

# A PROFILE OF THE SOUTH AFRICAN MANGO MARKET VALUE CHAIN

2020



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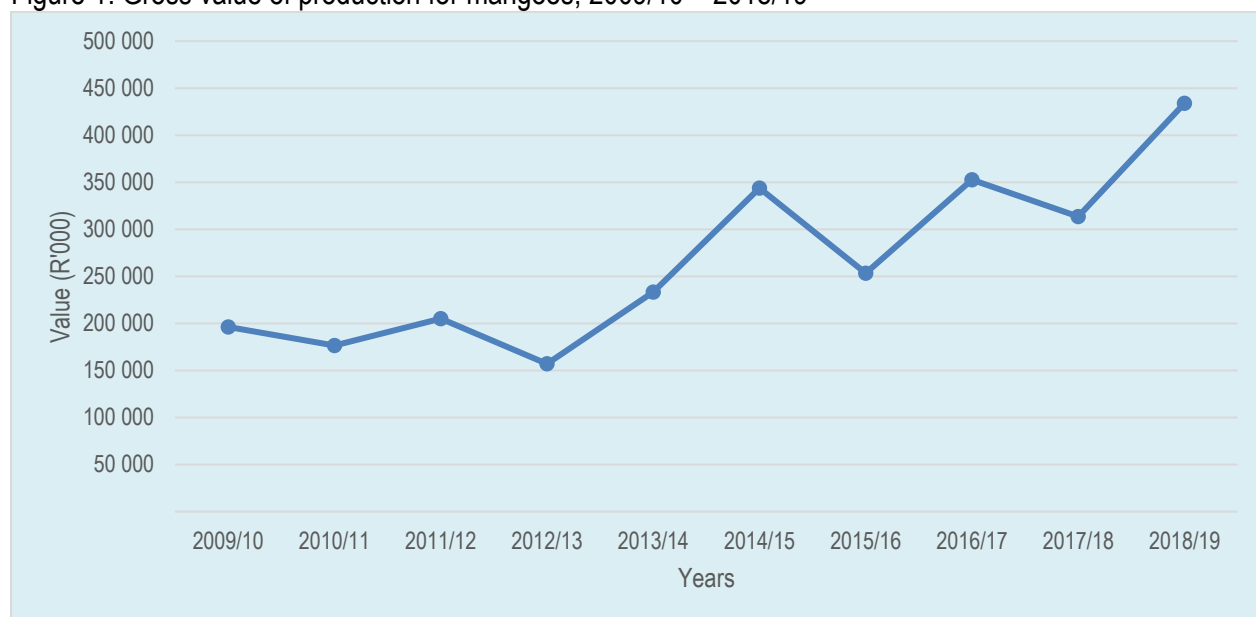
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## 1. DESCRIPTION OF THE PRODUCT AND INDUSTRY

The mango fruit belongs to the family Anacardiaceae in the genus *Mangifera*. The family consists of 41 species of which the mango (*Mangifera indica*) is the most important. It is a tropical fruit that also grows well in subtropical areas hence its classification in South Africa and other countries as a subtropical fruit. During the 2018/19 marketing season the total gross value of subtropical fruits in South Africa was R4.2 billion. In the same period the total gross value of mangos was R0.43 billion, representing 10% of the total gross value of South Africa subtropical fruits. The total gross value of production (GVP) for mangos over the last ten years is presented in Figure 1.

Figure 1: Gross value of production for mangoes, 2009/10 – 2018/19



Source: Statistics and Economic Analysis, DAFF

It can be observed from Figure 1 that the total gross value of mangos fell by 23% between the 2011/12 and 2012/13 marketing seasons before rising by 119% between 2012/13 and 2014/15. The gross value of production has remained relatively unstable during the first part ten years under review. Between 2017/18 and 2018/19 seasons, gross value of mangos increased from R0.3 billion to R0.4 billion. This can be attributed to the increased net realisation of mangos particularly from the local markets (see Figure 4) during the same period.

### 1.1 Mango production areas

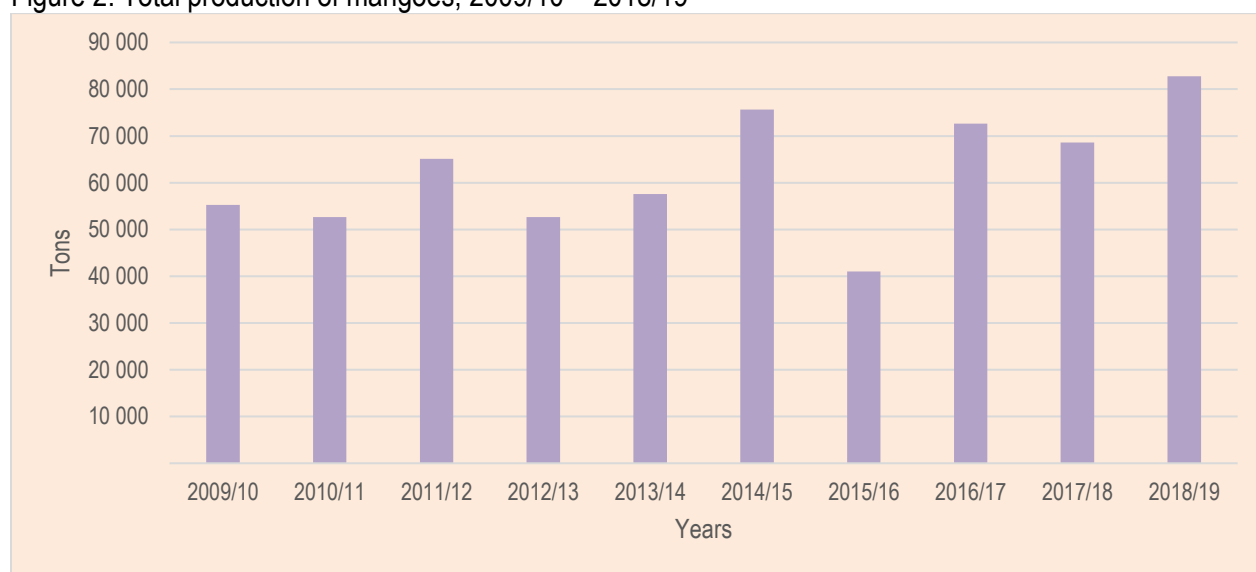
South Africa's mango production regions are mainly situated in the North Eastern part of the country. The elevation of mango growing areas varies from 300 to 950 meters above sea level with annual rainfall in the major growing areas varying from 300 to 1000 mm. Flowering during winter (June to August) is normally intense, which indicates that winter conditions are adequately conducive for flowering. Differences in average temperatures between the major mango growing regions give rise to differences in harvesting dates. Fruits produced in the higher lying areas are harvested later than fruit produced in the lower lying areas. The total production area for mango in 2019 was 7 000 hectares. Most of the mango plantings are in Limpopo found in the Soutpansberg, Northern, Central and Southern Letaba as well as Hoedspruit regions. The second

largest producer of mangos in South Africa is Mpumalanga province. Most of other mango plantings are in Mpumalanga are found in Onderberg areas of Malelane and Komatipoort. Kwazulu Natal.

## 1.2 Mango production

The total volumes of production for mangos during the past ten years are presented in Figure 2. It can be seen from the figure below that mango production has been unstable and relatively declining over the period under review. A total volume of 82 747 tons of mangos was produced in South Africa during the 2018/19 production season. This represented a 21% increase from the 2017/18 volume of 68 633 tons. The highest volume produced during the last decade was 82 747 tons in the 2018/19 season. Considering data for the past decade, the 2014/15 and 2018/19 seasons experienced bumper crops. There was a 46% drop in quantities produced between 2014/15 and 2015/16 production seasons.

Figure 2: Total production of mangoes, 2009/10 – 2018/19



Source: Statistics and Economic Analysis, DAFF, FruitSA

## 1.3 Cultivars

The most important mango cultivars grown in South Africa are Tommy Atkins, Sensation, Kent, Heidi, Keitt and Zill. Approximately 84% is planted under micro, drip, sprinkler or flood irrigation. Dry land production is no longer favoured unless the annual rainfall supplements the irrigation programme during critical periods. In the mango industry approximately 20% of the producers produce approximately 80% of the total annual production. Data on the total hectares planted to specific cultivars is currently not readily available from the industry but the cultivars discussed below are believed to be the main cultivars planted in South Africa.

**'Tommy Atkins'** is an oblong-oval cultivar with medium to large; skin thick, orange-yellow, largely overlaid with bright to dark-red and heavy purplish bloom, and dotted with many large, yellow-green lenticels. It has got a flesh medium to dark-yellow, firm, juicy, with medium fibre, of fair to good quality. It develops a poor flavour when it is over-fertilized and irrigated. It can be picked early; it develops a good colour and usually has long shelf-life. Sometimes there is an open space in the flesh at the stem-end. Interior softening near the seed occurs in some years.

'Sensation' is an oval cultivar with, oblique, and faintly beaked; medium to medium-small; skin thin, adherent; basically yellow to yellow-orange overlaid with dark plum-red, and with tiny, pale-yellow lenticels. It has got a flesh pale-yellow, firm, with very little fibre, faintly aromatic, of mild and has slightly sweet flavour.

'Kent' is an ovate cultivar with thick; large; skin greenish-yellow with dark-red blush and gray bloom; many small, yellow lenticels. It has a flesh fibreless, juicy, sweet; very good to excellent taste. Its tree is of erect, slender habit, of moderate size, precocious; bears very well and fruit ships well, but, for the market, needs ethylene treatment to enrich colour.

'Keitt' is a rounded-oval to ovate cultivar with a large; skin medium-thick, yellow with light-red blush and a lavender bloom. It has many lenticels, small and yellow to red. Its flesh is orange-yellow, firm, fibreless except near the seed; of rich, sweet flavour; very good quality. It has a small or medium to large seed. Its tree is small to medium, erect, open, rather scraggly but very productive. For market acceptance, it requires a post-harvest ethylene treatment to enhance colour.

## 1.4 Employment

The industry makes an important contribution to direct employment in the mango production and processing. It provides indirect employment for numerous support industries in the areas where mangos are grown. Direct employment within the industry during 2019 was estimated at 13 650 with approximately 54 600 dependents.

The prescribed minimum wage is used as a baseline for determining basic wages in accordance with the legislation governing conditions of service. Minimum wages for farm workers for the period 1 March 2021 to 1 February 2022 are presented in Table 1. The consumer price index (CPI) is used in the calculation of annual wage adjustments. The sectoral determination stipulates that the wage increase will be determined by utilizing the previous year's minimum wage plus CPI + 1.5%.

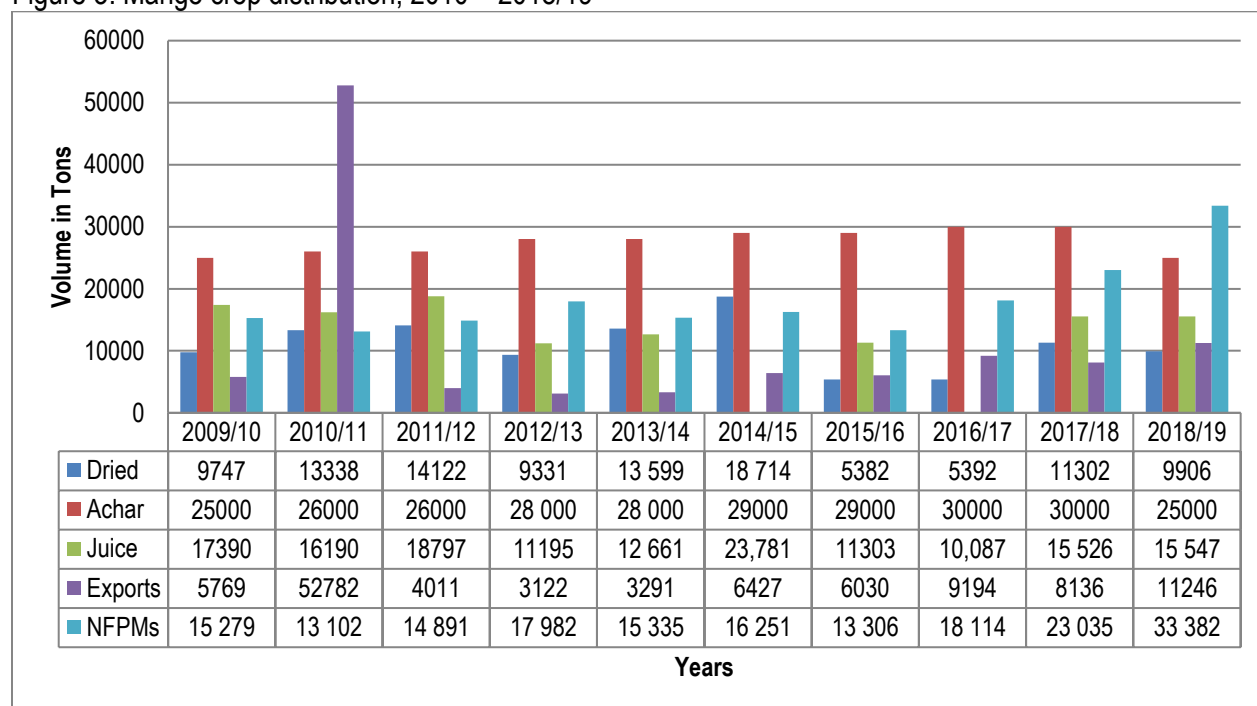
The minimum Wage Act 9 of 2019 came into effect in January 2019. The Act applies to all workers and their employers, except members of the South African National Defence Force, the National Intelligence Agency, the South African Secret Service, and volunteers who perform work for another person without remuneration. Under this Act, farm workers are entitled to a minimum wage of R18.68 per hour. The Act establishes the National Minimum Wage Commission, which is task to review the national minimum wage make recommendations to the minister on any adjustment of the national minimum wage.

## 2. MARKET STRUCTURE

The annual distribution of the mango crop is presented in Figure 3. The annual crop is processed into dried mangos, achar and juice and sold fresh through the national fresh produce markets (NFPMs) and as well as exports. The NFPMs accounted for a large proportion (33 382 tons) of the mango production in 2019. The volumes to the NFPMs increased by 45% between 2017/18 and 2018/19. A total volume of 9 906 tons of mangos was processed into dried during the 2018/19 marketing season. This was down from 11 302 tons processed into dried the previous year (2017/18). Another important distribution channel for mangos during the 2018/19 marketing season was the achar processing market. A total of 25 000 tons of mangos were sold through the mango achar processors in the same year. The proportion of mangos processed into

achar declined by 17% between 2017/18 and 2018/19 marketing seasons. The quantity of mangos processed into juice increased from 15 526 tons in 2017/18 to 15 547 ton in 2018/19, an increase of 0.1%. Figure 3 indicates that over the past decade a large proportion of the annual South African mango crop is processed either into dried mangos, achar or juice.

Figure 3: Mango crop distribution, 2010 – 2018/19

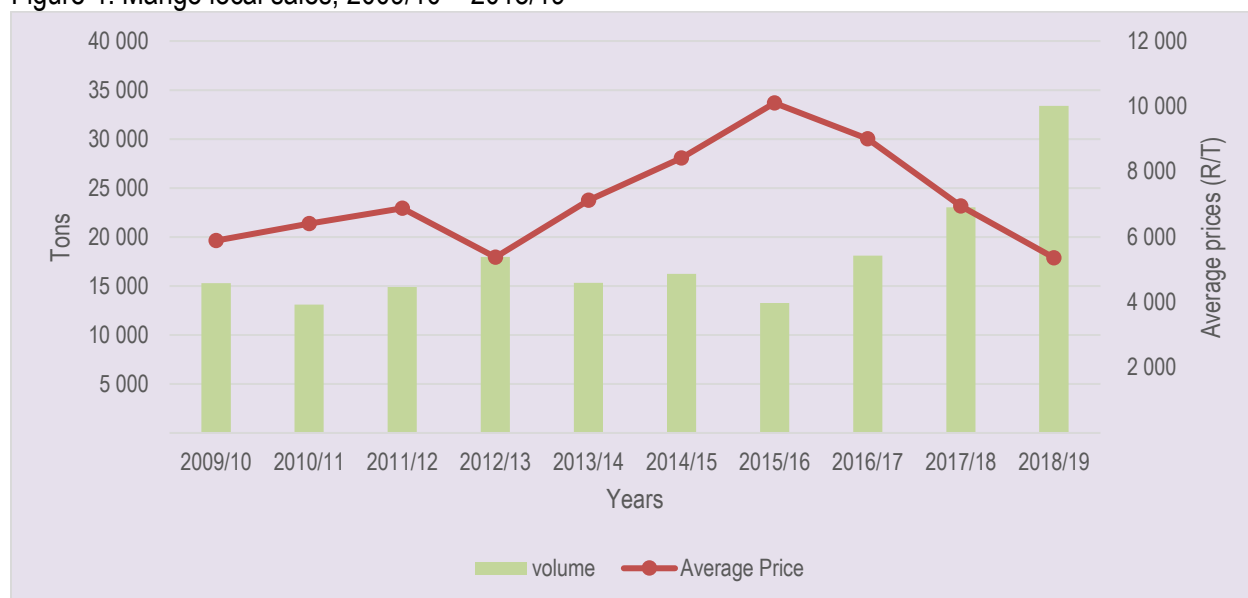


Source: Subtrop, 2019; Quantec Easydata, 2020

## 2.1 Domestic markets

The volume of sales and the average prices of mangos sold at the NFPMs are presented in Figure 4. As witnessed in Figure 3, a total volume of 33 382 tons of mangos were sold through the National Fresh Produce Markets (NFPMs) during the 2018/19 marketing season. This represents approximately 45% of the total mango crop produced during the same season. The volume of sales at the NFPMs have been relatively stable over the last decade, remaining above 15 000 tons per annum except during 2010/11, 2011/12 and 2015/16 when sales dropped to 13 102, 14 891 and 13 306 tons , respectively. The period between 2009/10 and 2018/19 marketing seasons witnessed a 118% increase in volumes of mangos sold through the NFPMs. At the same time average prices realised at the markets decreased by 9% over the same period. The average price realised at the markets in 2018/19 was R5 365.00 per ton. This was 23% lower than the average price during the previous year (2017/18). NFPMs serve as centres of price discovery for the local mango market.

Figure 4: Mango local sales, 2009/10 – 2018/19



Source: Statistics and Economic Analysis, DAFF

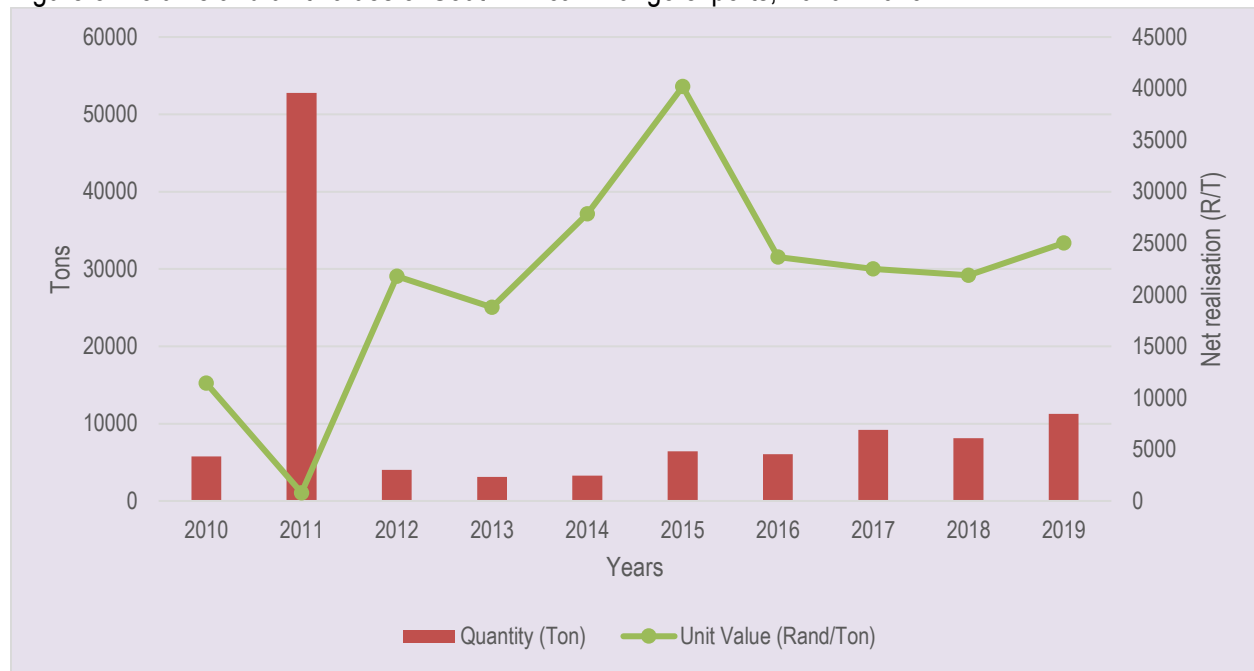
## 2.2 Exports

Volumes and unit values for mangos exported by South Africa during the past ten years are presented in Figure 5. The figure clearly indicates that South Africa is relatively a small exporter of mangos in the world. The mango exports during the period under review remained low, recording export volumes below 10 000, with the exception of 2011 export season. The highest volume exported by South Africa during the last decade was in 2011 when the country exported 52 782 tons mangos worth approximately R41 million. Exports also passed the 10 000 tons in 2019 season. During the same year (2011) Botswana accounted for 95% of South Africa's mango exports. As can be noted in Figure 4, a large proportion of South Africa's annual mango crop is processed and sold through the NFPMs, leaving very small quantities available for the export market. A total volume of 11 245 tons of mangos was exported by South Africa in 2019. This was 38% increase than the volume exported in 2019 and 95% higher than the volume exported ten years ago.

At the same time while the quantity of mango exports is declining the unit values have been on the rise during the first five years of the review period, except in 2011 when prices dropped to record R794.00 per ton. During 2011 season, it was profitable to sell on the local market. In the past four years, prices were relatively stable. During the previous decade prices increased from R11 433 per ton in 2010 to R25 013 per ton in 2019 (an increase of 119%). The 2019 unit value ( R25 013/ton) was 14% higher than the unit value (R21 873/ton) of the previous year (2018). The lower quantities of mango exports coupled with increasing imports points to a growing local market, tough international competition and lack of growth in respect of local mango production.



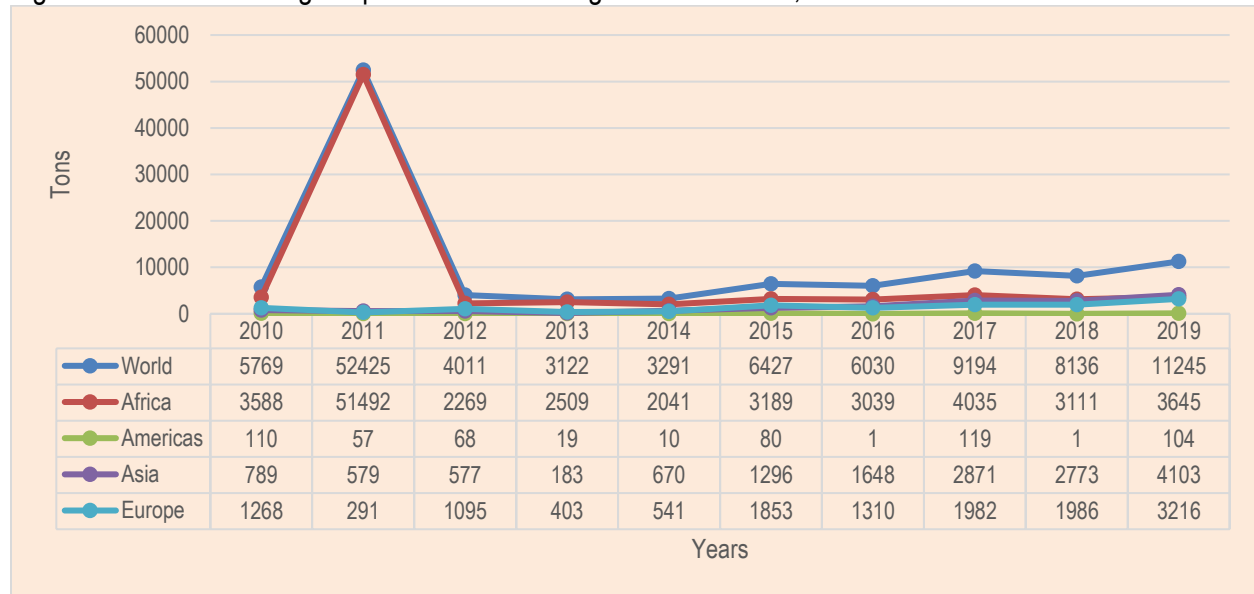
Figure 5: Volume and unit values of South African mango exports, 2010 - 2019



Source: Quantec Easydata, 2020

Volumes of exports of South African mangos to the different regions of the world during the past decade are presented in Figure 6. It is evident from Figure 6 that during the past decade, most of South Africa's exports of mangos were destined for the African, Asian and European markets. In 2019, exports to Europe accounted for 29% of total South African mango exports while those to Africa accounted for 32% and those to Asia accounted for 36%. It is important to note that exports to Europe have been below 2 000 tons since with the exception of 2019. Africa has been the leading export destination for South African mangos between 2010 and 2018. Asia has been the second most importer of South African mangos and overtook Africa as the leading exporter in 2019. During the period under review exports to Africa peaked at 51 688 tons in 2011 while exports to Asia and Europe peaked at 4 103 tons and 3 216 tons respectively in 2019. Exports of mangos to Africa have also been relatively stable during the past five years averaging 3 404 tons. However, export to Africa rose by 17% in 2019 while exports to the Asia and Europe increased by 48% and 62% during the same period.

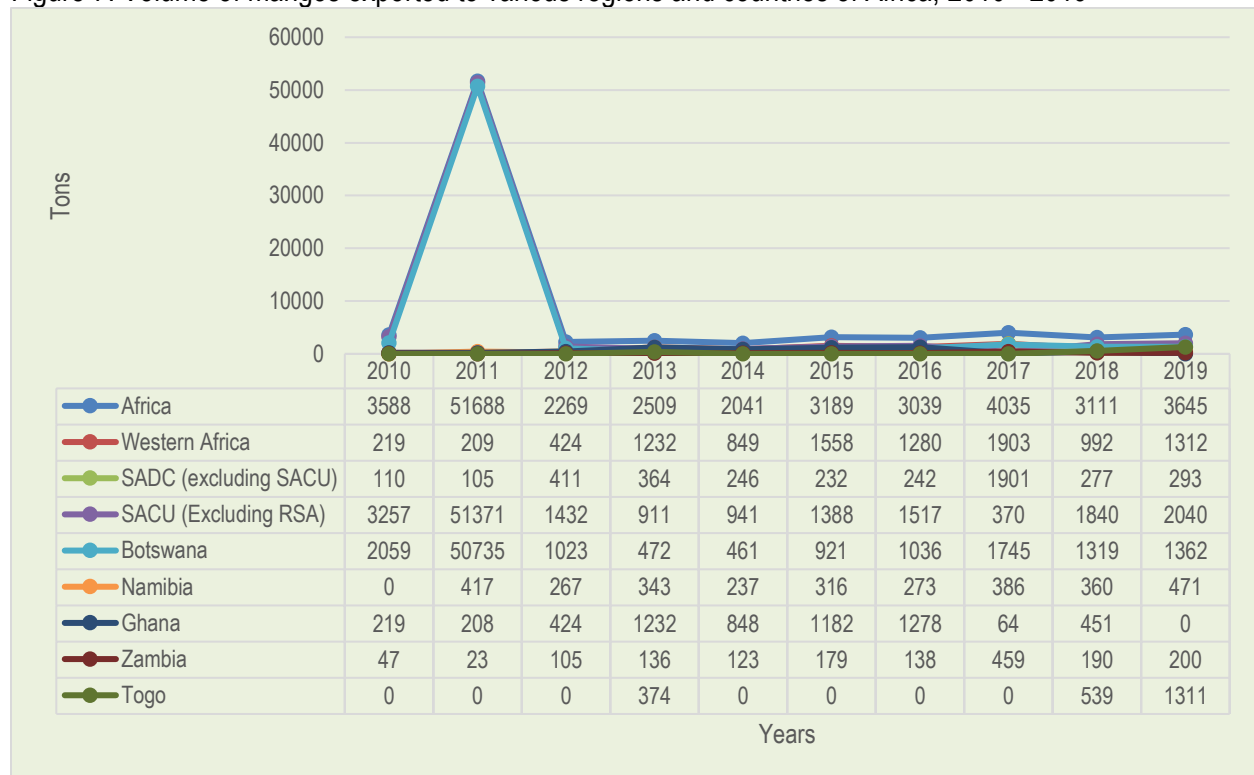
Figure 6: Volume of mango exported to various regions of the world, 2010 - 2019



Source: Quantec Easydata

Due to its significance to South African mango exports, the Africa is further analysed below. Volumes of mango exports to various regions and countries in Africa during the past decade are presented in Figure 7.

Figure 7: Volume of mangos exported to various regions and countries of Africa, 2010 - 2019

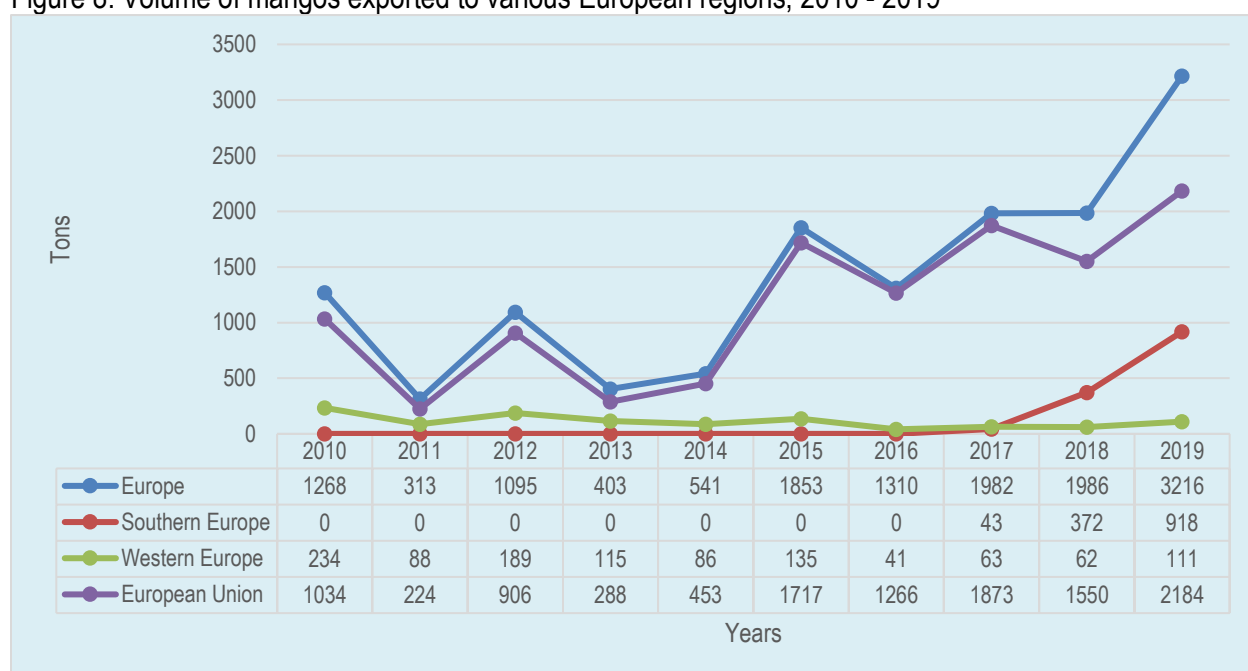


Source: Quantec Easydata

In Africa, SACU (excluding South Africa) and Western Africa have been the dominant importers of South African mangos during the past ten years both accounting for 92% of South African exports to Africa. In 2019, SACU (excluding South Africa) accounted for (56%) of mangos, exports by South Africa destined to Africa while Western Africa accounted for 36% of mango export. The main destination of South African mango exports in SACU region is Botswana and to lesser extent Namibia. The main market for South African mangos in Western Africa is mainly Ghana and Togo with the latter accounting for almost all mango exports to that region during the past ten years. The other region with enormous potential is SADC in particular Zambia.

According to Figure 6, Europe has been one of the largest export destinations for South African mangos during the last decade. Within Europe, exports of South African mangos are normally distributed between the European Union and Western Europe (see Figure 8).

Figure 8: Volume of mangos exported to various European regions, 2010 - 2019



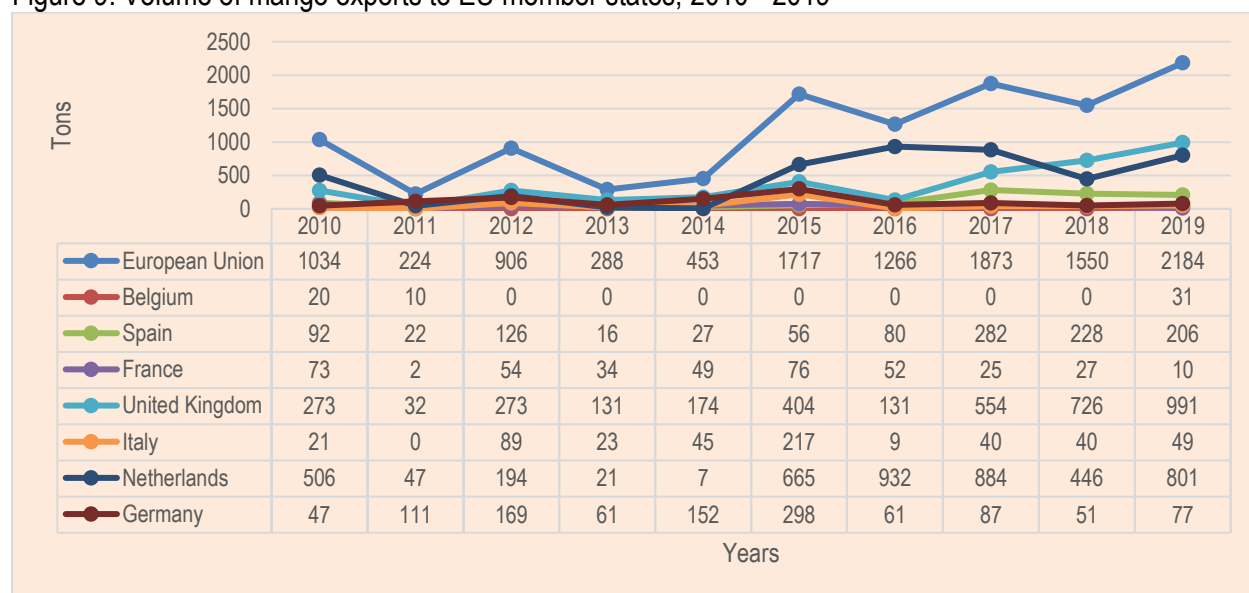
Source: Quantec Easydata

It can be observed from Figure 8 that the European Union usually absorbs over 80% of the total South Africa's annual exports of mangos into the European continent with the remainder being absorbed by Southern Europe and Western Europe. During 2019 however, Southern and Western Europe absorbed approximately 29% and 3% respectively of the total South African mango exports to Europe. South African mango exports to Europe went up by 41% between 2018 and 2019.

Due to its significance to South African mango exports, the European Union is further analysed below. The European Union consists of 25 member states. Volumes of South African mangos exports to the European Union member states during the last decade are depicted in Figure 10. It is important to note that only those countries in which mango imports from South Africa were at least 100 tons in at least one year in the period under review are shown in Figure 9.

As can be observed from Figure 9 the major importers of South African mangos in the European Union include the Netherlands, the United Kingdom and Germany. In 2019, the three countries accounted for 82% of all South African mango exports to the European Union. Exports to the Netherlands peaked at 932 tons in 2016 and accounted for 37% of mango exports to European Union during 2019. Another major market for South African mangos in 2019 was United Kingdom which absorbed 45% of total South African exports of mangos to the EU in the same year. Export to the EU increased by 41% between 2018 and 2019 and also increased by 111% between 2010 and 2019.

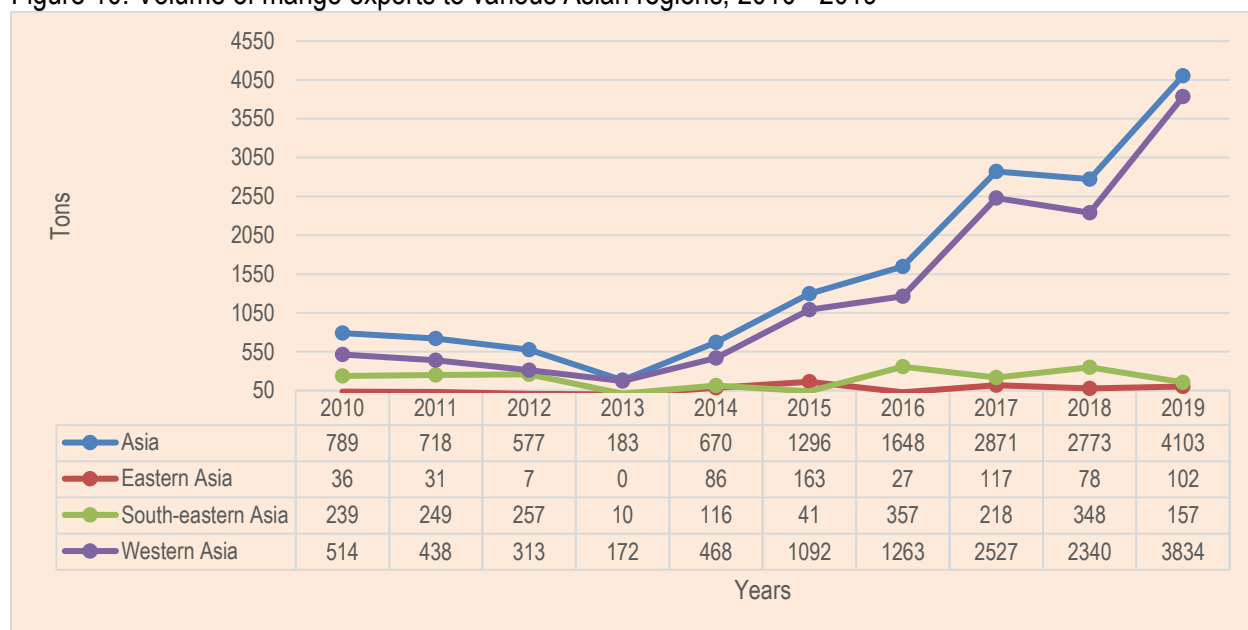
Figure 9: Volume of mango exports to EU member states, 2010 - 2019



Source: Quantec Easydata

According to Figure 10 Asia has been the third largest export destination for South African mangos during the last decade. Figure 10 shows volumes of South African mango exports to Asia for the period 2010 to 2019. Western Asia, which includes countries like the United Arab Emirates (UAE), Bahrain, Saudi Arabia, Qatar, Oman, and Kuwait, is the leading export destination for South African mangos in Asia, accounting for 93% of total South African mango exports to the Asian continent in 2019. It is worth noting that exports to the Western Asia region have increased significantly during 2010 and 2019, moving from 514 tons in 2010 to 3 834 tons in 2019 (an increase of 646%). Western Asia was followed by South-Eastern Asia at 4% share during 2019.

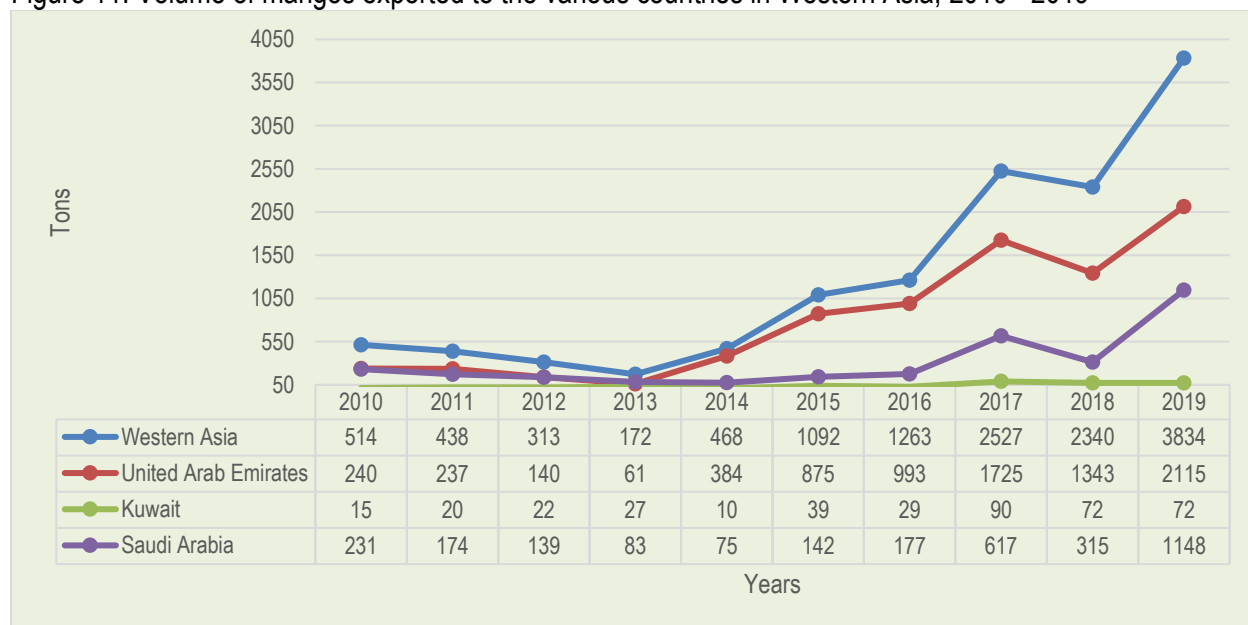
Figure 10: Volume of mango exports to various Asian regions, 2010 - 2019



Source: Quantec Easydata

Volumes of mangos exported to the various countries within Western Asia during the last ten years are presented in Figure 11. Within Western Asia, the major importers of South African mangos are the United Arab Emirates (UAE) and Saudi Arabia. The two countries accounted for 85% of all South African mango exports to Western Asia in 2019. Another market with enormous potential for future growth within the region is Kuwait.

Figure 11: Volume of mangos exported to the various countries in Western Asia, 2010 - 2019



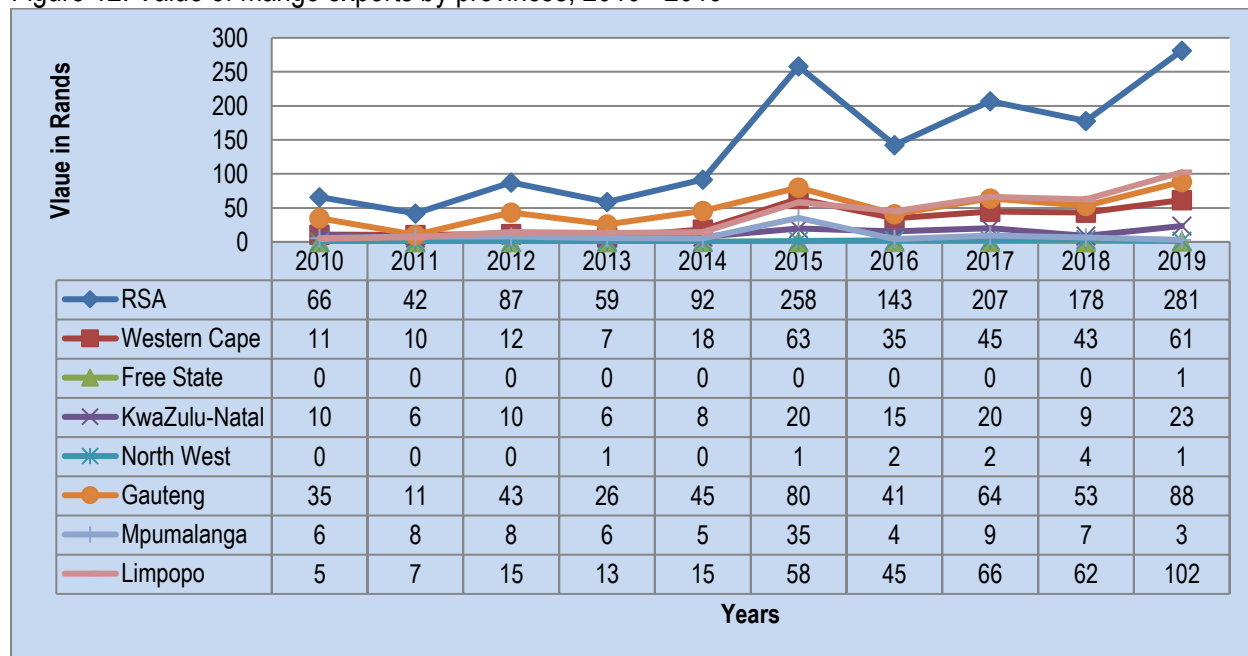
Source: Quantec Easydata

The contributions of the different provinces and districts to the total South Africa mango exports are explored in the following subsection.

### 2.3 Provincial and district export values of South African mangos

A review of provincial level trade data presents an interesting but somewhat misleading view of the source of mangos destined for the export markets. Firstly, the fact that 22% and 31% of mangos exported in 2019 were from the Western Cape and Gauteng provinces do not imply that the mangos were produced there but that the registered exporters were based in both the Western Cape and Gauteng. Secondly, provinces like the Western Cape serve as exit points for mango exports through the Cape Town harbour. Figure 12 below depicts the value of mango exports from each province of South Africa. A total value of R281 million worth of mango exports was reported by South Africa in 2019. The provinces of Gauteng, Western Cape and Limpopo were leaders in mango exports during 2019. The three provinces together accounted for 90% of the total value of mango exports reported by provinces in 2019. Other provinces featured intermittently but usually registered minimal trade.

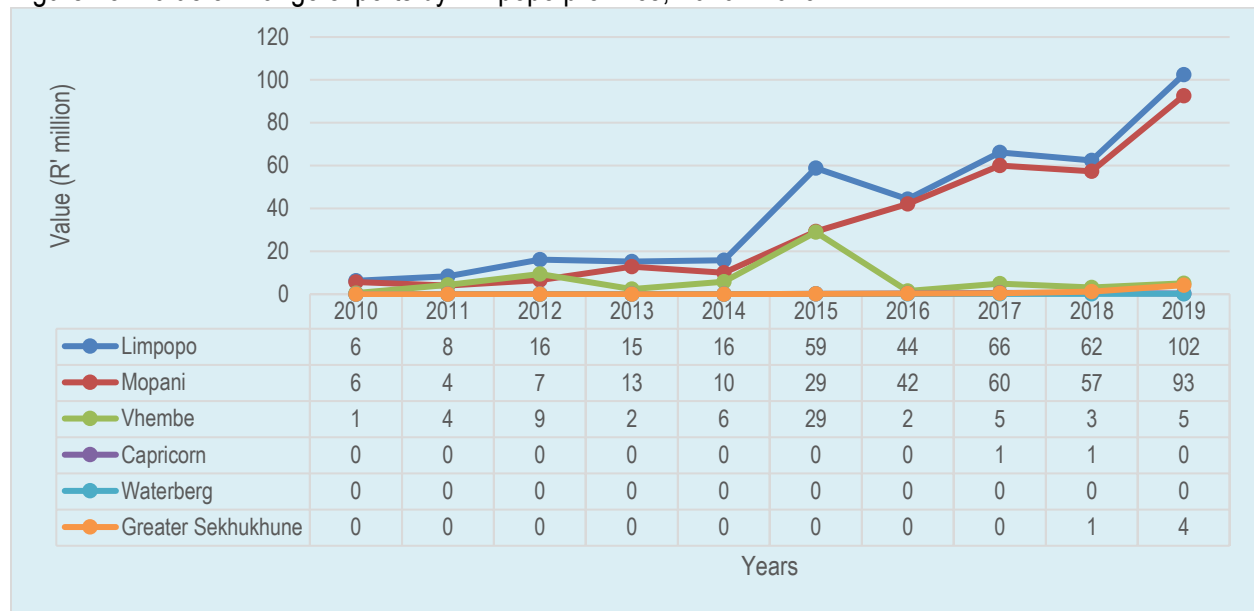
Figure 12: Value of mango exports by provinces, 2010 - 2019



Source: Quantec Easydata

The following figures (Figures 13 – 18) show the value of mango exports from the various districts in the six provinces of South Africa that recorded mango exports in at least one year during the last ten years. Figure 13 illustrates values of mango exports by the Limpopo province. Limpopo province exported mangos to the value of R102 million in 2019. The majority of mango exports from Limpopo province are mainly from the Mopani and Vhembe district municipalities. The Mopani districts reported mango exports worth R93 million and Vhembe reported mangos worth R million in 2019. The total export value reported by Limpopo province decreased from R57 million in 2018 to R93 million in 2019.

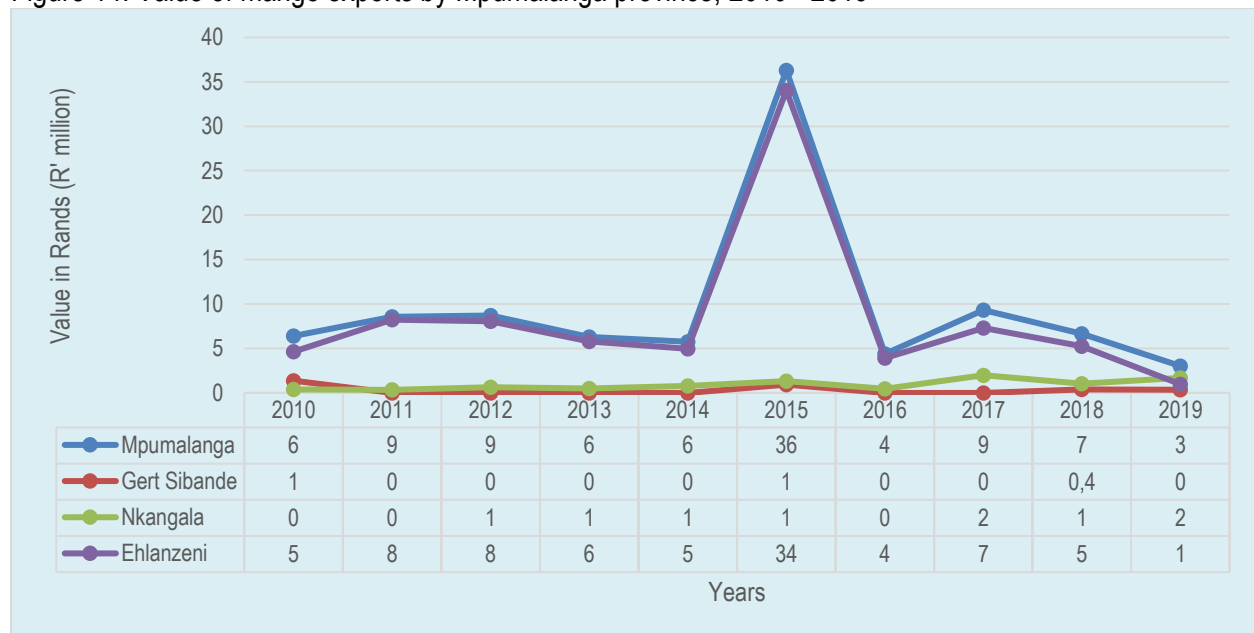
Figure 13: Value of mango exports by Limpopo province, 2010 - 2019



Source: Quantec Easydata

Values of mango exports from the Mpumalanga province are depicted in Figure 14.

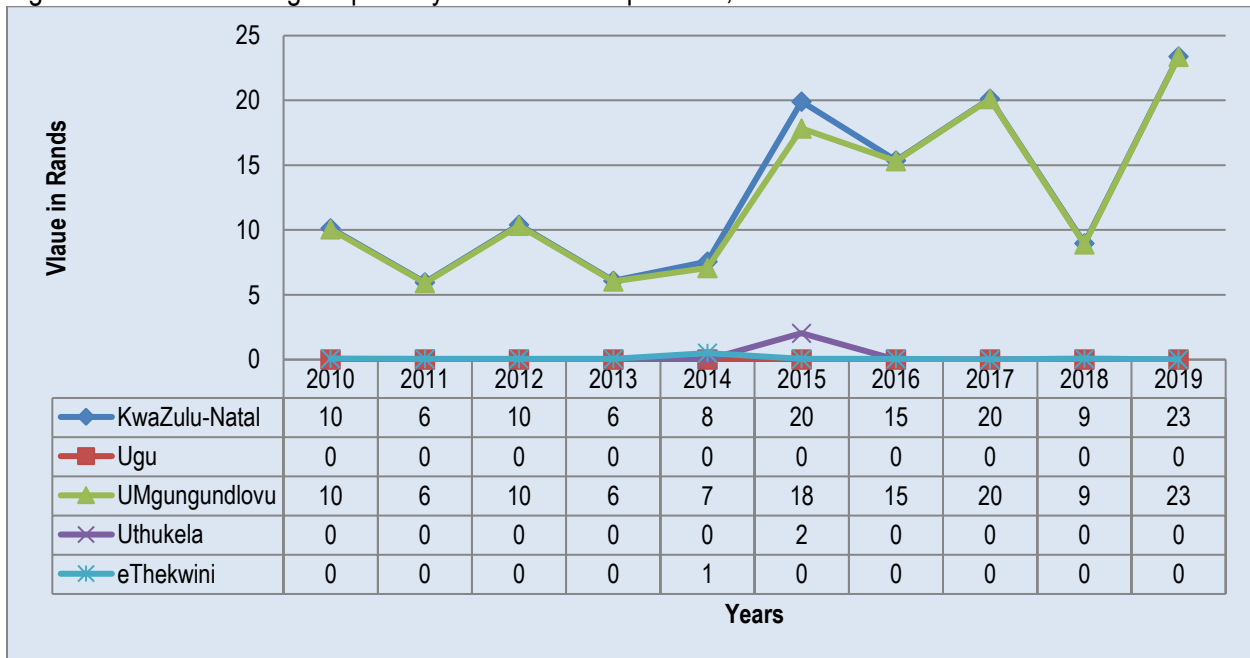
Figure 14: Value of mango exports by Mpumalanga province, 2010 - 2019



Source: Quantec Easydata

A total value of R3 million worth of mango exports was reported by Mpumalanga during 2019. This was up from the R4 million recorded in 2016. The major mango exporting regions in Mpumalanga province are the Nkangala and Ehlanzeni district municipalities. Ehlanzeni district recorded R1 million worth of mango exports during 2019 while the Gert Sibande district reported nothing during the same year. Values of mango exports from the Kwazulu Natal province are shown in Figure 15.

Figure 15: Value of mango exports by Kwazulu Natal province, 2010 - 2019



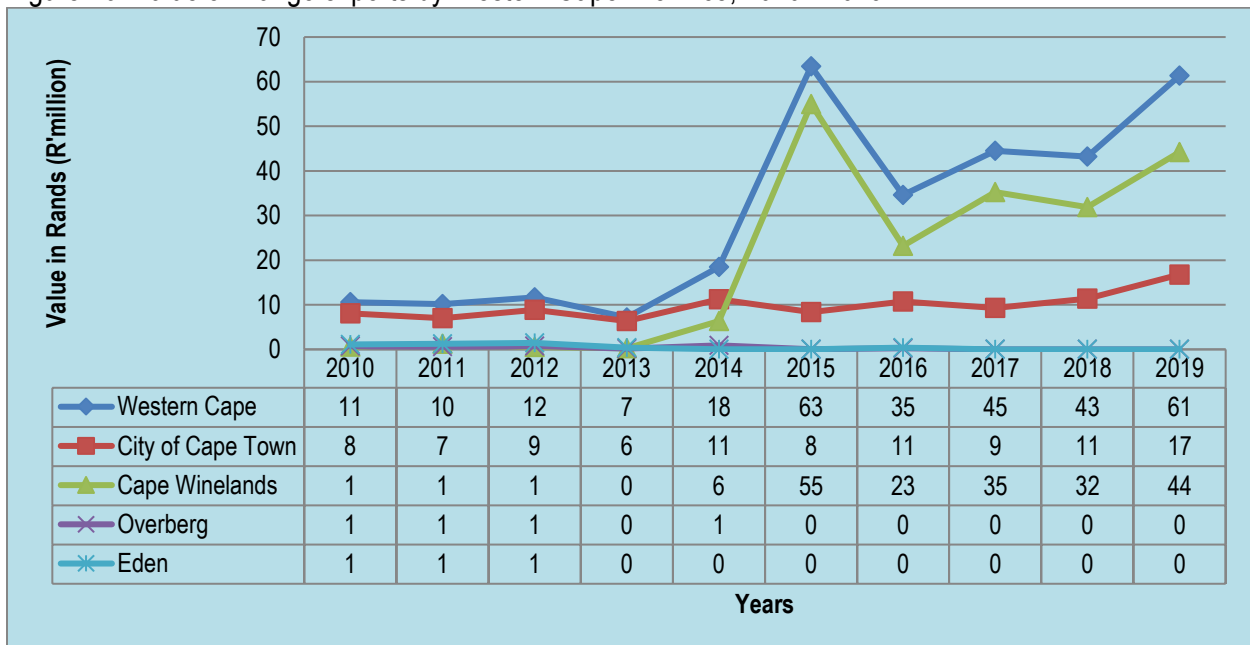
Source: Quantec Easydata

The province of Kwazulu Natal reported mango exports worth R23 million in 2019. The value was up from the R9 million reported by the province in 2018. It is clear from Figure 15 that almost all mango exports reported in Kwazulu Natal during the last five years were from Umgungundlovu district. EThekweni municipality also recorded some exports during the last ten years but remained minimal.

Figure 16 shows that mango exports from the Western Cape province are mainly from the Cape Winelands and to a lesser extent City of Cape Town. The Western Cape recorded mango exports worth R43 million in 2019. The value was down from the R45 million recorded in 2018. The City of Cape Town accounted for R17 million of the total value of mango exports recorded by the Western Cape in 2019 while the Cape Winelands accounted for R44 million during the same year. The use of the Cape Town harbour as an exit point plays a major role in the City of Cape Town being a leader in the export of mangos from the Western Cape province.



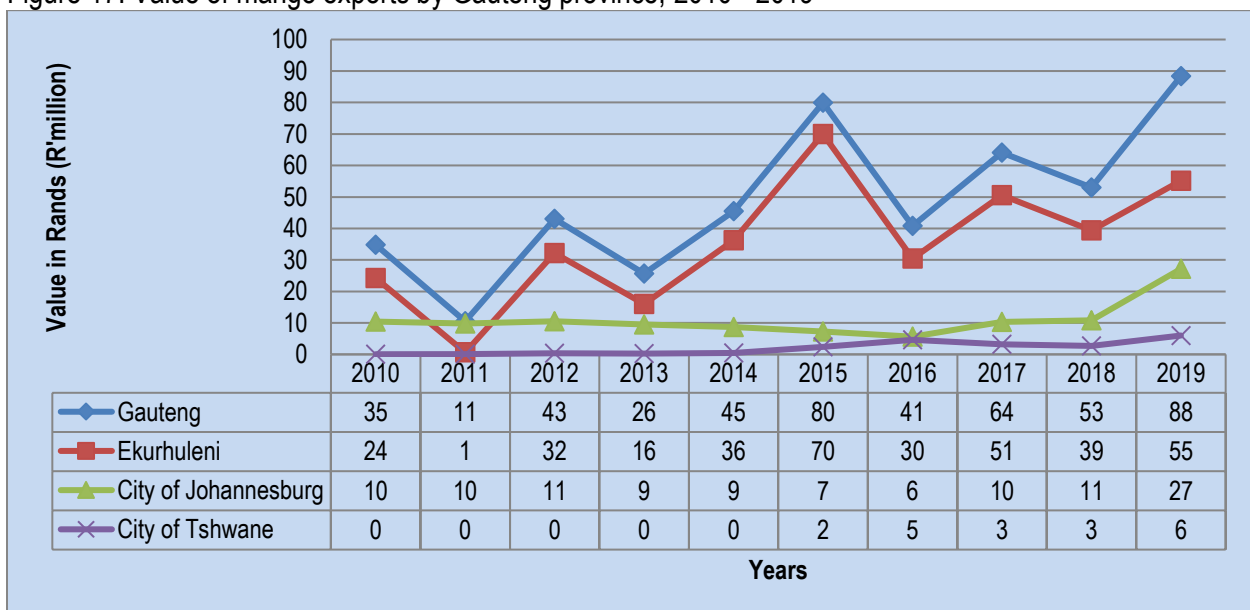
Figure 16: Value of mango exports by Western Cape Province, 2010 - 2019



Source: Quantec Easydata

Values of mango exports from the Gauteng province are shown in Figure 17.

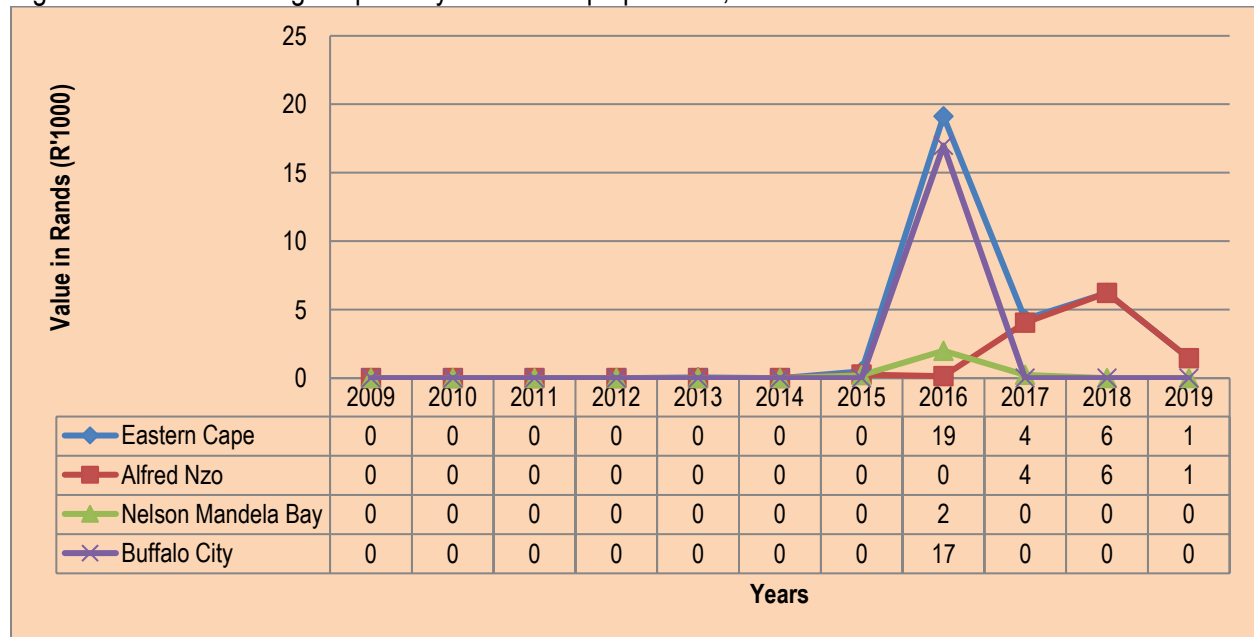
Figure 17: Value of mango exports by Gauteng province, 2010 - 2019



Source: Quantec Easydata

There was an increase in the value of mangos exported by Gauteng in 2019 when compared with the previous years. Mangos worth R88 million were exported by the Gauteng province in 2019. This was up from the R55 million reported in 2018. The major exporters of mangos in Gauteng are Ekurhuleni and the City of Johannesburg. Ekurhuleni municipality accounted for R55 million of all exports of mangos in Gauteng during 2019 while the City of Johannesburg accounted for R27 million. Ekurhuleni has been the dominant mango-exporting district in Gauteng for the past ten years. The City of Johannesburg has however regained the top spot as the leading exporter of mangos in Gauteng during 2011 before Ekurhuleni reclaimed the first spot between 2012 and 2019. Values of mango exports from the Eastern Cape are presented in Figure 18.

Figure 18: Value of mango exports by Eastern Cape province, 2010 - 2019



Source: Quantec Easydata

During the last decade the Eastern Cape province recorded a very low exports of mangos. This is evident from the graph, between 2010 and 2015 the province had no Mango exports. The exports worth R1 thousand was recorded during 2019. This is 77% decrease as compare to the previous year 2018.

## 2.4 Share Analysis

Table 2 is an illustration of provincial shares towards national mango exports. It shows that Mpumalanga together with the Western Cape, Gauteng, Limpopo and Kwazulu Natal provinces have commanded the greatest share of mango exports for the past ten years. Gauteng contributed 31%, Mpumalanga contributed 1%, the Western Cape contributed 22%, and Limpopo contributed 36% while Kwazulu Natal contributed 8% respectively in 2019. Except in the cases of the Western Cape and Gauteng, the contributions by the leading provinces are as expected because Limpopo, Mpumalanga and Kwazulu Natal are the leading producers of mangos in South Africa.

**Table 2: Share of provincial mango exports to the total RSA mango exports (%)**

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
RSA	100	100	100	100	100	100	100	100	100	100
Western Cape	16	24	13	12	24	25	24	21	24	22
KwaZulu-Natal	15	14	12	10	8	8	11	10	5	8
North West	0	0	0	20	10	00	1	1	2	0
Gauteng	53	25	49	44	45	31	29	31	30	31
Mpumalanga	9	19	9	10	6	14	3	4	4	1
Limpopo	7	17	17	23	16	23	32	32	35	36

Source: Calculated from Quantec Easydata

The accompanying tables (Table 3 to 8) show shares of the various districts' mango exports to the various provincial exports.

**Table 3: Share of district mango exports to the Limpopo provincial mango exports (%)**

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Limpopo	100	100	100	100	100	100	100	100	100	100
Mopani	89	39	36	82	60	50	95	91	92	91
Vhembe	11	61	64	18	39	50	5	8	6	5
Greater Sekhukhune	0	0	0	0	0	0	0	0	2	4

Source: Calculated from Quantec Easydata

Table 3 presents the shares of district mango exports to the total Limpopo provincial mango exports for the years 2010 to 2019. The dominant district in mango exports from the Limpopo province is the Mopani district. The district accounted for almost all mango exports reported from the Limpopo province during the past decade, with the balance accounted for by the Vhembe and Sekhukhune districts. In 2019 both Mopani districts contributed 90%, Vhembe contributed the remaining 5% and Sekhukhune accounted for 4% of total Limpopo mango exports.

**Table 4: Share of district mango exports to the Mpumalanga provincial mango exports (%)**

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Mpumalanga	100	100	100	100	100	100	100	100	100	100
Gert Sibande	24	0	0	0	0	0	6	0	6	12
Nkangala	0	0	7	8	14	4	10	21	15	56
Ehlanzeni	76	100	93	92	86	96	94	79	79	32

Source: Calculated from Quantec Easydata

The shares of district mango exports to the total Mpumalanga provincial mango exports are presented in Table 4. Nkangala is the leading district in terms of mango exports from Mpumalanga and 56% of all mango exports recorded during 2019 were from the Nkangala district. Another significant contributor in recent years has been the Ehlanzeni district but recorded nothing in 2019.

**Table 5: Share of district mango exports to the Kwazulu Natal provincial mango exports (%)**

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
KwaZulu-Natal	100	100	100	100	100	100	100	100	100	100
Ugu	0	0	0	0	0	0	0	0	0	0
UMgungundlovu	99	99	99	99	93	90	100	100	100	100
Uthukela	0	0	0	0	0	10	0	0	0	0
eThekwini	1	1	1	1	7	0	0	0	0	0

Source: Calculated from Quantec Easydata

In Kwazulu Natal the leading district in mango exports in 2017 was the Umgungundlovu district, at 100% (see Table 5). . Another consistent contributor to total provincial mango exports in Kwazulu Natal is the EThekwini district but it contributed nothing in 2017.

**Table 6: Share of district mango exports to the Western Cape provincial mango exports (%)**

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Western Cape	100	100	100	100	100	100	100	100	100	100
City of Cape Town	77	69	76	89	67	13	31	21	26	27
Cape Winelands	6	12	5	3	29	87	67	79	74	72
Overberg	7	6	7	2	4	0	1	0	0	0
Eden	11	13	12	6	0	0	1	0	0	0

Source: Calculated from Quantec Easydata

The shares of district mango exports to the Western Cape provincial mango exports are shown in Table 6. The Cape Winelands is the dominant contributor (72% in 2019) to total Western Cape provincial mango exports. Another significant role player in the Western Cape during the last decade is the City of Cape Town. It contributed 27% to total mango exports by the Western Cape Province during 2019. The Overberg and Eden districts also contributed to total Western Cape mango exports during the past ten years.

**Table 7: Share of district mango exports to the Gauteng provincial mango exports (%)**

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Gauteng	100	100	100	100	100	100	100	100	100	100
Ekurhuleni	70	6	75	62	89	88	76	79	74	62
City of Johannesburg	30	93	24	37	9	9	14	16	20	31
City of Tshwane	0	1	1	1	2	3	10	5	5	7

Source: Calculated from Quantec Easydata

In the Gauteng province, the district contributions are mainly distributed among the Ekurhuleni and City of Johannesburg districts (see Table 7). The Ekurhuleni district accounted for 62% of total provincial mango exports from Gauteng in 2019, while the City of Johannesburg contributed 31 percent. The City of Tshwane also contributed 7% during the same year.

**Table 8: Share of district mango exports to the Eastern Cape provincial mango exports (%)**

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Eastern Cape	0	0	0	100	0	100	100	100	100	100

Alfred Nzo	0	0	0	0	0	55	1	94	100	100
Nelson Mandela Bay	0	0	0	0	0	45	10	6	0	0
Buffalo City	0	0	0	0	0	0	89	0	0	0

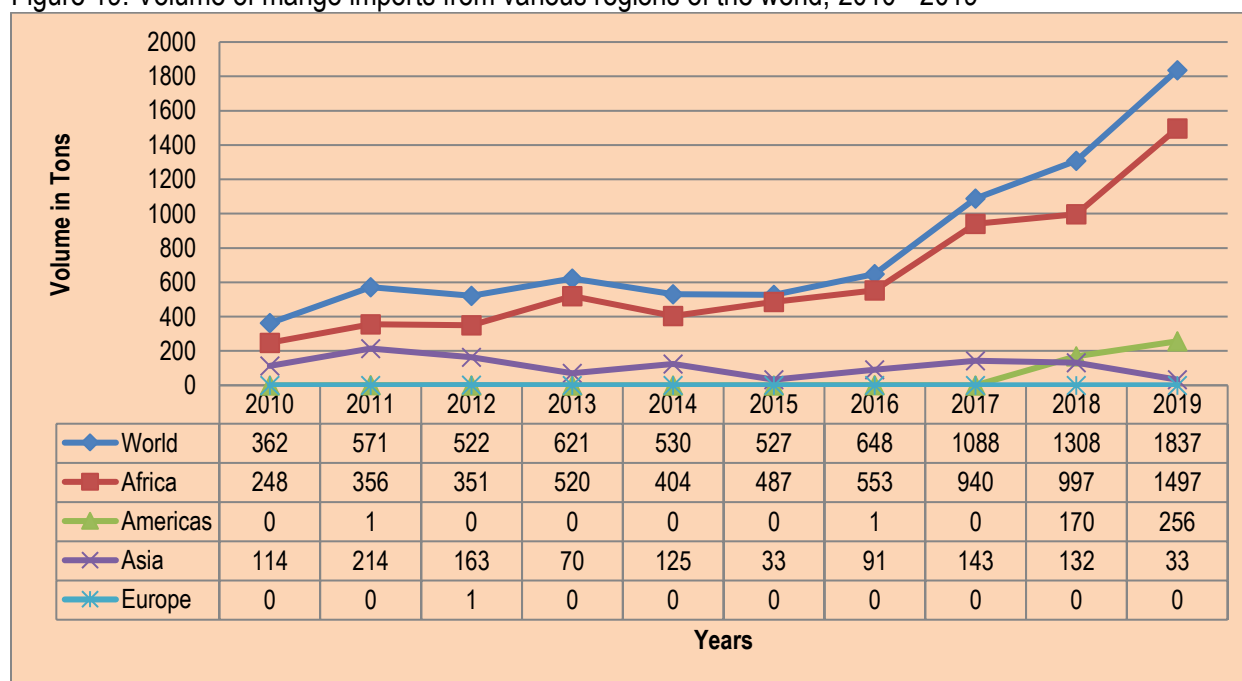
Source: Calculated from Quantec Easydata

In the Eastern Cape, Alfred Nzo contributed all of the mango export in 2019. Alfred Nzo surpassed Buffalo City as the leading mango exporting district in the Eastern Cape.

## 2.5 Imports

In 2019, South Africa's imports of mangos represented 0.001% of world mango imports and its ranking in the world was number 66. This clearly shows that South Africa is not a major importer of mangos. Volumes of South Africa's mango imports from the different regions of the world during the last ten years are presented in Figure 19. A total volume of 1 837 tons of mangos worth R22.8 million was imported by South Africa in 2019. During the period under review, imports peaked at 1 870 tons in 2019 and were at their lowest during 2010 at 362 tons. The biggest supplier of South Africa's mango imports is Africa, accounting for 81% of the country's total mango imports in 2019. Africa was followed by Asia at 14% during the same year.

Figure 19: Volume of mango imports from various regions of the world, 2010 - 2019

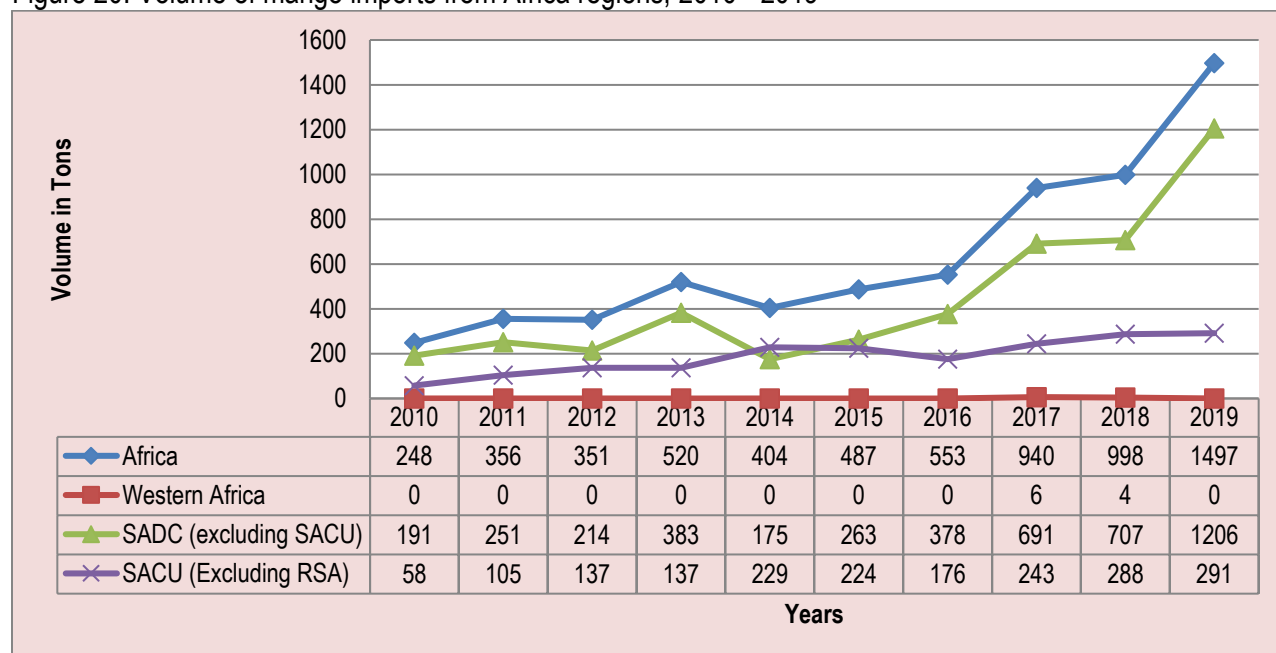


Source: Quantec Easydata

Due to its significance to South Africa's overall imports of mangos, the African continent is further analysed below. Volumes of South Africa's imports of mango from the different African regions and countries during the last decade are presented in Figure 20. It is evident from Figure 20 that the majority of South Africa's mango imports from the African continent are from the Southern African Development Community (SADC) (excluding SACU) region. During 2019, the SADC region contributed 81% of mango imports from Africa. The other region that contributes higher imports is South African Customs Union (SACU) which accounted

for 19% of South African mango imports. South Africa's imports of mangos from SADC are mainly from Mozambique and Zimbabwe. Mozambique accounted for 63% of total South Africa mango imports from Africa in 2019. Imports from SACU (excluding South Africa) are mainly from Namibia and Swaziland.

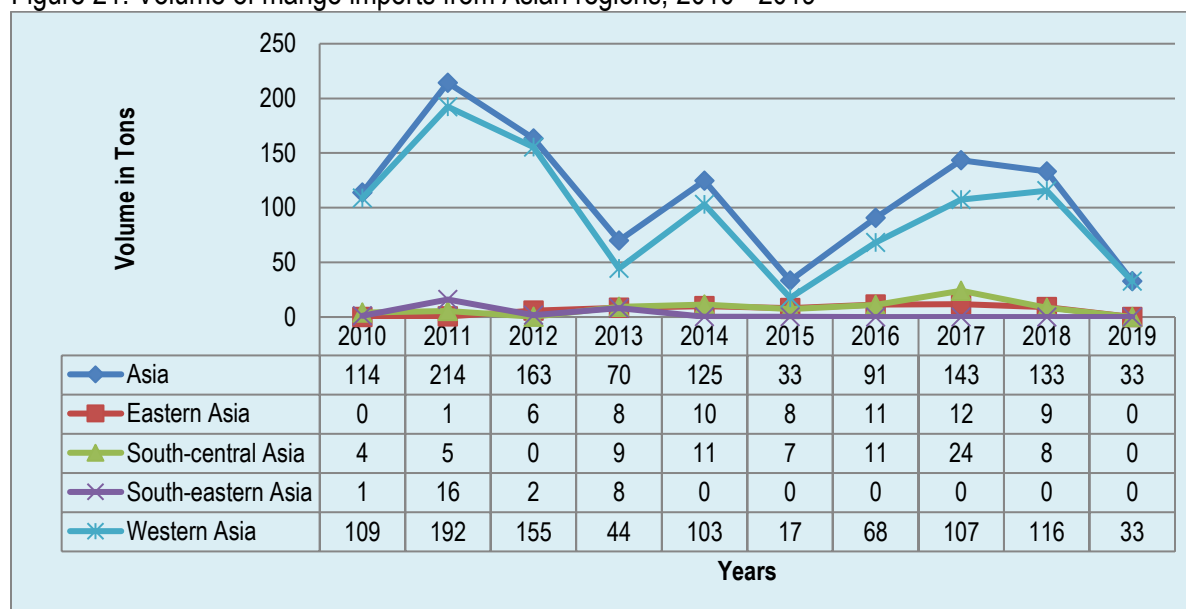
Figure 20: Volume of mango imports from Africa regions, 2010 - 2019



Source: Quantec Easydata

The other important continent in the supply of mangos to South Africa is Asia. Volumes of mango imports by South Africa from the different Asian regions and countries during the past ten years are presented in Figure 21. The majority of South Africa's mango imports from the Asia continent originate from the Western Asia region. The region accounted for all of total South African mango imports from Asia in 2019. Within Western Asia, the major contributor to South Africa's imports of mangos is Lebanon. Imports from Lebanon increased from no imports in 2018 to 22 tons in 2019, an increase of 100% in ten years.

Figure 21: Volume of mango imports from Asian regions, 2010 - 2019



Source: Quantec Easydata

## 2.6 Mango uses

Processing is extremely important to the mango industry. Mangos are primarily processed into canned mango, mango juice, concentrated mango drinks (e.g. mango fizzy drink), mango pulp, dehydrated/dried mangos, mango jams, chutneys, achar and mango-applied products (e.g. mango skin cream, mango detergent).

### 2.6.1 Primary product

Selecting the ripeness of mangos can be determined by either smelling or squeezing. A ripe mango will have a full, fruity aroma emitting from the stem end. Mangos can be considered ready to eat when slightly soft to the touch and yielding to gentle pressure, like a ripe peach.

### 2.6.2 Medicinal uses

Mango is one of the most recommended fruits to fight beriberi and to heal bronchial diseases since a mixture of mango pulp and honey can be made at home to fight bronchitis. Mango is an excellent depurative for the organism and it is recommended for nervous people, to fight insomnia, to heal brain fatigue, mental depression and as a laxative. It is very helpful to fight heartburn. It has excellent results when used to eliminate kidney sand and to assist digestion. Mangos, beyond being delicious and rich in vitamins, minerals and anti-oxidants, contain enzymes with stomach soothing properties.

Mangos are an excellent source of Vitamins A and C, as well as a good source of Potassium and contain beta-carotene. Mangos are high in fibre, but low in calories (approx. 110 per average sized mango), fat (only 1 g) and sodium. Mangos are a good staple for a daily diet.

### 2.6.3 By-products

Mango kernel contains high amounts of fat and starch. The oil extracted from kernel is of good quality and could be used in cosmetic and soap industries. The kernel flour (starch) after mixing with wheat or maize flour is used in chapaties in India. About ten percent alcohol could be obtained from mango kernel by co-culture fermentation.

## 3. GROWTH, VOLATILITY & STABILITY ANALYSIS

Table 9 presents the results of growth and coefficient of variation estimations. They were calculated using yearly statistics and covered the same ten-year period under review beginning in 2010 and ending in 2019. The coefficient of variation is a measure of volatility or stability. When the coefficient of variation is less than one, the variable in question is said to be relatively stable, meaning that there were minimal changes. When the coefficient of variation is more than one, it is said to be volatile, meaning there were major changes during the period under review.

**Table 9: Mango industry growth rates & variation coefficients (2010 – 2019)**

Category	Subcategory	Growth Rate (%)	Coefficient of Variation
<b>Production</b>	Gross Value (GV)	4.80	0.29
	Volume	2.18	0.18
<b>Sales at NFPMs</b>	GV/Price	-0.93	0.20
	Volume	8.13	0.19
<b>Export</b>	Gross Value	8.14	0.59
	Volume	6.90	1.69
<b>Import</b>	Gross Value	0.26	0.34
	Volume	-0.50	0.21

Source: Calculated from data from Statistics and Economic Analysis, DAFF and Quantec

As shown in Table 9 above, the mango industry experienced a positive growth rate from 2010 to 2019 in terms of values while with the exception of volumes sold at the NFPMs and export volumes which experienced negative growth over the same period.

Table 9 also shows various levels of volatility at different levels of the mango industry's yearly figures over the same period (2010 to 2019). Low volatility was indicated by the coefficients of variation that were less than one (<1). All variables have values less than 1, which means that on a weighted variance scale, they displayed minimal changes during the ten years under review.

## 4. MARKET INTELLIGENCE

### 4.1 Competitiveness of South African mango exports

Competitiveness is described as an industry's capacity to create superior value for its customers and improved profits for the stakeholders in the value chain. The driving force in sustaining a competitive



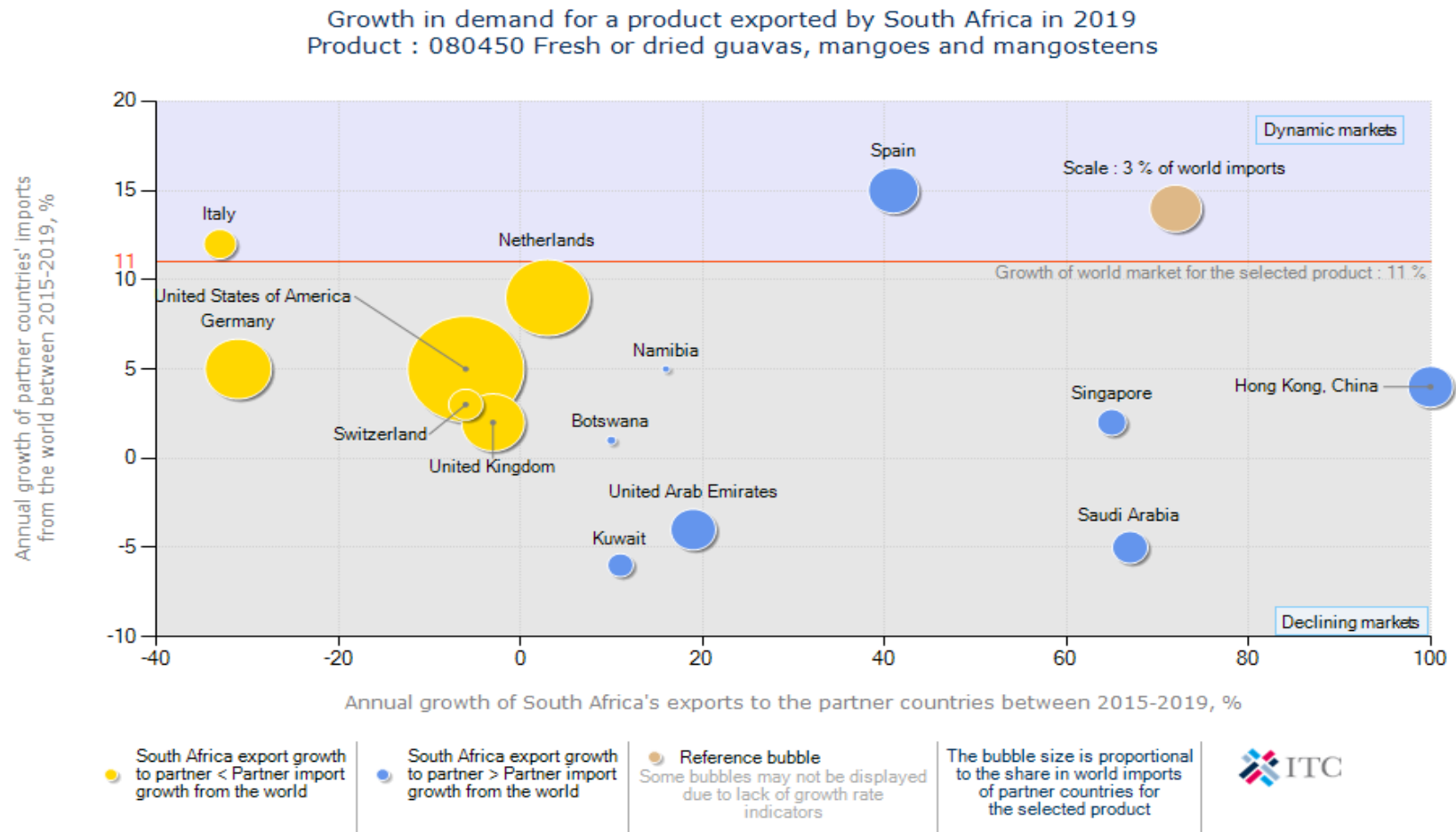
position is productivity that is output efficiency in relation to specific inputs with regard to human, capital and natural resources. In 2019, South African mango exports represented 0.6% of world exports and its ranking in the world exports was number 28. Figure 22 illustrates growth in demand for South African mangos in 2017. The average distance of importing countries is 7 672 km and the export concentration is 0.08.

As depicted in Figure 22, South Africa's mango exports are growing faster than the world imports in Spain, Botswana, Hong Kong, China Namibia and Singapore. South Africa's performance in those markets can be regarded as gains in dynamic markets.

At the same time, South African mango exports are growing while the world imports are declining in Kuwait, United Arab Emirates and Saudi Arabian market. South Africa's performance in those markets can be regarded as gains in declining markets and should be viewed as achievement in adversity.

South African mango exports have declined faster than the world imports in the Italy, Netherlands, United States of America, United Kingdom, Switzerland and German markets. These are dynamic markets and South African performance should be regarded as an underachievement..

Figure 22: Growth in demand for the South African mangos in 2019



Source: TradeMap, ITC

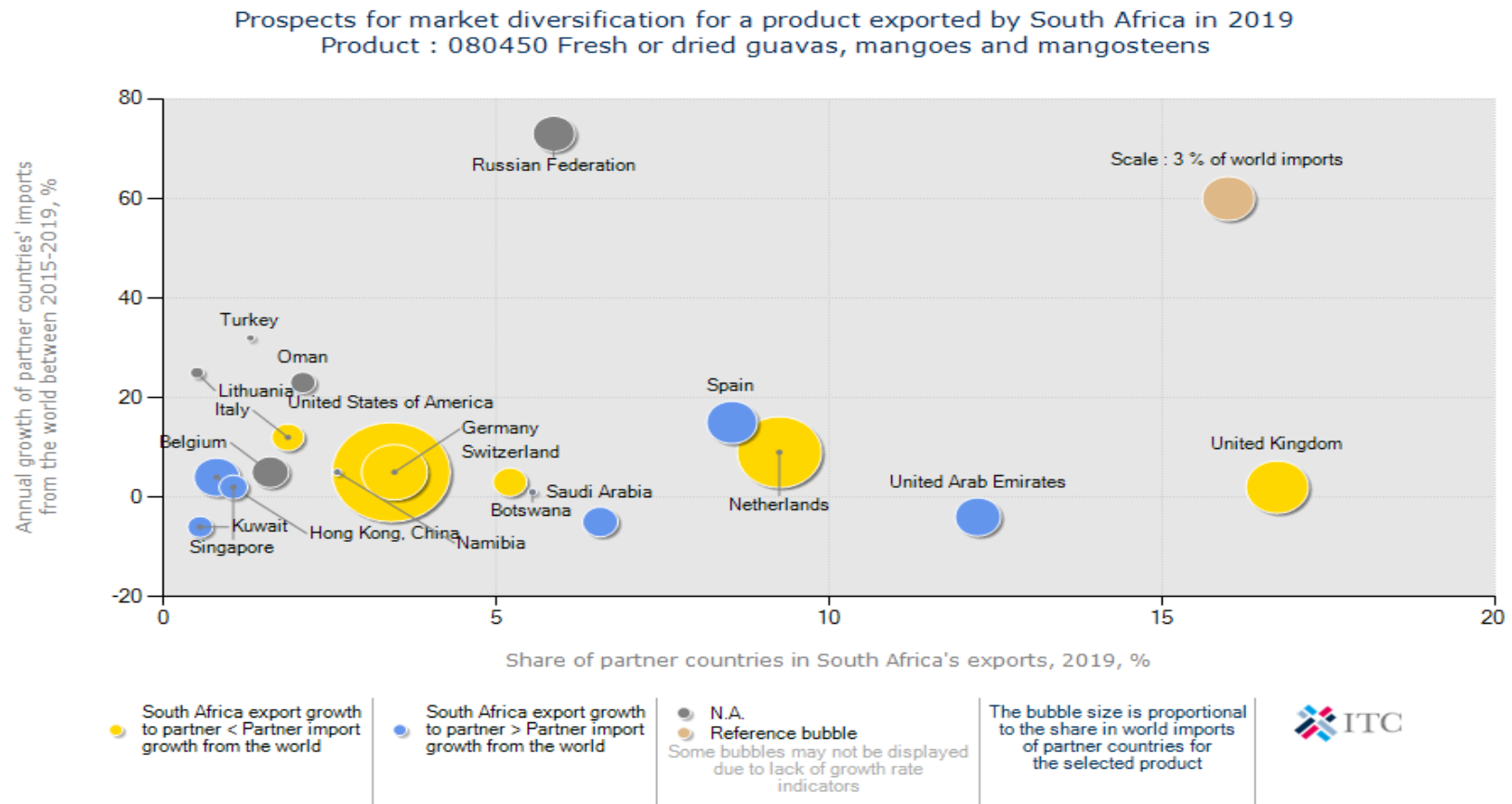
South African mangos' prospects for market diversification in 2019 are shown in Figure 23. United Arab Emirates, Ghana, United Kingdom, and Netherlands hold a bigger market share of South African mango exports.

In terms of market size, the China was the largest mango importer in 2019 with just over \$822 million worth of mango imports, or roughly 21.7% of the world mango market. Second was the USA with just over \$658 million worth of mango imports, or roughly 17.4% market share followed by Netherlands with just over \$334 million worth of mango imports, or roughly 8.8% market share.

Whilst three countries dominate world mango imports, it is interesting to note that countries like Italy and Lesotho have experienced higher annual growth rates in value in terms of mango imports from 2015 – 2019. Italy experienced an annual growth rate of 68%. Second was Lesotho with 20% annual growth rate. Even though growth by all these mentioned countries has been off a relatively lower base, these countries represent possible lucrative markets for South African mango producers.

It is also important to note that mango imports from the world to countries such as Mozambique and Malawi have declined from 2015 – 2019 and as a result those countries have recorded negative growth rates in mango imports.

Figure 23: South African mangos' prospects for market diversification in 2019



Source: TradeMap, ITC

## 5. MARKET ACCESS

Barriers to trade can be divided into tariff barriers (including quotas, ad valorem tariffs, specific tariffs and entry price systems) and non-tariff barriers (sanitary and phytosanitary measures, labels, etc.). The main markets for fruit (including mango) employ various measures, both tariff and non-tariff to protect the domestic industries. Whilst many of the non-tariff measures can be justified under the auspices of issues such as health and standards, the tariff measures are increasingly under the scrutiny of the World Trade Organization (WTO), and as such are gradually being phased out. Nevertheless, exporters need to be aware of all the barriers that they may encounter when trying to get their produce onto foreign shelves.

### 5.1 Tariffs, quotas and the price entry system

Tariffs are either designed to earn government revenue from products being imported or to raise the price of imports so as to render local produce more competitive and protect domestic industries.

Quotas can be used to protect domestic industries from excessive imports originating from areas with some form of competitive advantage (which can therefore produce lower cost produce). Tariffs and quotas are often combined, allowing the imports to enter at a certain tariff rate up to a specified quantity. Thereafter, imports from that particular region will attract higher tariffs, or will not be allowed at all. This phenomenon is referred to as tariff-rate quotas (TRQs).

The entry price system, which is used in many northern hemisphere markets, makes use of multiple tariff rates during different periods when domestic producers are trying to sell their produce, and lower the tariffs during their off-season. Alternatively, the tariff rate can be a function of a market price – if the produce enters at a price which is too low (and therefore likely to be too competitive), it qualifies for a higher tariff schedule.

Whilst tariff regulations can be prohibitive and result in inferior market access, it is often the non-tariff barriers that restrict countries like South from successfully entering the large developed markets. Many of these barriers revolve around different types of standards, including sanitary and phytosanitary standards (SPS), food health and safety issues, food labelling and packaging, organic produce certification, quality assurance and other standards and grades. Table 10 presents tariffs applied by the top-ten export markets to mangos originating from South Africa during 2019. The EU is treated as one country because all member states apply the same tariffs on mangos originating from South Africa. During 2019 the EU member states that featured in the list of the top-ten importers of South African mangos were the Germany, Netherlands, United Kingdom, and Belgium.

**Table 10: Tariffs applied by top-ten export markets to mangos (fresh or dried) from South Africa**

COUNTRY	HS CODE	PRODUCT DESCRIPTION	TRADE REGIME	APPLIED TARIFFS	TOTAL AD VALOREM EQUIVALENT TARIFF
European Union	0804500000	Fresh or dried guavas, mangoes and mangosteens	MFN duties (Applied)	0.00%	0.00%
Switzerland	08045000	Dattes, figues, ananas, avocats, goyaves, mangues et mangoustans, frais ou	Preferential tariff for SACU countries	0.00%	0.00%

COUNTRY	HS CODE	PRODUCT DESCRIPTION	TRADE REGIME	APPLIED TARIFFS	TOTAL AD VALOREM EQUIVALENT TARIFF
		secs: goyaves, mangues et mangoustans			
United States of America	08045040	Guavas, mangos, and mangosteens, fresh, if entered during the period September 1 through May 31, inclusive	Preferential tariff for GSP countries	0.00%	0.00%
	08045060	Guavas, mangos, and mangosteens, fresh, if entered during the period June 1 through August 31, inclusive	Preferential tariff for GSP countries	0.00%	0.00%
	08045080	Guavas, mangos, and mangosteens, dried	Preferential tariff for GSP countries	0.00%	0.00%
Ghana	0804501000	Fresh or dried guavas, mangos and mangosteens: Mangos	MFN duties (Applied)	20.00%	20.00%
	0804509000	Fresh or dried guavas, mangos and mangosteens: Other	MFN duties (Applied)	20.00%	20.00%
UAE	08045020	Mangos fresh or dried	MFN duties (Applied)	0.00%	0.00%
	08045030	Mangoes, fresh	MFN duties (Applied)	0.00%	0.00%
Canada	08045000	Fresh or dried guavas, mangoes and mangosteens	MFN duties (Applied)	0.00%	0.00%
Saudi Arabia	08045020	Mangoes, fresh or dried	MFN duties (Applied)	0.00%	0.00%
	08045030	Mangoes, fresh	MFN duties (Applied)	0.00%	0.00%
Botswana	08045010	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried: Guavas, mangoes and mangosteens: Fresh	Intra SACU rate	0.00%	0.00%
	08045090	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried: Guavas, mangoes and mangoesteens: Mangoesteens	Intra SACU rate	0.00%	0.00%

COUNTRY	HS CODE	PRODUCT DESCRIPTION	TRADE REGIME	APPLIED TARIFFS	TOTAL AD VALOREM EQUIVALENT TARIFF
Namibia	08045090	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried: Guavas, mangoes and mangosteens: Fresh	Intra SACU rate	0.00%	0.00%
Angola	08045000	Dattes, figues, ananas, avocats, goyaves, mangues et mangoustans, frais ou secs: Goyaves, mangues et mangoustans	MFN duties (Applied)	50.00%	50.00%

Source: MacMap, ITC

South Africa had a preferential trading agreement (PTA) with the European Union (EU) known as the Trade, Development and Cooperation Agreement (TDCA). The TDCA provided for the progressive introduction of a Free Trade Area (FTA). The EU is South Africa's main trading and investment partner. The FTA aimed to ensure better access to the Community market for South Africa and access to the South African market for the EU. The agreement covered around 90% of bilateral trade between the two parties and provided for the liberalisation of 95% of the EU's imports from South Africa within ten years and 86% of South Africa's imports from the EU in twelve years. In order to protect the vulnerable sectors of both parties, certain products were excluded from the FTA and others have been partially liberalised. For the EU, these are mainly agricultural products, while for South Africa, they are industrial products. The EU concluded negotiations on an Economic Partnership Agreement (EPA) in July 2014 with the SADC EPA Group comprising Botswana, Lesotho, Mozambique, Namibia, South Africa and Swaziland which broadened the scope of product coverage under TDCA agreement. The agreement is still going through legal scribing processes before final agreement between the two groups (SADC and EPA). In the meantime, tariffs in the TDCA are still applicable until the SADC/EPA agreement comes into effect as can be seen in Table 9, South African mangos had no preferential access into the EU market through the TDCA. South African mangos enter the Swiss market through preferential access for SACU member states. In the USA and Japan, South African mangos enter through the GSP system while Ghana imposes a 20% tariff on mangos imported from South Africa. South African mangos enter the UAE, Canada and Saudi Arabia markets duty-free. South Africa trade duty free in Lesotho, Botswana and Namibia through their oldest BLOC, SACU.

In reality, the tariffs are likely to be far lower for South Africa when considering the preferential agreements, but at the same time, most tariff structures are particularly complex, with quotas, seasonal tariffs and specific tariffs (an amount per unit rather than a percentage of value) all contributing to many different tariff lines and often higher duties payable than one might have anticipated initially. One must also bear in mind that most tariffs are designated to protect domestic industries, and as such are likely to discriminate against those attempting to compete with the domestic producers of that country.

## **5.2 European Union (EU)**

The EU has a seasonal tariff structures which are highest during the European peak harvesting seasons (the price entry system), quotas and specific tariffs, and various policies that allow, amongst other things, government organizations to purchase produce should supply rise too quickly (and thereby maintain prices), and then release this excess back onto the market as and when supply drops again. The immediate implication of these policies for South Africa is that an opportunity exists to supply mangos to the European market in the off season periods, as the produce will not compete directly with the European producers and thus would not be liable to a whole array of tariffs and other protective mechanisms.

There are other non-tariff barriers, including the phytosanitary and food health regulations laid down by the EU legislation, marketing standards and certificates of conformity, and the ever changing demand patterns of the EU consumers.

### **5.2.1 Tariff barriers**

The EU applies a system known as entry price system. With this system, the EU establishes an 'entry price' at which produce may enter the EU market, which is not only based on the market price for the current year (demand and supply) and for previous years, but also on the prices of the domestic producers (prices they need to maintain profitability). It is calculated by the regulatory authorities so that it can be used in combination with tariffs and quotas to aid EU's attempts at protecting its agricultural system. The entry price is the minimum price at which produce may enter the market. If the price of the produce is lower than its calculated price, it is liable to have duties imposed upon it over and above any duties/quotas it might originally attract. Agricultural duties are applied as follows:

- When the value of the imported party is between 92% and 94% of the entry price, 8% of the entry price will be added to the normal customs duty.
- When the value of the imported party is between 94% and 96% of the entry price, 6% of the entry price will be added to the normal customs duty.
- When the value of the imported party is between 96% and 98% of the entry price, 4% of the entry price will be added to the normal customs duty.
- When the value of the imported party is between 98% and 100% of the entry price, 2% of the entry price will be added to the normal customs duty.

There are tariffs applicable over and above the entry price tariffs, depending on the produce, where it originates from and whether that country has any preferential trading agreements with the EU.

### **5.2.2 Non-tariff barriers**

Non-tariff barriers can be divided into those that are mandatory and laid out in the EU Commission's legislature and those that are a result of consumers, retailers, importers and other distributors' preferences.

#### **5.2.2.1 Legal requirements**

##### **i) Product legislation: quality and marketing**



There are number of pieces of EU legislation that govern the quality of produce that may be imported, marketed and sold within the EU. They are as follows:

**General Food Law** which covers matters in procedures of food safety and hygiene (micro-biological and chemical), including provisions on the traceability of food (for example, Hazard Analysis and Critical Control Points, or HACCP), and it is laid out under regulation EC 178/2002.

**EU Marketing Standards** which govern the quality and labelling of fruit are laid out in the Common Agricultural Policy (CAP) framework under regulation EC 2200/96. These regulations include diameter, weight and class specifications, and any produce that does not comply with these standards will not be sold on the EU markets.

**Certificate of Conformity** must be obtained by anyone wishing to export and sell fruits in the EU, if that fruit falls under the jurisdiction of the EU marketing standards.

**Certificate of Industrial Use** must be obtained if the fruit is to be used in further processing.

**Maximum Residue Limits (MRL)** of various pesticides allowed.

#### ii) Product legislation: phytosanitary regulations

The international standard for phytosanitary measures was set up by the International Plant Protection Committee (IPPC) to protect against spreading of diseases or insects through the importation of certain agricultural goods. The EU has its own particular rules formalized under EC 2002/89, which attempts to prevent contact of EU of crops with harmful organisms from elsewhere in the world.

The crux of the directive is that it authorizes the Plant Protection Services to inspect large number of fruit products upon arrival in the EU This inspection consist of physical examination of a consignment deemed to have a level of phytosanitary risk, identification of any harmful organisms and certification of the validity of any phytosanitary certificate covering the consignment. If the consignment does not comply with the requirements, it may not enter the EU although certain organisms can be fumigated at the expense of the exporter.

#### iii) Product legislation: packaging

The EU Commission lays down rules for materials that come into contact with food and which may endanger people's health or bring about an unacceptable change in the composition of the foodstuffs. The framework legislation for this is EC 1935/2004. Recycling packaging materials are also emphasized under 94/62/EC, whereby member states are required to recycle between 50% and 65% of packaging waste. If exporters do not ship produce in packaging which is reusable, they may be liable for the costs incurred by the importing companies. Wood packaging is subject to phytosanitary controls and may need to undergo heat treatment, fumigation, etc.

#### 5.2.2.2 Non-legal requirements

To access the market, importers must not only comply with legal requirements set out above, but must also with market requirements and demands. For the most part, these revolve around quality and the perception of European consumers about environmental, social, health and safety aspects of both the products and

the production techniques. Whilst supplying fruit that complies with these issues may not be mandatory in the legal sense, they are becoming increasingly important in Europe and cannot be ignored by existing or potential exporters.

i) **Social accountability** is becoming important in the industry, not only amongst consumers, but also for retail outlets and wholesalers. The Social Accountability 8000 (SA 8000) certification is a management system based on International Labour Organization (ILO) conventions, and deals with issues such as child labour, health and safety, and freedom of association, and requires an on-site audit to be performed annually. The certificate is seen as necessary tool for accessing any European market successfully.

ii) **Environmental issues** are becoming increasingly important with European consumers. Consumer movements are lobbying against purchasing non-environmentally friendly or non-sustainable produce. To this end, both governments and private partners have created standards (such as ISO 14001 and EUREGAP) and labels to ensure that produce adhere to particular specifications.

Although eco-labels (for example, the EU Eco-label, the Netherlands Milieukeur, the German Blue Angel and the Scandinavian White Swan) are voluntary, they can afford an exporter a marketing edge, as consumers wishing to purchase environmentally sound produce demand products that are easily recognizable.

Another important emerging label is Fairtrade, and includes those labels offered by Max Haavelaar Foundation, TransFair International and the FLO (Fairtrade Labelling Organization). Recently a 'universal' logo was adopted based on international fair trade standards developed by FLO, which covers amongst other things, minimum quality and price, various processing requirements, compensation of small farmers that covers sustainable production and living standards, and contracts that allow for long term planning and development.

### **5.2.2.3 Consumer health and safety requirements**

Increasing consumer conscience about health and safety issues has prompted a number of safety initiatives in Europe, such as EUREPGAP on good agricultural practices (GAP) by the main European retailers, the international management system of HACCP, which is independently certified and required by legislation for European producers as well as food imported into Europe (EC 852/2004), and the ISO 9000 management standards system (for producers and working methods) which is certified by the International Standards Organization (ISO).

## **5.3 United States of America (USA)**

### **5.3.1 Tariff barriers**

South African exporters have completely free access to the USA markets under the Generalized System of Preference (GSP), the GSP for LCDs (Least Developed Countries) or the African Growth and Opportunity Act (AGOA). South African exporters must always compare with what Chile (the main supplier of fruit to the USA and South Africa's potential rival) must pay in terms of tariff duties when exporting fruit to the USA. Chile's access to the USA fruit market is considered to be highly preferential under its own Preferential Trade Agreement (PTA).

### **5.3.2 Non-tariff barriers**

The USA's phytosanitary regulation is conducted by Animal and Plant Health Inspection Service (APHIS), which is divided into nine sub-sections. Plant Protection and Quarantine (PPQ) and Veterinary Services (VS) are responsible for issuing permits for commodities and determining whether a commodity can be imported. The Policy and Program Development (PPD) division works with both these divisions in determining long term plans and procedures.

Some products can get pre-clearance from international Services (IS) personnel stationed in the country of origin, either at exporting terminals or at site inspections. The PPQ's main focus is to prevent the spread of diseases and pests into the USA's agriculture resources, and it has personnel stationed at all airports, seaports and border stations that check imported cargo and oversee the quarantine process. Exporters or importers must make a request to export/import a commodity, provide as much information as possible on the product, its region of origin and its status that is whether there are restrictions or regulations governing that particular product from that particular region before a permit is issued, along with the conditions of importation (disinfection treatment) or mitigation measures. Denials can be challenged and governments and companies can request a change in the status of a prohibited commodity (an investigation must be performed by the PPQ scientific team), as long as sufficient conditions have changed or a risk assessment has not been conducted within the last 10 years.

Most approved commodities can enter with inspection alone, but some may have to undergo mitigating measures including post-harvest treatments (hot/cold temperature treatments, irradiation or fumigation, depending on the requirements and which particular treatment is least harmful). The establishment of specifically and maintained pest-free areas in a country (which obviously requires extensive co-operation between the country's plant health services and APHIS IS division) or systems approaches (field surveys, random inspections or various onsite treatments).

In addition to phytosanitary regulations, the USDA Food Safety Inspection Services (FSIS) regulates sanitary practices in the packing of food products, while the Food and Drug Administration (FDA), which is part of the US Department of Health, regulates packaging and labelling. The HACCP protocol is used extensively. The USDA quality standards for fruits and vegetables provide basis for domestic and international trade and promote efficiency in marketing and procurement.

## **6. DISTRIBUTION CHANNELS AND LOGISTICS**

There are roughly three distinct sales channels for exporting fruits. One can sell directly to an importer with or without the assistance of an agent (usually larger, well established commercial operations). One can supply fruits combined, which will then contract out importers/marketers and try to take advantage of economies of scale and increased bargaining power. At the same time combined fruits might also supply large retail chains. One can also be a member of a private or cooperative export organization which will find agents or importers and market the produce collectively. Similar to combined fruits, an export organization can either supply wholesale market or retail chains, depending on particular circumstances. Export organizations will wash, sort and package the produce.

They will also market the goods under their own name or on behalf of the member, which includes taking care of labelling, bar-coding, etc. Most of the time, export organizations will enter into collective agreements with freight forwarders, negotiating better prices and services (more regular transport, lower peak season

prices, etc.). Some countries have institutions that handle all the produce (membership compulsory) and sell only to a restricted number of selected importers.

Agents will establish contacts between producers/export organizations and buyers in the importing country, and will usually take between 2% and 3% commission. In contrast, an importer will buy and sell his/her own capacity, assuming the full risk (unless on consignment). They will also be responsible for clearing the produce through customs, packaging and assuring label/quality compliance and distribution of the produce. Their margins lie between 5% and 10%. The contract importers of fruit combines market and distribute the produce of the combines, clear it through customs and in some cases treat and package it.

Only few exporters have long term contracts with wholesale grocers who deliver directly to retail shops, but with the increasing importance of standards (EurepGap, etc.) and the year round availability of fruit, the planning of long term contractual relationship is expected to increase.

## **7. LOGISTICS**

### **7.1 Mode of transport**

The transport of fruits falls into two categories namely ocean cargo and air cargo. Ocean cargo takes much longer to reach the desired location but costing considerably less. The choice of transportation method depends, for most parts on the fragility of the produce and how long it can remain relatively fresh. With the advent of technology and container improvements, the feasibility, cost and attractiveness of sea transport have improved considerably. With the increased exports by South Africa, the number and the regularity of maritime routes have increased. These economies of scale could benefit South Africa if more producers were to become exporters and take advantage of the various ports which have special capabilities in handling fruit produce (for example Durban's new fruit terminal).

### **7.2 Cold chain management**

Cold chain management is crucial when handling perishable products, from the initial packing houses to the refrigerated container trucks that transport the produce to the shipping terminals, through to the storage facilities at these terminals, onto actual shipping vessels and containers, and finally on to the importers and distributors that must clear the produce and transport it to the markets/retail outlets. For every 10 Degree Celsius increase above the recommended temperature, the rate of respiration and ripening of produce can increase twice or even thrice. Related to this are increasing important traceability standards which require an efficient controlled supply chain and internationally accepted business standards.

### **7.3 Packaging and marking requirements**

Packaging can also play an important role in ensuring safe and efficient transport of a product and conforming to handling requirements, uniformity recyclable material specifications, phytosanitary requirements, proper storage needs and even attractiveness for marketing purposes.

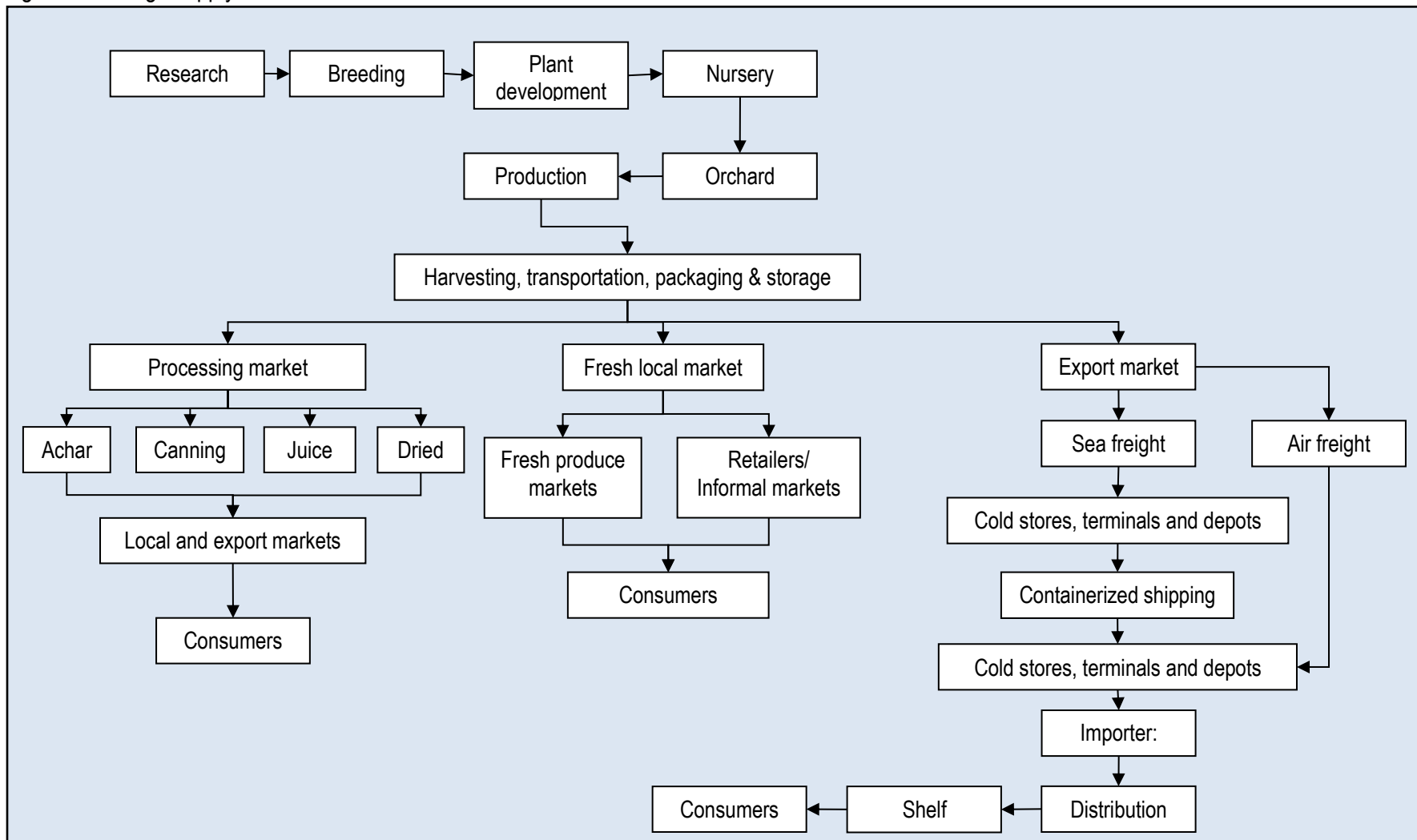
The business panel of any carton (including printed carton labels) should comply with the requirements as established by the EU or any other regulations that are specified by a target market. Producers are advised to present their designs to the Perishable Products Export Control Board (PPECB) before they can order any cartons from a manufacturer. The following is normally required:

- Class I or II
- Fruit type
- Carton depth
- Country of Origin: "Produce of South Africa"
- Complete address of exporter or producer
- Name of variety
- Content of carton: "14 x punnets or bags"
- PUC or PHC code: Registered producer – or Pack House Code with DAFF
- Date code
- Food safety accreditation number: Global Gap, Nature's Choice registration number, etc.

## **8. MANGO SUPPLY VALUE CHAIN**

A typical South African mango supply value chain is illustrated in Figure 24. The supply value chain consists of researchers who research and breed cultivars suitable to the South African environment. Mangos are produced in orchards. After harvesting, mangos are processed, sold locally through NFPMS, retailers and informal markets for fresh consumption, or exported. Processing entails slicing and canning, achar manufacturing, juice making and drying. The processed output is then sold both in the local and export markets.

Figure 24: Mango supply value chain



## 9. BUSINESS OPORTUNITIES AND CHALLENGES

The processing industry (achar, a green pickled mango, mango puree for different mango juices and dried fruit) is developing at a rapid rate. The mango industry is currently facing the following challenges.

### 9.1 Climate

Due to the cyclical drought/rain periods (5 to 10 years), mangos planted in different localities do not produce the same quality results. In dry cycles the wet areas close to the escarpment have good quality with low disease pressure and good yields. During wet cycles, areas further from the escarpment, dry areas experience less disease pressure. Higher rainfall causes higher disease levels of Anthracnose and Soft Brown Rot. Low lying areas with extended periods of night time temperatures below 8C are unfavourable for fruit set with most cultivars. Wind plays an important role on the spreading of diseases like Bacterial Black Spot. Climatic phenomena like El Niño and La Niña create periods of under or oversupply of mangos on the markets, due to their influence on production i.e. rain (storm), drought damage and hot or cold temperatures during flowering.

The ideal planting would therefore be in a windless, low rainfall area, with night time temperatures of 10-15C and daytime temperatures of 20-35C, with sufficient underground or canal water supply systems for irrigation.

### 9.2 Diseases

There are numerous diseases, which cause problems for the mango producers of South Africa, but this review will deal with those that cause major economic losses.

The two main diseases causing serious economic losses and threatening the future existence of many South African mango producers are Bacterial Black Spot and Soft Brown Rot. Production areas with high wind incidence are susceptible to Bacterial Black Spot and areas with high rainfall are susceptible to Soft Brown Rot. Anthracnose (*Colletotrichum gloeosporioides*) also causes serious economic losses but grading of fruit at pack houses with symptoms of pre-harvest Anthracnose (typical tear stain black spotted marks) and Bacterial Black Spot (small black spots with cracks), make these diseases less of an economic loss problem in the marketplace.

To control mango diseases application technology is very important to ensure maximum fruit cover at minimal chemical cost. Timing of applications coupled to timely follow up after heavy rainfall incidence is necessary to achieve control of pathogens. SAMGA recommends to producers to replace 20% of their total planting every third year, which ensures that maximum tree age is 15 years. This is very important for growing areas with higher rainfall resulting in more disease related problems. Pruning of unnecessary growth on the inside of trees together with cutting of windows to allow for spray penetration are essential with cultivars that have dense foliage. To maintain tree height and tree width according to the spray rigs technical capabilities are essential management tools.

### 9.3 Pests

The major pest problems, which restrict South African producers from exporting to new major markets, are mango weevils and fruit flies.

Mango weevil (*Sternochetus mangiferae*) is found in most of the southern continent countries and is listed as a major pest in Brazil, Australia, India and South Africa. From November onwards the weevil females lay

their eggs on the peel of the fruit. They then bite into the peel next to the eggs, which causes sap to exude from the peel and to cover the eggs from natural enemies. These bite marks can be observed as small black marks on the fruit, which can be observed with (10 x) magnification hand lenses. Once egg laying has occurred spraying with a suitable insecticide must commence, within a four to seven day period.

Mango fruit flies namely Natal (*Ceratitis Rosa*), Mediterranean (*Ceratitis capitata*) and Marula (*Ceratitis cosyra*), all cause problems for mangos. Females lay their eggs under the peel of the fruit where they develop into larvae that feed on the fruit and secrete enzymes causing fruit to rot. With ideal weather conditions the full life cycle of the fruit flies is  $\pm$  21 days. Monitoring with Census type M3 traps and determination of the threshold values will indicate when baiting with protein hydrolysate and suitable insecticides must commence to control these insects.

Integrated Pest Management (IPM) is a requirement to meet environmental standards required by the market. An entomologist from South Africa (Labuchagne *et al.*, 1996) identified and imported a predator beetle *Cybocephalus binotatus* Grouvelle (Coleoptera:Nitidulidae), of scales *Aulacaspis tubercularis* Newstead (Homoptera:Cecidomyiidae), from India. This predator is presently being introduced to the commercial industry for marketing. The IPM compatibility of chemical insecticides with insect predators in South Africa is being investigated by (Greef *et al.*, 1999).

#### **9.4 Disease resistant cultivars**

The most important cultivars planted in South Africa are Tommy Atkins, Sensation, Kent, Heidi, Keitt and Zill. Sensation and Zill are cultivars, which are losing their acceptability to consumers in Europe. Zill does not transport well and good external colour is only found in certain growing areas of South Africa. Sensation has got good external colour but internal maturity is variable within a single carton. Heidi is a cultivar developed in South Africa and is in high demand by South African consumers for its taste. Heidi does not travel well, is susceptible to cold damage and gives problems with fruit set in certain growing areas in South Africa.

Consumer preference studies conducted in Europe show that Tommy Atkins is not the preferred mango when tasting tests are conducted. Tommy Atkins has got good external colour, travels well but is much lower on the tasting list than both Kent and Keitt. Overproduction of Tommy Atkins by South Africa and its competitors is creating an oversupply in Europe specifically during the month of January. Consumers in Europe prefer Haden because of the external colour and taste, then Kent and Keitt for their taste and finally Tommy Atkins. Kent and Keitt are considered to be green coloured mangos and are not as attractive as Tommy Atkins but consumers who appreciate the taste, prefer these green skins above Tommy Atkins. Disease resistance is an important production decision. Cultivars regarded as disease resistant not always purely because of inherent genetic resistance but sometimes due to early maturity. Cultivars listed in order of disease resistance are as follows Zill, Tommy Atkins, Heidi, Sensation, Kent and Keitt.

#### **9.5 Nutrition**

Nutrition is very important in determining quality of fruit externally and internally. Internal breakdown of fruit flesh with arrival on overseas markets, correlated with higher rainfall incidence in the production area, emphasizes the need for research to solve this complex subject. Different cultivars react differently to the same nutrition applications. Therefore individual treatment is required.

#### **9.6 Competitiveness**



South Africa has an exclusive marketing window from the third week in February to the end of March. Un-coordinated marketing leads to an oversupply situation, with importers not knowing what volumes to expect, or how to plan their promotions together with supermarkets. The South African season stretches from January to the middle of March. During January volumes from Brazil, Peru, Ecuador and Venezuela place a lot of pressure on the market. The West coast of Africa with countries like the Ivory Coast, Gambia, Burkina Faso and Mali supply fruit from the middle of March onwards.

Discussion and co-operation between South African producers, European importers and possibly other competitor countries supplying major volumes could alleviate possible oversupply market situations. South African producers have decided to summarise weekly consignment notes, which include information of the destination, cultivar and count volumes. This information is made available to all exporters who then inform their respective importers of the expected volumes. In the future it will pay competitor countries to make their information available to their importers on a weekly basis, so that an oversupply situation is avoided, thereby sustaining prices, which are sufficient to keep producers in production.

Presently the South African industry is experiencing a difficult economic period because of poor returns to producers, as a result of some of the factors covered in this article. The wellbeing of producers will be determined by the effort of the researchers, marketing agents and processors who together with producers will forge and secure the future of the mango industry. Researchers will have to find solutions for problems causing serious economic losses, with ever increasing pressure from consumer groups who demand safe produce. The South African Industry, marketing agents and processors will have to develop new markets and promote brand or generic advertising to create consumer awareness and increase consumption. Market agents will have to take responsibility for the quality of the export and local market mangos and insist on certain protocols for export producers. Active support with promotions and advertising will be essential in order to maintain market share in an increasingly competitive market, not only for fresh produce but also for a host of other consumer items. The producers will have to produce mangos within the required size range, with good external colour, correct internal maturity and of good quality. Furthermore, a flow of information to the importers and consumers will provide the key for demand and sustainable long-term profitable production.

## **10. ACKNOWLEDGEMENTS**

The following industries/organizations are acknowledged.

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**10.5 International Trade Centre (ITC)**

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