cattle they grow?</p> <p>Does the supplier/farmer follow all the good practices? If not, why not? What constraints them from adopting those practices?</p> <p>What incentives would help the supplier/farmer adopt those practices?</p>
Farm infrastructure	<p>Have they undertaken any major land improvement activities in the past five years? (provide details)</p> <p>Do they use electricity for farming purpose? (Provide details). Do they get consistent electricity supply? What are the major issues with electricity supply?</p> <p>What is the current level of farm mechanization? What kind of machinery/tools do they use and for what activities? Do they own these machines/tools? Do they rent or lease these machines/tools? (Provide details)</p> <p>Did the use of these tools/machines led to increased farm productivity and farming efficiency? If so, please explain the causal link.</p> <p>Do they have access to all the tools and machines they need? If not, what are additional tools/machines that they need but are currently not available?</p> <p>Is the current level of their farm infrastructure sufficient to meet their needs? If not, what additional infrastructure/ upgrading they would like to do on their land and why? What constraints them from making those upgrading decisions?</p> <p>Are there any laws/ regulations which constraints them from making farm level investments?</p>
Irrigation	<p>How much of their land is irrigated?</p> <p>What are their current irrigation systems/practices? Do they use drip irrigation? Sprinklers?</p>
Input supply	<p>What kind of farm inputs do they use? (Provide details)</p> <p>What are the major sources of farm input supply? (If they prefer some institutional channel over others for specific inputs, please provide details)</p> <p>Are there any laws/ regulations which constraints them from getting access to the farm inputs?</p>

Issues	Questions
Seed / seedlings / Seedcane / trees /	Where do they procure the seeds from?
	Do they directly plant the seeds? Do they use seeding or sapling? Do they have access to nursery?
	Are these GM (genetically modified) or hybrid seeds? Do they chemically treat these seeds before using them?
	Do they get the seeds as per their desired quality, quantity, time and price? If not, what are the constraints and issues surrounding them?
Finance	Have they accessed credit for productive investment in their farm in the past five years? (provide details)
	What are the various institutional options for accessing finance? Which are the preferred source/s and why? (Buyer finance / supplier finance/ bank finance/ MFI/ money lender etc)
	What are the main constraints in accessing finance?
	Are they planning to avail some credit for farming purpose in immediate future? If yes, provide details.
	How do they pay for inputs? (Cash or credit)
	If they get some short term working capital loan, how would they invest it?
	If they get some long-term investment loan, how would they invest it?
Fertility management	Do they engage in soil fertility management practices? If so, please elaborate.
	Do they use fertilizers? What kind? How do they determine what dozes of fertilizers to apply and when? Do they keep a record of their fertilizer application schedule?
	Do they combine irrigation schedule with fertilizer application schedule?
	Do they get the fertilizer as per their desired quality, quantity, time and price? If not, what are the constraints and issues surrounding them?
	Do they get optimum productivity from their fertilizer application? Has their yield saturated in past few years and despite increased addition of fertilizer, the yield remains stagnant?
Plant protection	Do they follow integrated pest management or organic plant protection techniques? If yes, provide details.
	Do they use pesticides and insecticides? What kind? How do they determine what dozes to apply and when?
	Do they get the insecticide and pesticide as per their desired quality, quantity, time and

Issues	Questions
	<p>price? If not, what are the constraints and issues surrounding them?</p> <p>Are their plant protection techniques effective? How much of their crop was damaged because of pest and disease infestation?</p>
Information supply	<p>How do they determine what to produce on their farms? What are their sources of information regarding projected demand of various produce?</p> <p>Do they get information about the prices of various farm produce in advance? From what sources? How does it influence their selling decisions?</p> <p>Do they get access to information about weather in advance? From what sources? How reliable is the information? Do they make decisions based on the weather update? (provide details)</p> <p>Do they get access to information about pest and disease outbreak in advance? From what sources? How reliable is the information? Do they make decisions based on these updates? (provide details)</p> <p>Do they get any agriculture advice/ agriculture extension support from any institution? Provide details. Which one of them is more relevant and trustworthy source of advice? How often do they avail these services? What are the critical constraints/ issue surrounding access to agriculture extension services?</p> <p>How do they determine what to produce on their farms? What are their sources of information regarding projected demand of various produce?</p>
Market access	<p>Where do they sell their farm produce? Do they prefer some market channels over others? Why?</p> <p>How do they determine which markets to sell what produce and at what time? What are their sources of information regarding markets?</p> <p>Is there a quality differentiation for their produce in their end markets? Do they get higher price for better quality produce? How is quality determined? (parameters for quality and price determination)</p>
Farm management	<p>Do they use any record keeping systems? Do they keep track of sales and purchase? How?</p> <p>Do they follow basic health and hygiene practices on their farm? Provide details.</p> <p>Who make decisions? Who control access to input, crop, tools, machines, etc.</p> <p>Do they lose any produce after harvest because of poor handling, wastage, and storage? If so, what percentage of their gross production?</p>

## Annex C - iLembe (KwaDukuza and Mandeni) Agricultural Potential

The DARD Bioresource Unit (BRU) programme enables an estimate to be made of the agricultural resource potential of the district. The BRU numbers below associated with the accompanying map indicate the range of crop types that are suited to the climate and soils.

**Table 1: iLembe District Agricultural Resource Potential - Bio Resource Units**

BRU No.	Climate	Soil	Topography	Fruit, Vegetable & herb potential
Ya14	C1: Local climate is favourable for good yields for a wide range of adapted crops throughout the year.	30.6% of the BRU is arable. 19.4% of the arable land is high potential. Soils of moderate to poor drainage occupy 66.9%.	Mainly rolling and partly broken with generally steep and some moderate slopes.	Banana / Cabbage / Carrot / Dry Bean / Potato / Tomato / Irrigated groundnuts / Maize / sorghum / soya bean / sugar cane / Eucalypt / Pinus Elliotti
Ya3	C1: Local climate is favourable for good yields for a wide range of adapted crops throughout the year.	28.9% of the BRU is arable. 18.7% of the arable land is high potential. Soils of moderate to poor drainage occupy 72.9%.	Mainly broken and partly rolling with generally steep slopes.	Banana / Cabbage / Carrot / Dry Bean / Potato / Tomato / Irrigated groundnuts / Maize / sorghum / soya bean / sugar cane / Eucalypt / Pinus Elliotti
Ta2	C7: Severely restricted choice of crops due to heat, cold and/or moisture stress	20.6% of the BRU is arable. 51.1% of the arable land is high potential. Soils of moderate to poor drainage occupy 55.3%.	Mainly broken and partly valley with generally steep and some moderate slopes.	Cabbage / Carrot / tomato / Groundnut – irrigated / Lucerne irrigated / Maize / Potato / Sorghum / Soya / Sugarcane / Sunflower
Za5	C1: Local climate is favourable for good yields for a wide range of adapted crops throughout the year.	Sandy soil makes up 94.9% of the area. Soils of moderate to poor drainage occupy 37.2%.	Mainly rolling with generally moderate and some gentle slopes.	Banana / Cabbage / Carrots / Cotton / Dry Bean / Paprika / Potato / Tomatoes / Eucalypt / Pinus Elliottii / Pinus Taeda / Soya / Sugarcane
Ya4	C1: Local climate is favourable for good yields for a wide range of adapted crops throughout the year.	21.6% of the BRU is arable. 38.3% of the arable land is high potential. Soils of moderate to poor drainage occupy 84.0%.	Mainly rolling with generally moderate and some gentle slopes.	Banana / Cabbage / Carrots / Potato / Tomatoes / Cotton / Soya / Sugarcane /
Xb8	C2: Local climate is favourable for a wide range	52.6% of the BRU is arable. 0.1% of the arable land is	Mainly broken with	Cabbage / Carrots / Potatoes / Tomato /



BRU No.	Climate	Soil	Topography	Fruit, Vegetable & herb potential
	of adapted crops and a year round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	high potential. Soils of moderate to poor drainage occupy 45.7%.	generally steep slope.	Dry Bean / Lucerne – irrigated / Maize / Sugarcane / Sorghum / Soya / Pinus Elliottii
Xb10	C2: Local climate is favourable for a wide range of adapted crops and a year round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	52.3% of the BRU is arable. 0.3% of the arable land is high potential. Soils of moderate to poor drainage occupy 46.6%.	Mainly broken with generally steep slopes.	Cabbage / Carrot / Potatoes / Tomatoes / Dry Bean / Lucerne – Irrigated / Maize / Sorghum / Sugarcane / Pinus Elliottii
VWa6	C4: Moderately restricted growing season due to low temperatures and severe frost. Good yield potential for a moderate range of adapted crops but planting date options more limited than C3.	14.2% of the BRU is arable. 3.2% of the arable land is high potential. Soils of moderate to poor drainage occupy 65.5%.		Bananas / Cabbage / Carrots / Cowpeas / Dry Bean / Groundnut / Potatoes / Tomatoes / Lucerne – irrigated / Sorghum / Soya / Sugarcane
Yb13	C2: Local climate is favourable for a wide range of adapted crops and a year round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	49.9% of the BRU is arable. 12.3% of the arable land is high potential. Soils of moderate to poor drainage occupy 46.7%.	Mainly broken with generally steep slopes.	Cabbage / Carrots / Potatoes / Tomatoes / Dry Bean / Lucerne – irrigated / Maize / Sorghum / Sugarcane / Soya / Eucalyptus / Pinus Elliottii
UVa6	C2: Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	48.9% of the BRU is arable. 19.4% of the arable land is high potential. Soils of moderate to poor drainage occupy 45.6%.	Mainly broken and partly valley with generally steep slopes.	Bananas - irrigated / Cabbage / Carrots / Potatoes / Tomatoes / Dry Beans / Lucerne – irrigated / Maize / Sorghum / Soya / Sugarcane / Pinus Elliottii
Ua2	C5: Moderately restricted growing season due to low temperatures, frost and/or moisture stress. Suitable crops may be grown at risk of some yield loss.	22.6% of the BRU is arable. 47.6% of the arable land is high potential. Soils of moderate to poor drainage occupy 61.2%.	Mainly valley and partly broken with generally steep and some moderate slopes.	Banana – irrigated / Cabbage / Carrots / Paprika / Potatoes / Tomatoes / Dry Bean / Groundnut / Lucerne – irrigated / Sorghum / Soya / Sugarcane /

BRU No.	Climate	Soil	Topography	Fruit, Vegetable & herb potential
				Sunflower
Wb19	C2: Local climate is favourable for a wide range of adapted crops and a year round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	52.2% of the BRU is arable. 4.4% of the arable land is high potential. Soils of moderate to poor drainage occupy 45.8%.	Mainly broken with generally steep slopes.	Cabbage / Carrots / Cowpeas / Potatoes / Tomatoes / Lucerne – irrigated / Maize / Sorghum / Soya / Sugarcane
VWa5	C4: Moderately restricted growing season due to low temperatures and severe frost. Good yield potential for a moderate range of adapted crops but planting date options more limited than C3.	66.5% of the BRU is arable. 11.1% of the arable land is high potential. Soils of moderate to poor drainage occupy 32.2%.	Mainly broken with generally steep slopes	Banana – irrigated / Cabbage / Carrots / Potatoes / Tomatoes / Cowpeas / Dry Bean / Lucerne – irrigated / Maize / Sorghum / Soya / Sugarcane / Sunflower
Yb18	C2: Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	82.8% of the BRU is arable. 61.0% of the arable land is high potential. Soils of moderate to poor drainage occupy 14.0%.	Mainly rolling and partly broken with generally steep slopes.	Bananas – irrigated / Carrots / Chinese Cabbage / Lavendar / Mint / Paprika / Pumpkin / Tomatoes / Potatoes / Dry Bean / Eucalypt / Pinus Elliottii / Pinus Taeda / Maize / Oats / Soya
Wa6	C2: Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	46.4% of the BRU is arable. 10.6% of the arable land is high potential. Soils of moderate to poor drainage occupy 48.7%.		Banana – irrigated / Cabbage / Carrots / Tomatoes / Dry Bean / Lucerne – irrigated / Sorghum / Sugar cane / Soya
VWb7	C2: Local climate is favourable for a wide range of adapted crops and a year round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	17.7% of the BRU is arable. 12.2% of the arable land is high potential. Soils of moderate to poor drainage occupy 60.9%.	Mainly broken with generally steep slopes.	Cabbage / Carrots / Potatoes / Tomatoes / Groundnut / Lucerne – irrigated / Maize
Xa1	C2: Local climate is favourable for a wide range	58.1% of the BRU is arable. 4.1% of the arable land is	Mainly rolling and partly broken with generally steep	Banana – irrigated / Cabbage / Carrots /

BRU No.	Climate	Soil	Topography	Fruit, Vegetable & herb potential
	of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	high potential. Soils of moderate to poor drainage occupy 37.6%.	slopes.	Potatoes / Tomatoes / Dry Bean / Lucerne – irrigated / Maize / Sorghum / Soya / Sugar cane / Pinus Elliottii
Wa9	C2: Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	44.1% of the BRU is arable. 57.3% of the arable land is high potential. Soils of moderate to poor drainage occupy 47.0%.	Mainly broken and partly rolling with generally steep slopes.	Banana – irrigated / Basil / Cabbage / Carrots / Paprika / Potatoes / Pumpkin / Tomatoes / Sorghum / Soya / Maize / Lucerne – irrigated / Sugar cane
Yb17	C2: Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	92.8% of the BRU is arable. 14.3% of the arable land is high potential. Soils of moderate to poor drainage occupy 10.7%.	Generally steep and some are moderate.	Banana – irrigated / Cabbage / Carrots / Beans / Potato / Dry Bean / Tomatoes / Maize / Sorghum / Pinus Elliottii / Sugar cane
Yb16	C2: Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	Soils of moderate to poor drainage occupy 100%.	Slopes are generally moderate and some are steep	Cabbage / Carrot / Potato / Tomato / Dry Bean / Eucalypt / Lucerne – Irrigated / Maize / Pinus Elliottii / Sorghum / Soya / Sugar Cane
Za12	C3: Slightly restricted growing season due to the occurrence of low temperatures and frost. Good yield potential for a moderate range of adapted crops.	Soils of moderate to poor drainage occupy 100%.	The terrain is mainly rolling and partly broken with generally steep slopes.	n/a
Zb4	C2: Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative	77.7% of the BRU is arable. 37.2% of the arable land is high potential. Soils of moderate to poor drainage occupy 13.3%.	Mainly rolling with generally steep slopes.	Banana – irrigated / Cabbage / Carrots / Potatoes / Tomatoes / Basil / Lavendar / Mint / Paprika / Pumpkin /



BRU No.	Climate	Soil	Topography	Fruit, Vegetable & herb potential
	to C1.			
Zb3	C2: Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.	82.2% of the BRU is arable. 23.3% of the arable land is high potential. Soils of moderate to poor drainage occupy 16.7%.	Mainly rolling with generally steep slopes.	Banana – Irrigated / Cabbage / Carrots / Beans / Potatoes / Tomatoes / Basil / Lavender / Paprika / Eucalypt / Lucerne – Irrigated / Maize / Pinus Elliottii / Pinus Taeda / Soya / Sugar cane / Sorghum



## Annex D - List of Interviews

No.	Name	Organisation	Tel	email
1.	Cheryl Peters	Enterprise iLembe	082 055 2010	<a href="mailto:cheryl@enterpriseilembe.co.za">cheryl@enterpriseilembe.co.za</a>
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8.	Charles Wilson	Owner SuperSpar (Salt Rock)	032 525 8030	
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11.	Radeshni Govender	ROMAC Farms – Lessee at the time of interview	076 465 6626	<a href="mailto:v.v.veg2@gmail.com">v.v.veg2@gmail.com</a>
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No.	Name	Organisation	Tel	email
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No.	Name	Organisation	Tel	email
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72.	Gerard von Egmond	Managing Director: Vegmoflora	083 679 4121	
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