

# A PROFILE OF THE SOUTH AFRICAN AQUACULTURE MARKET VALUE CHAIN

2013

Directorate Marketing  
Private Bag X 15  
Arcadia  
0007  
Tel: 012 319 8455/6  
Fax: 012 319 8131  
Email: [MogalaM@daff.gov.za](mailto:MogalaM@daff.gov.za)  
[www.daff.gov.za](http://www.daff.gov.za)



agriculture,  
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Department:  
Agriculture, Forestry and Fisheries  
REPUBLIC OF SOUTH AFRICA

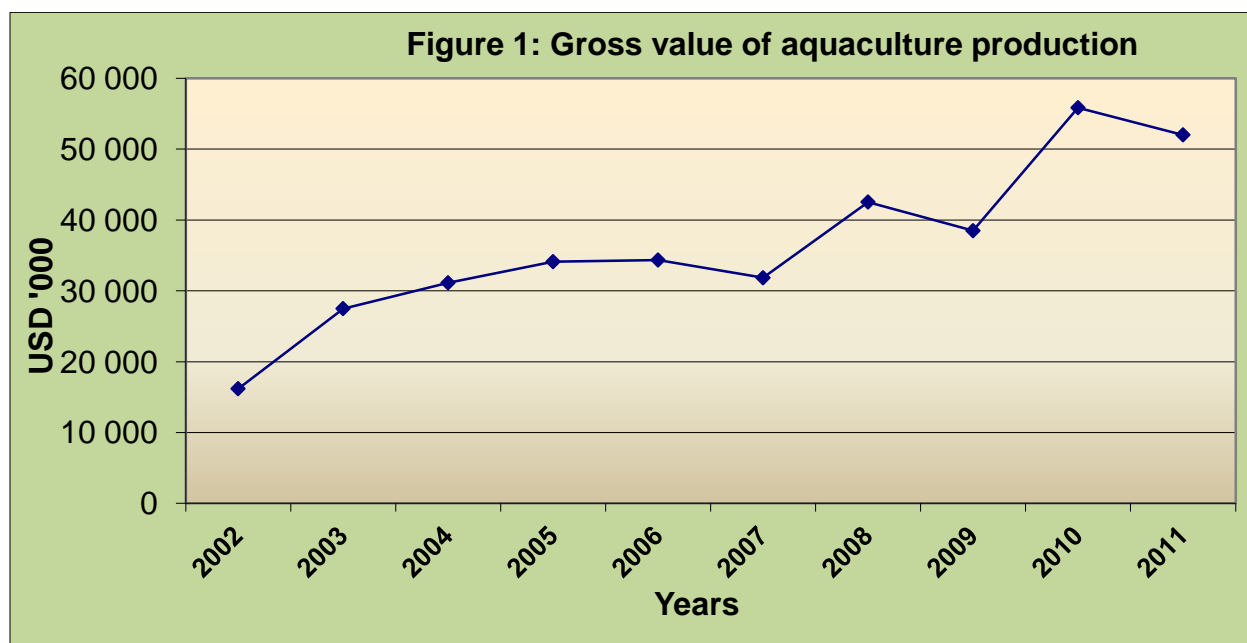
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## 1. DESCRIPTION OF THE INDUSTRY

Aquaculture in South Africa consists mainly of freshwater species such as Rainbow trout, brown trout, Koi carp, crocodiles, Ornamental fish, African catfish, Mozambique and Nile tilapia, Marron and Waterblommetjies; and marine species such as abalone, white prawns, oysters, seaweeds, Spanish & Brown mussels, Dusky & Silver Kob; yellow tail, Atlantic Salmon, Clownfish, White Margined Sole, West & East coast rock Lobster, Scallop and Blood Worm. Freshwater species are generally farmed in re-circulating systems, earth ponds or raceways whereas the marine molluscs are farmed on raft or long-lines, and abalone are produced in tanks through which marine water is pumped. The technology and services are well established for species such as trout, crocodiles, catfish, abalone, prawns, oysters, mussels while still lacking for species such as eel, tilapia, cob, tuna and seaweed. Abalone is the big success story of South African aquaculture. This species is highly priced in south-eastern Asia and the wild population has been radically reduced through poaching.

The gross value of production of aquaculture is dependent on the quantity and species produced and prices received by farmers. The trend in the gross value follows mainly the pattern of prices since the industry is characterized by volatile prices. The gross value of aquaculture production is illustrated in Figure 1.



Source: FAO

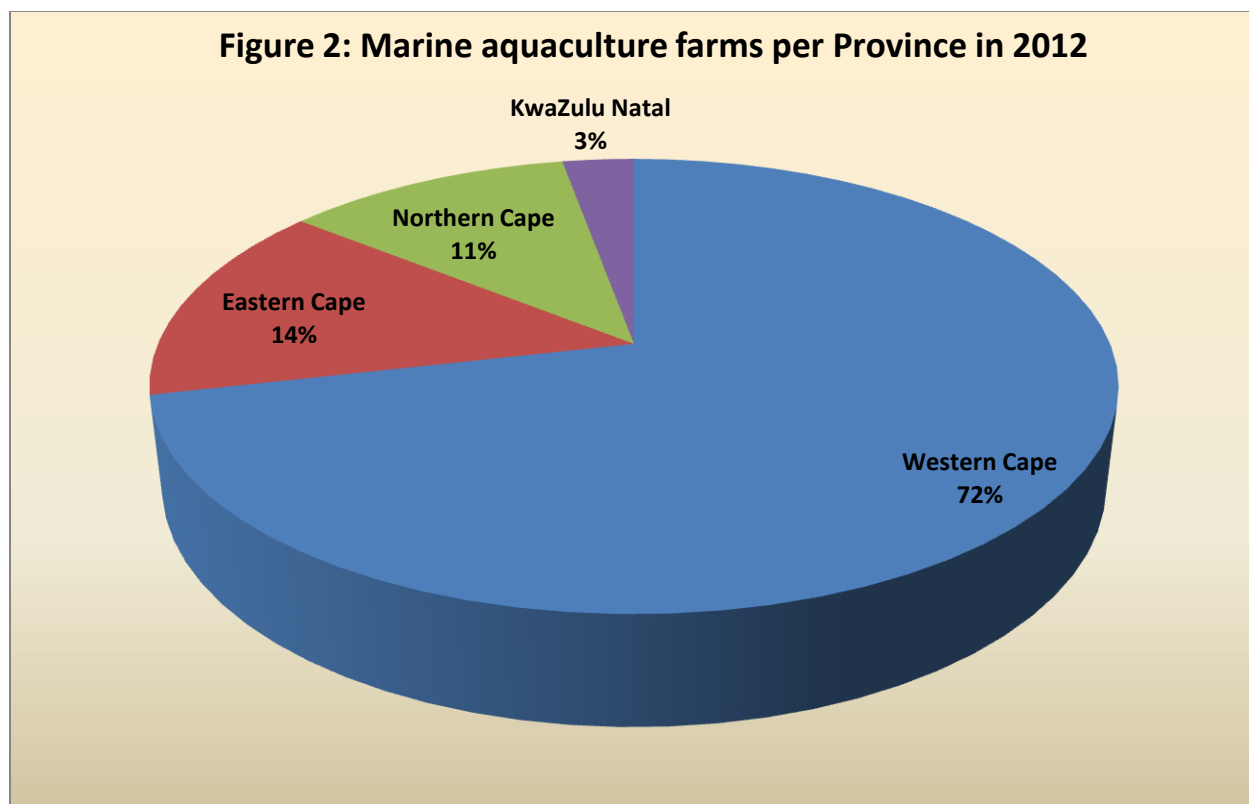
The gross value of aquaculture production has been moving at an increasing trend with minor fluctuations during the period under review. This might be due to the fluctuations in price of aquaculture products. It experienced a new peak of 43 421 000 US\$ in 2010. Generally there is an increase of 221% during 2011 compared to 2002. There were some major declines during 2002 and 2007.

### 1.1. Production areas

Aquaculture in South Africa is divided into freshwater and marine aquaculture. Freshwater fish culture is severely limited by the supply of suitable water. The most important areas for the production of fresh water species are at Limpopo, Mpumalanga Lowveld and Northern KwaZulu–Natal. Trout is farmed along the high mountain in Lydenburg area, KwaZulu–Natal Drakensberg and the Western Cape. Other freshwater species cultivated on a small scale include catfish, freshwater crayfish and tilapia species.

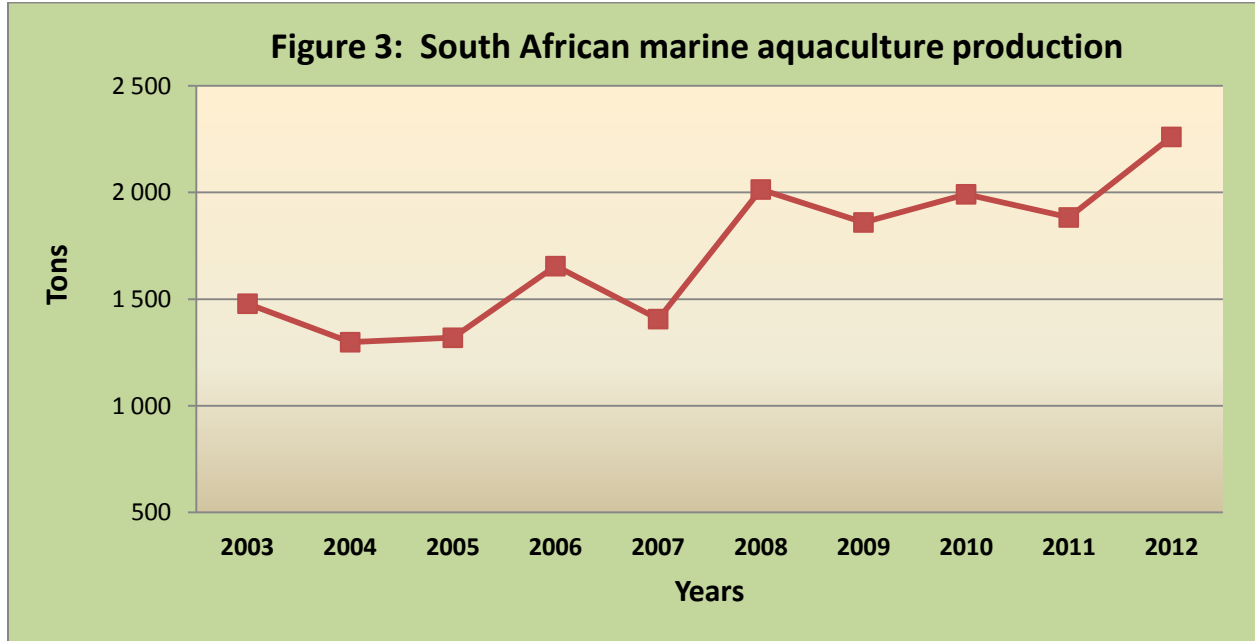
Marine aquaculture is a fast developing sector, with a focus on mussels, oysters, abalone, seaweeds and prawns. Of these, mussel farming is the best established. Abalone culture is now well established, centered in the Hermanus area on the Cape south coast. There is also an experimental offshore farm (cage culture) off Gansbaai for salmon.

Figure 2 below shows the share of marine aquaculture farms per province in 2012.



Source: Aquaculture Technical Services; DAFF

Figure 2 above shows that Western Cape has most farms of marine aquaculture accounting to 72% of South African marine farms, followed by Eastern Cape by 14%, Northern Cape by 11% and KwaZulu Natal by 3%.

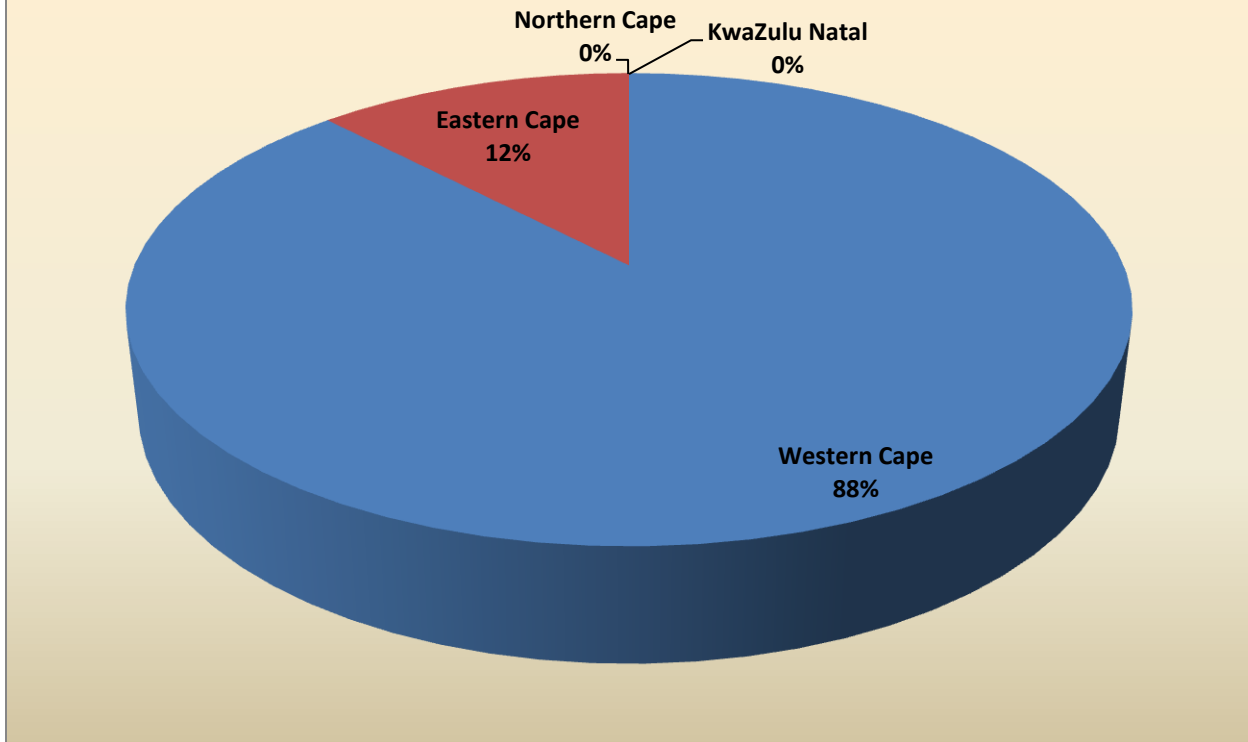


Source: Aquaculture Technical Services; DAFF

Production of aquaculture has been fluctuating during the periods 2003 to 2012. Aquaculture production reached the new peak of 2,261 tons in 2012. There is an increased of 53% of aquaculture products produced during 2012 compared to 2003 and increased by 61% when compared to the production in 2007 which was the lowest. The slight decrease in 2009 was due to the non operational of the South African finfish and prawns farms.

The following figure shows the production of marine aquaculture per province.

**Figure 4: Marine aquaculture production per province in 2012**



Source: Aquaculture Technical Services; DAFF

Figure 4 above clearly shows that marine aquaculture production dominated in the Western Cape accounting for 88% with its tonnage making up 1 986 tons, followed by Eastern Cape with 12% (275 tons) and Northern Cape and KwaZulu Natal accounting for less than a percent.

### 1.3. Employment

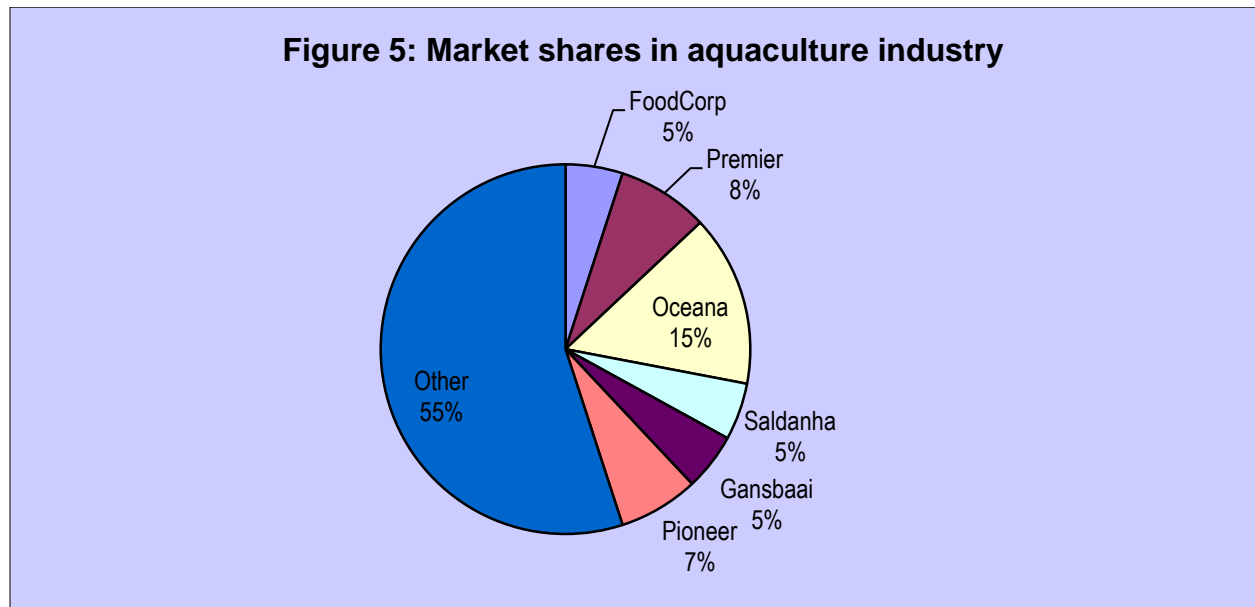
South African marine aquaculture industry employed 1 607 employees on permanent basis and just a few are employed on temporary basis. Majority of jobs was created by Abalone sub-sector accounting for 1 219 employees followed by Oyster sub-sector with 157 people, Finfish sub-sector accounted for 152 employees and Mussel sub-sector accounted for 79 job opportunities.

## 2. MARKET STRUCTURE

SA aquaculture products are marketed both locally and internationally, depending on the specific species. The abalone industry markets the bulk of their stock in Asia. The trout industry markets the bulk of their products locally. Products such as crocodile skins are exported, while many of the other experimental species such as Dusky cob is marketed mainly on the local market.

## 2.1. Domestic market and prices

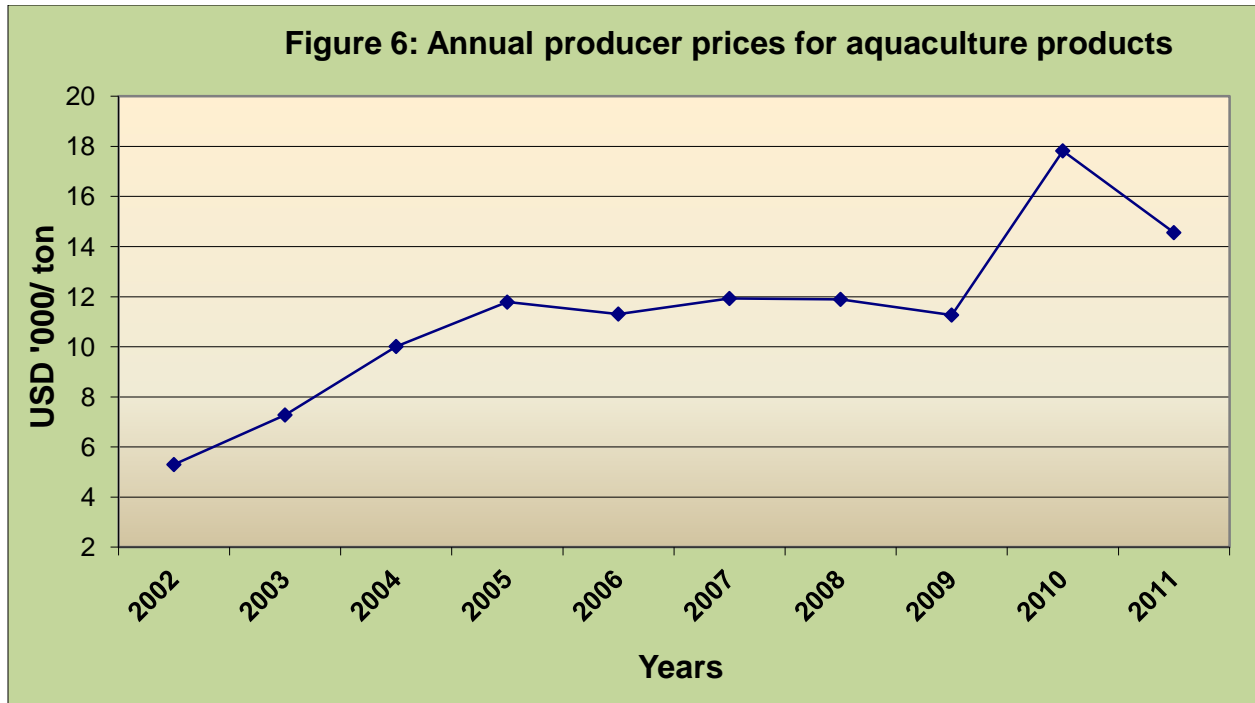
There are more than 355 processing companies registered with Marine and Coastal Management. Six companies command 45% share in the processing sector and the remaining 55% were taken up by the large number of small fishing companies. Figure 6 illustrates Market Shares in the Aquaculture Industry.



Source: Competition Commission

Figure 5 shows that Oceana holds the greatest share of the market in the aquaculture processing industry followed by Premier (8%) and Pioneer (7%).

Most of the aquaculture species like abalone are traded internationally. Therefore, the demand and supply conditions in the domestic international market influence domestic prices directly. Figure 6 below show the price movement of aquaculture products from 2002 to 2011.



Source: FAO

Figure 6 shows that producer price of aquaculture products moved at an increasing trend with minor decreases during the past decade. Its deep decline was experienced in 2002 (5 000 US\$/ ton) and its peak was experienced in 2010 (13 000 US\$/ ton). The Peak during 2010 might have been influenced by the continuous increase in demand of aquaculture products.

## 2.2. Import – Export Analysis

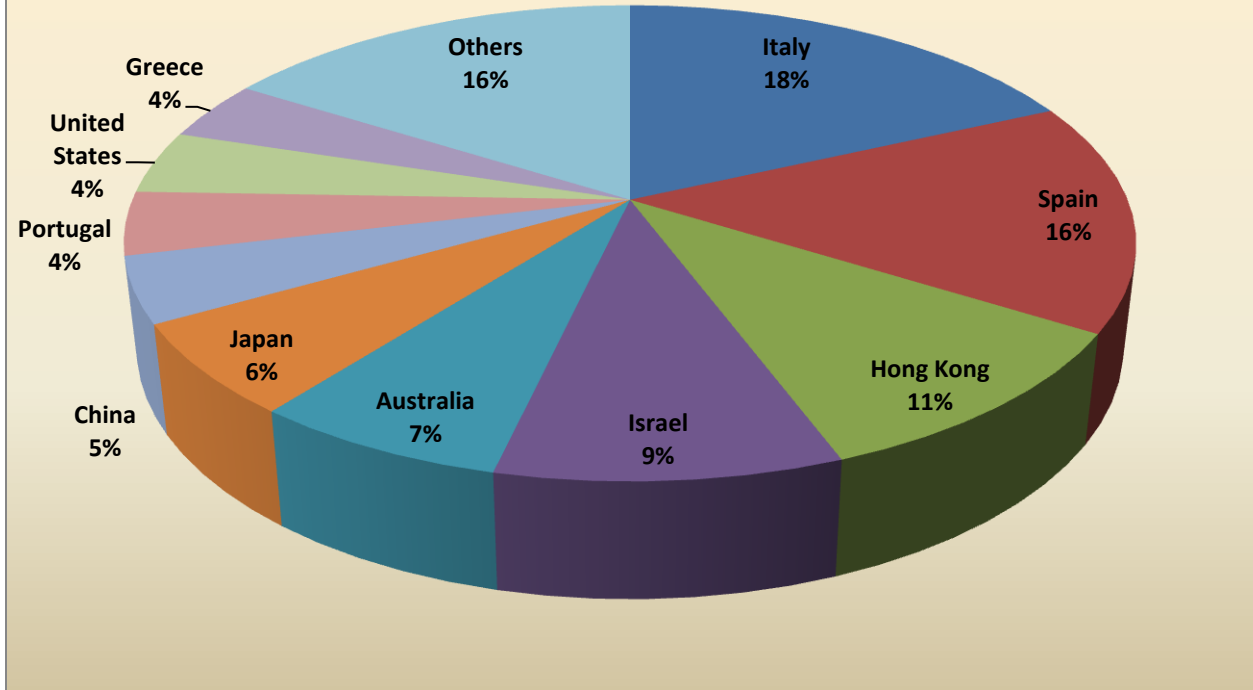
Import and Export of aquaculture products are combined with capture production and traded as fish and aquatic invertebrates.

### 2.2.1. Exports of fish and aquatic invertebrates.

South Africa exported 102 million kilograms of fish and aquatic invertebrates in 2012 yielding an export value of R 3.6 billion. Figure 7 shows the main destination of South African fish and aquatic invertebrates' exports in 2012.



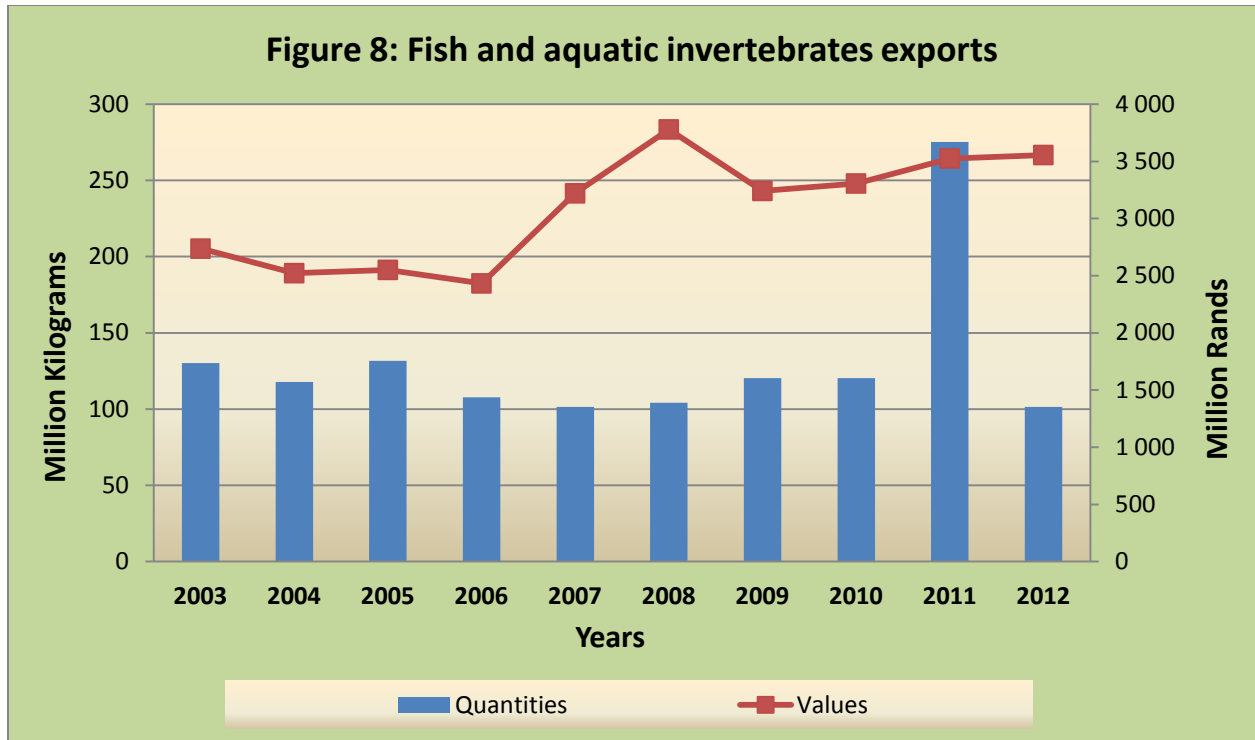
**Figure 7: Fish and aquatic invertebrates export destinations in 2012**



Source: Quantec EasyData

The above figure shows that the main destination of South African fish and aquatic invertebrates in 2012 was Italy commanding 18% followed by Spain with 16% of South Africa's fish and aquatic invertebrates' exports. Hong Kong was third highest commander with only 11% share of South Africa's exports, followed by Israel, Australia and Japan with a share of 9%, 7% and 6% respectively.

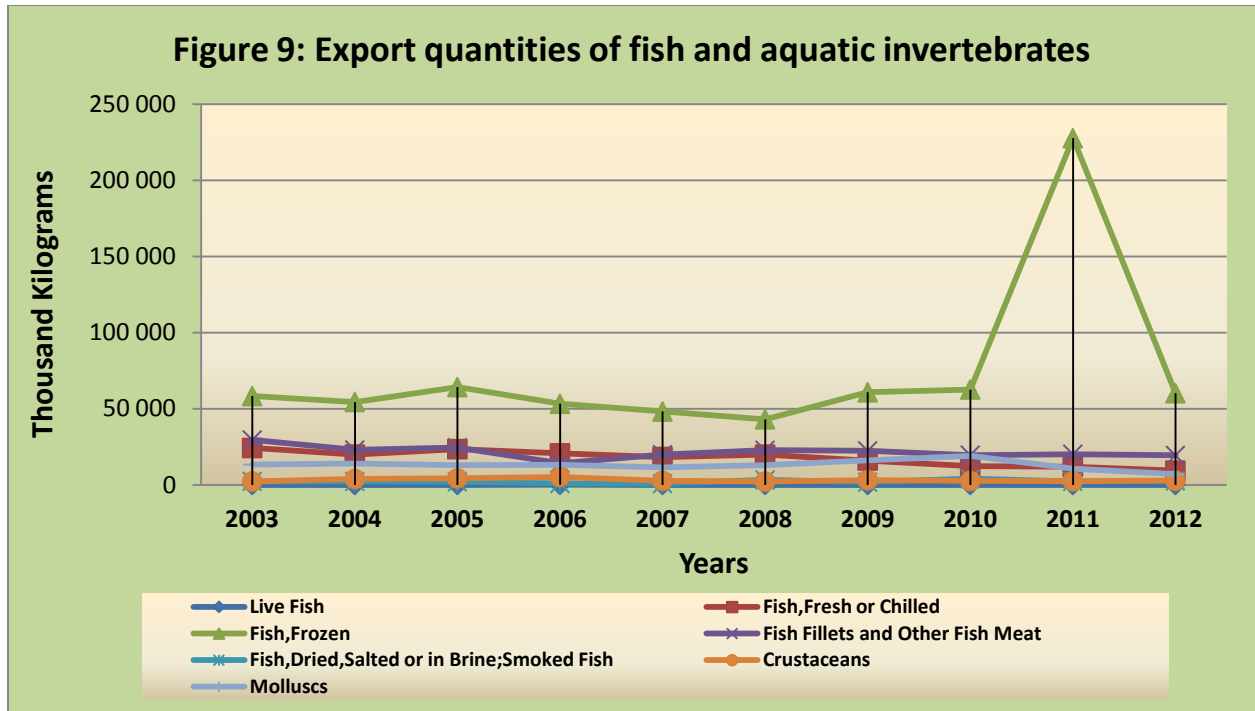
Figure 8 shows the export of fish and aquatic invertebrates from 2003 to 2012.



Source: Quantec EasyData

Figure 8 shows that exports of fish and aquatic invertebrates fluctuated throughout the decade and it also shows that it was less profitable to export because large quantities were exported with less value from 2002 to 2010 and it was profitable in 2011. The highest value of R 6.5 billion was experienced in 2008. There was an increase of 113% in quantity exported and an increase of 20% in value in 2011 compared to 2002.

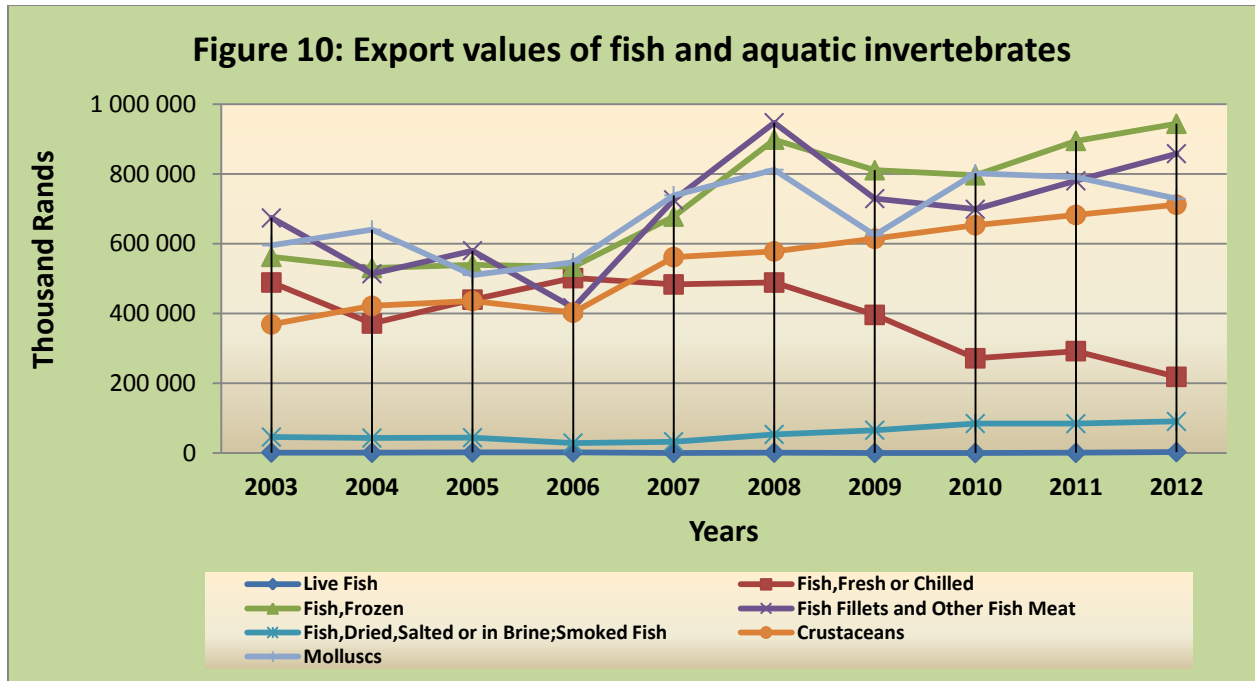
Figure 10 below shows the different fish and aquatic invertebrates' products that were exported from 2002 to 2011.



Source: Quantec EasyData

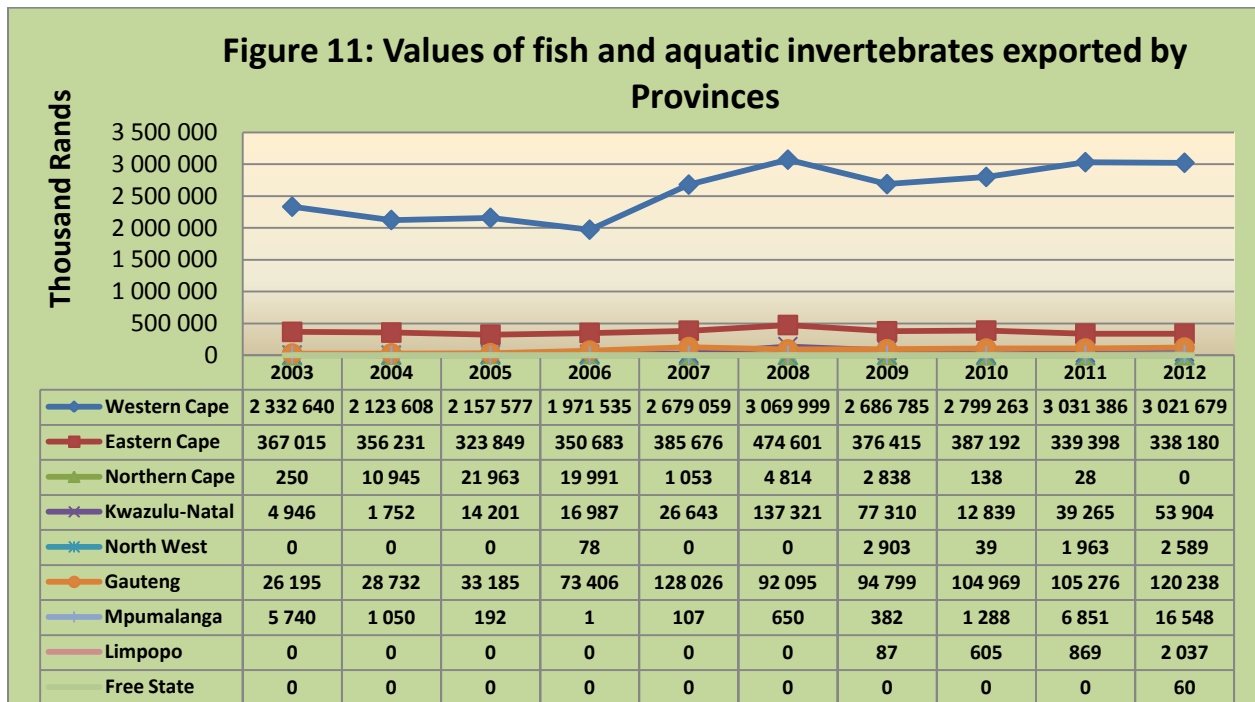
From Figure 9 it is evident that frozen fish was the main exported product from South Africa over the past ten years than any other fish and aquatic invertebrates' products. The second most exported product was fish fillets & other fish meat which commanded the second level followed by fresh or chilled fish then molluscs during the period under review. The least exported product was live fish with the total of 284,998 kilograms for a 10 year period.

Figure 10 to 20 show the export values of fish and aquatic invertebrates from regions.



Source: Quantec EasyData

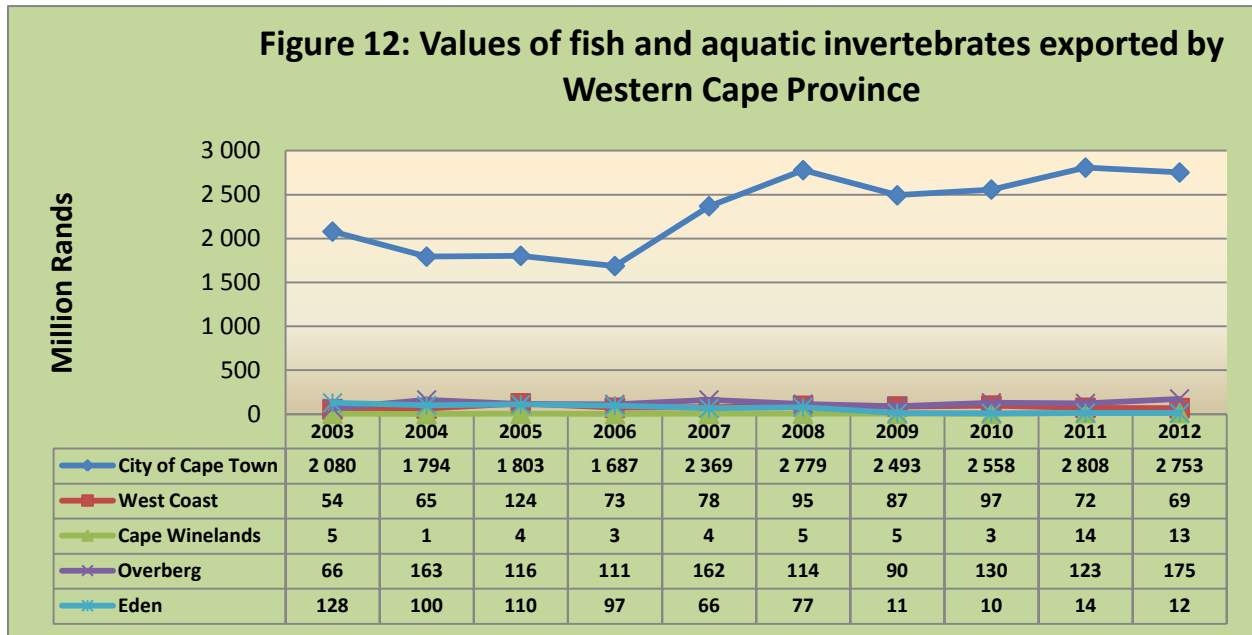
Figure 10 above shows that frozen fish commanded the greatest values of South African exports during 2003 to 2012 commanding a total R7.2 billion followed by fish fillet by R6.9 billion then mollusks by R6.8 billion. Live fish and dried, salted or smoked fish commanded the lowest value of R13 million and R573 million respectively during the past decade.



Source: Quantec EasyData

Western Cape Province has recorded high export values of fish and aquatic invertebrates from 2003 to 2012. This is due to the fact that the western coast is more productive than other coastal and inland areas. The other factor is that Western Cape is the main exit point of exports. Regular fish and aquatic invertebrates' exports have also been recorded from Eastern Cape, KwaZulu–Natal, Gauteng and Mpumalanga Provinces. Irregular exports were recorded in Northern Cape, Limpopo, North West and Free State Provinces.

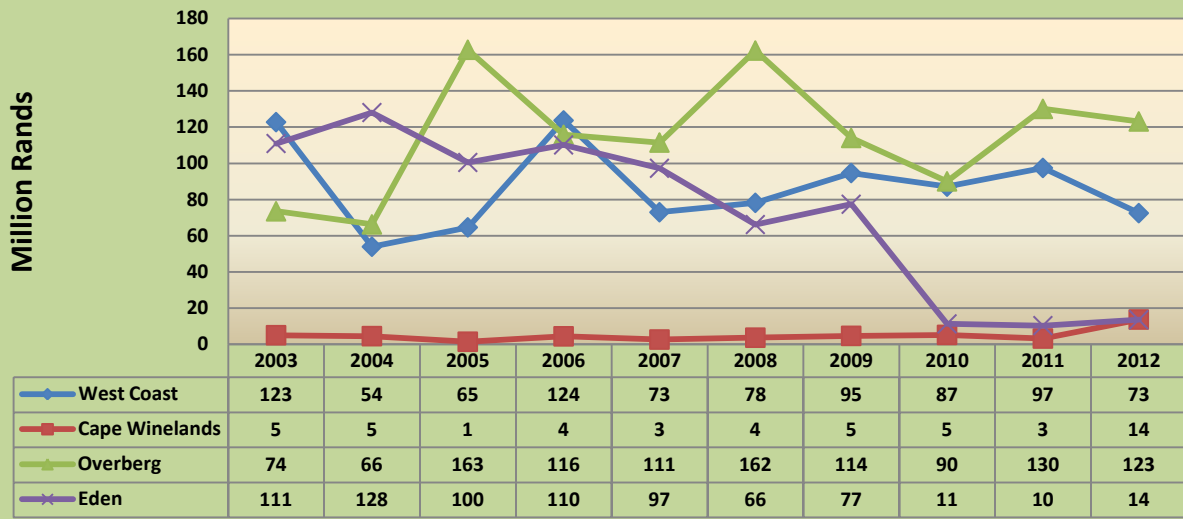
**Figure 12: Values of fish and aquatic invertebrates exported by Western Cape Province**



Source: Quantec EasyData

City of Cape Town metropolitan municipality in the Western Cape Province has dominated the export market with high values of fish and aquatic invertebrates throughout the period under review. This is due to the fact that it has many processing firms and it is also the main exit point of exports from South Africa. The second greatest commander of fish and aquatic invertebrates exported values was Overberg district municipality. Fish and aquatic invertebrates' exports have also been regularly recorded in the West Coast, Cape Winelands and Eden district municipalities.

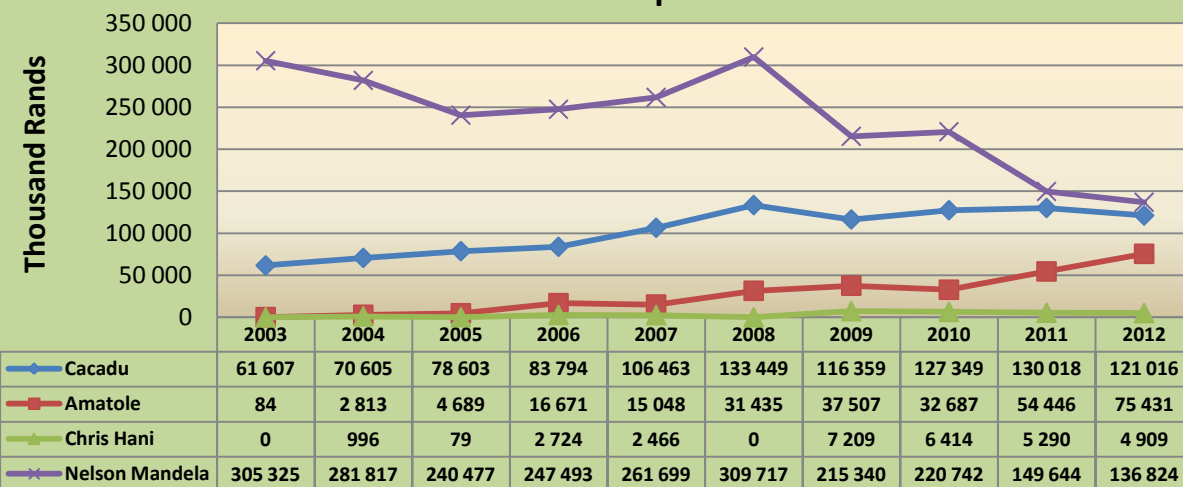
**Figure 13: Values of fish and aquatic invertebrates exported by Western Cape excluding City of Cape Town Metropolitan Municipality**



Source: Quantec EasyData

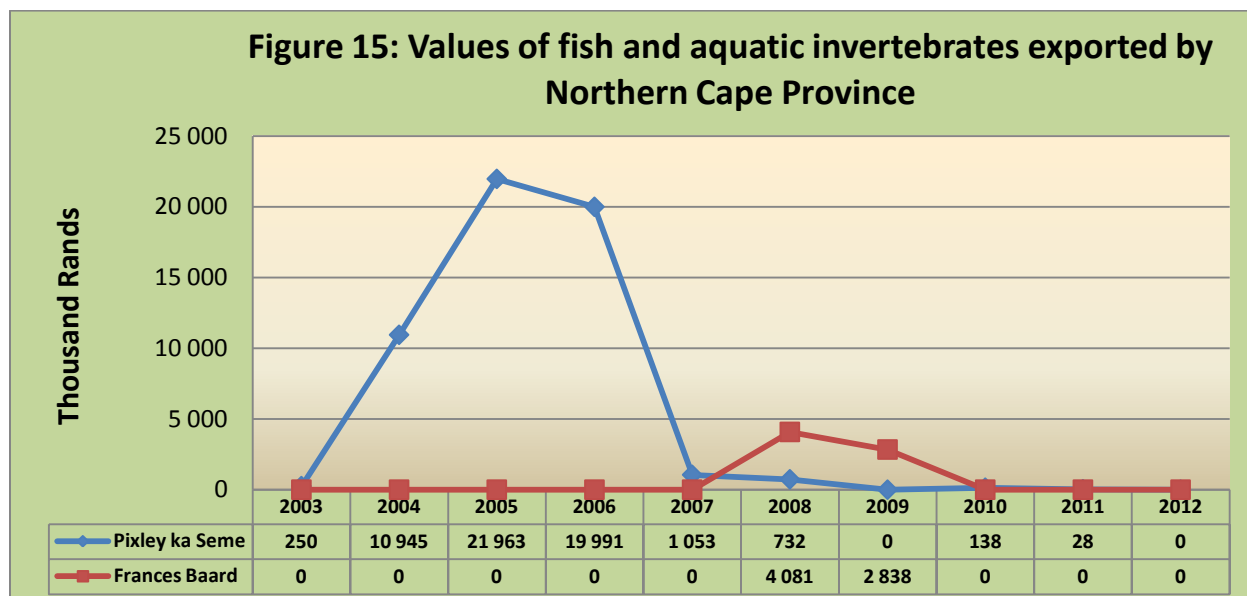
Export values of fish and aquatic invertebrates from Western Cape Province excluding City of Cape Town Metropolitan municipality, shows fluctuations among West Coast, Cape Winelands and Eden district municipalities. West Coast district municipality commanded the highest value during the periods 2003 and 2006, Eden district municipality commanded the highest value in 2004 only and Overberg district municipality recorded the highest value during 2005 and 2007 to 2012. This shows that Overberg dominated the market during the past decade when City of Cape Town metropolitan municipality. Cape Winelands district municipality recorded minimal exports during the period under analysis.

**Figure 14: Values of fish and aquatic invertebrates exported by Eastern Cape Province**



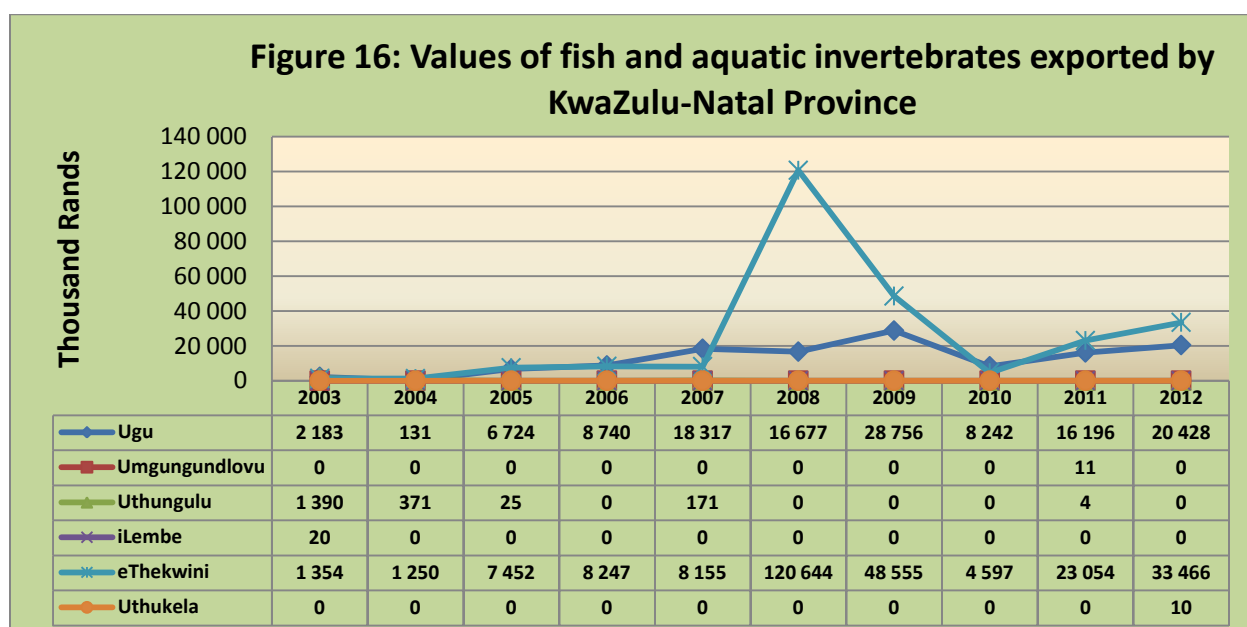
Source: Quantec Easy Data

Eastern Cape Province's export values of fish and aquatic invertebrates were mainly from Nelson Mandela metropolitan municipalities followed by Cacadu district municipality during the period under review. Amatole district municipality commanded minimal values of fish and aquatic invertebrates' exports while Chris Hani district municipality commanded fractional export values.



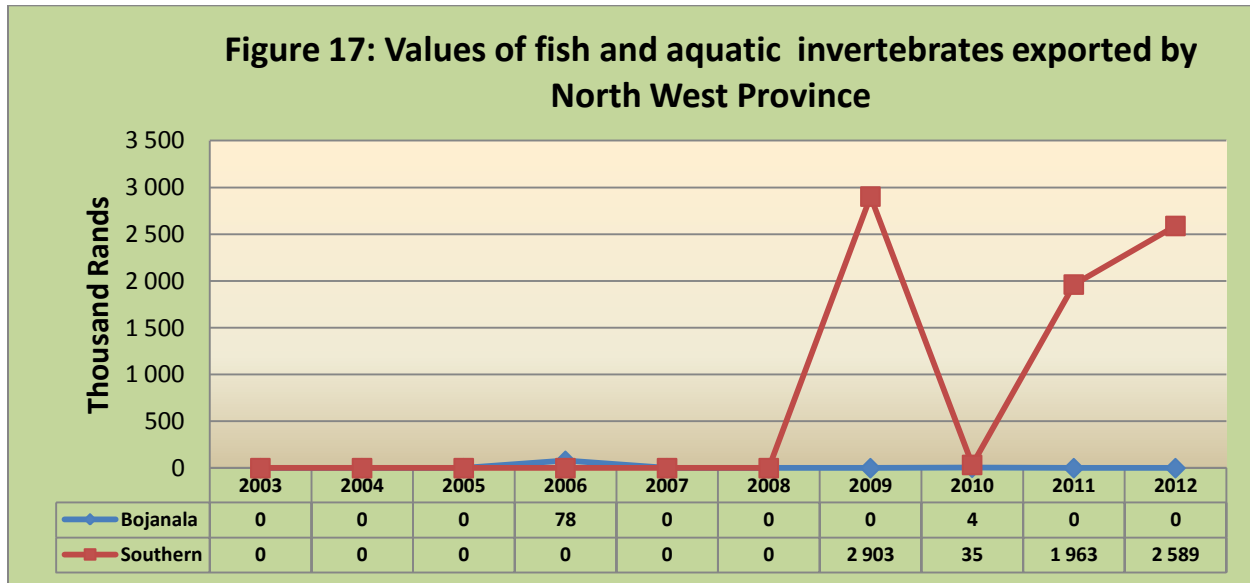
Source: Quantec EasyData

From Northern Cape Province, fish and aquatic invertebrates' exports were mainly from Pixley ka Seme which commanded the greatest values during 2003 to 2007. Frances Baard district municipality commanded the highest shares during 2008 to 2009 and diminished during other years. Other minimal export values from Pixley ka Seme were recorded during 2010 to 2011.



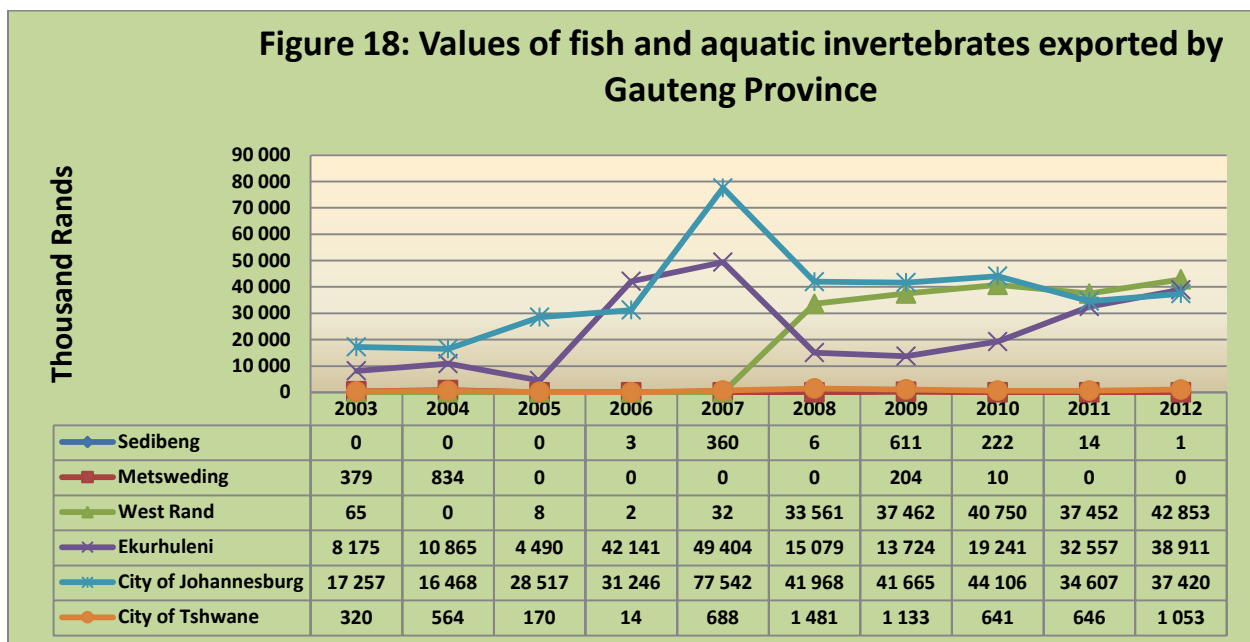
Source: Quantec EasyData

In KwaZulu Natal Province Ugu district municipality and eThekweni metropolitan municipality completed for the greatest share during the period under review. Ugu district municipality commanded the greatest shares during the periods 2003, 2006, 2007 and 2010 while eThekweni commanded the greatest shares during 2004-2005; 2008-2009 and 2011-2012. Irregular exports of fish and aquatic invertebrates in KwaZulu–Natal Province were recorded from Umgungundlovu, Uthungulu, iLembe and Uthukela district municipalities.



Source: Quantec EasyData

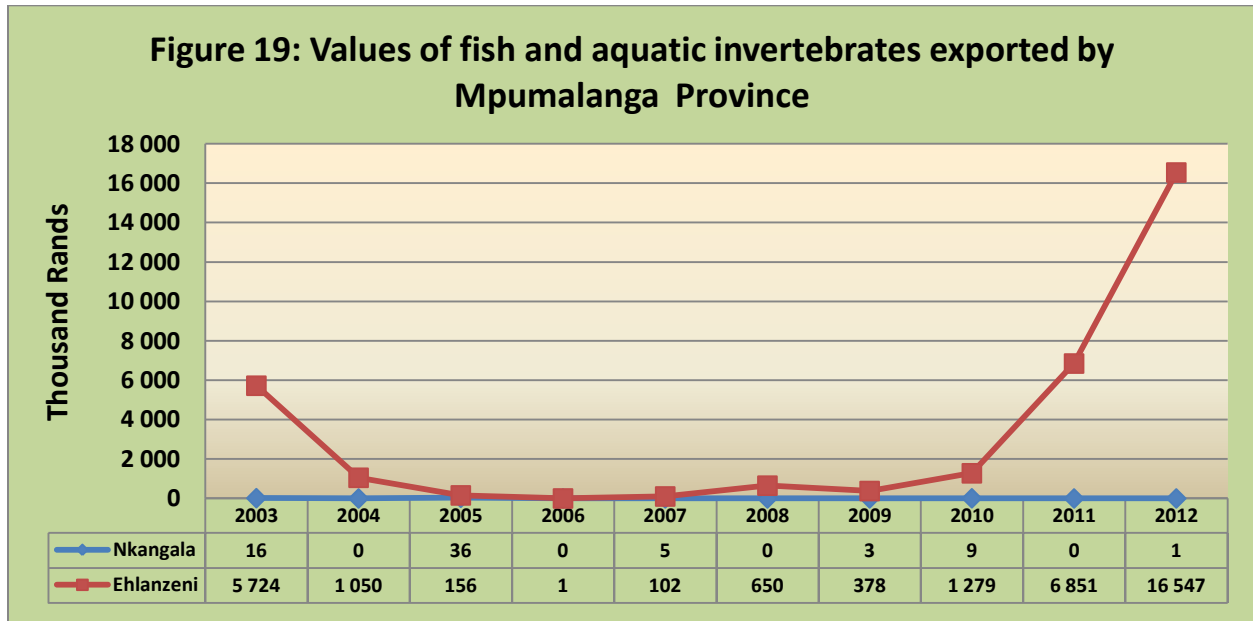
In the North West Province, intermittent exports were recorded from Bojanala and Southern district municipality. There were no records of exports within the Province from 2003 to 2005 and from 2007 to 2008. The greatest values were commanded by Southern district municipalities in 2009 and 2011-2012.



Source: Quantec EasyData



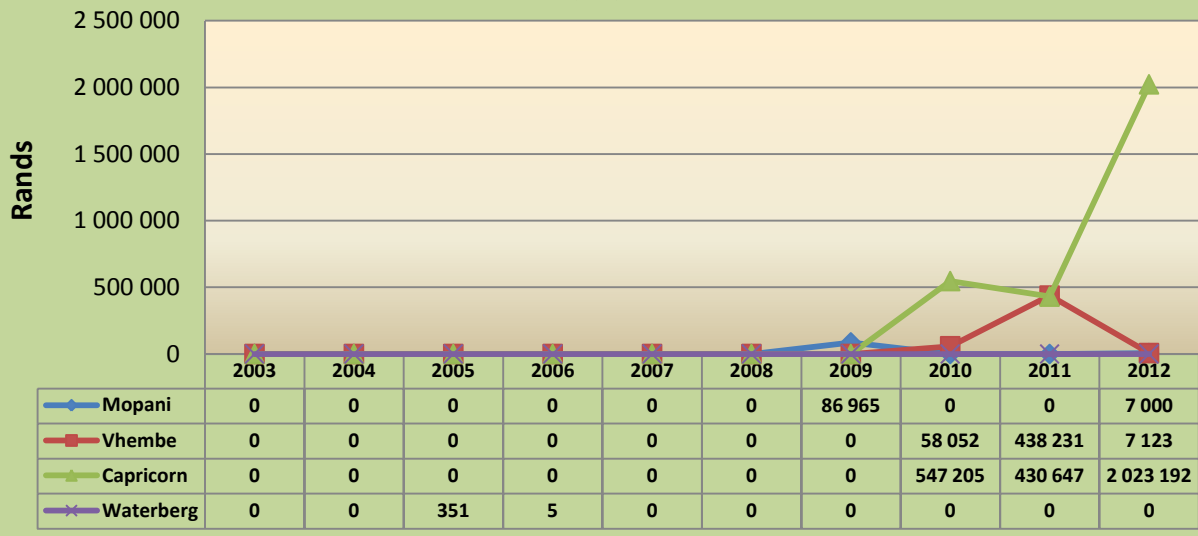
In Gauteng Province, high export values of fish and aquatic invertebrates were recorded from City of Johannesburg, Ekurhuleni district and West Rand metropolitan municipalities. The highest export value of R 77.5 million was recorded in 2007 from City of Johannesburg metropolitan municipality. City of Tshwane metropolitan municipality recorded regularly although while Sedibeng, Metsweding and West Rand recorded irregular export values.



Source: Quantec Easy Data

Mpumalanga province's export values of fish and aquatic invertebrates were mainly from Ehlanzeni district municipality from 2003 until 2012 with high a value of R 16 547 000 in 2012. Irregular and minimal export values were recorded from Nkangala district municipality.

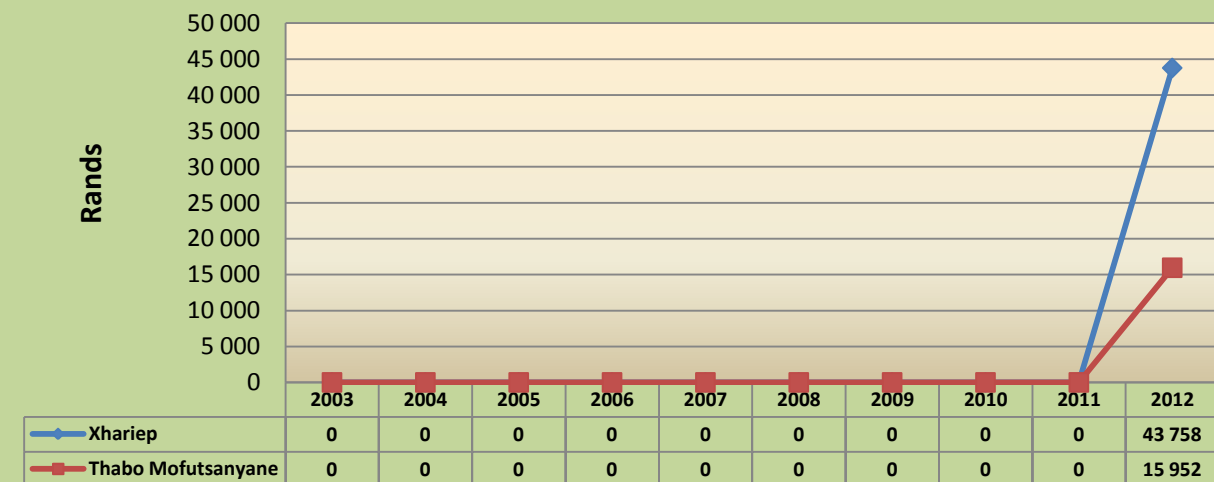
**Figure 20: Values of fish and aquatic invertebrates exported by Limpopo Province**



Source: Quantec EasyData

From Limpopo Province, the export values of fish and aquatic invertebrates were irregular, high values were recorded during 2010 and 2012. Mopani district municipality recorded exports 2009 and 2012, Vhembe and Capricorn district municipalities recorded from 2010 to 2012 while Waterberg district municipality recorded minimal exports values during 2005 only. This is a clear indication that Limpopo Province is not the main producing area of fish and aquatic invertebrates.

**Figure 21: Values of fish and aquatic invertebrates exported by Free State Province**



Source: Quantec EasyData

There were no export records of fish and aquatic invertebrates from Free State province during the past nine years (2003 to 2011). Free State Province showed some exports in 2012 from Xhariep and Thabo Mofutsanyane district municipalities. Xhariep district municipality received the value of R 43 758 and Thabo Mofutsanyane district municipality received R 15 952 in 2012.

## 2.2.2. Share Analysis

The shares of the various provinces to the total South African value of exports for fish and aquatic invertebrates are presented in Table 1.

**Table 1: Share of Provincial fish and aquatic invertebrates to the total RSA fish and aquatic invertebrates' exports (%)**

Years Provinces	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Western Cape	85.23	84.19	84.58	81.04	83.19	81.23	82.89	84.66	86.00	84.99
Eastern Cape	13.41	14.12	12.70	14.42	11.98	12.56	11.61	11.71	9.63	9.51
Northern Cape	0.01	0.43	0.86	0.82	0.03	0.13	0.09	0	0	0
Kwazulu-Natal	0.18	0.07	0.56	0.70	0.83	3.63	2.38	0.39	1.11	1.52
North West	0	0	0	0	0	0	0.09	0	0.06	0.07
Gauteng	0.96	1.14	1.30	3.02	3.98	2.44	2.92	3.17	2.99	3.38
Mpumalanga	0.21	0.04	0.01	0	0	0.02	0.01	0.04	0.19	0.47
Limpopo	0	0	0	0	0	0	0	0.02	0.02	0.06
Free State	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated from Quantec EasyData

Table 1 show that Western Cape Province commands the greatest share of South Africa's fish and aquatic invertebrates' exports value followed at a distant by Eastern Cape and Gauteng Provinces. Regular exports were also recorded from KwaZulu-Natal and Gauteng Provinces. Fractional exports were recorded in Free State, Mpumalanga, North West, Northern Cape and Limpopo Provinces. The export records from Free State Province were only in 2012 and accounted for less than a percent.

**Table 2: Share of district fish and aquatic invertebrates to the total Western Cape Provincial fish and aquatic invertebrates' exports (%).**

Years Districts	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
City of Cape Town	89.16	84.49	83.59	85.57	88.41	90.53	92.79	91.38	92.64	91.10
West Coast	2.31	3.04	5.73	3.70	2.92	3.08	3.24	3.48	2.39	2.28
Cape Winelands	0.20	0.07	0.21	0.14	0.14	0.15	0.20	0.12	0.45	0.45
Overberg	2.84	7.66	5.37	5.65	6.06	3.71	3.35	4.65	4.06	5.78
Eden	5.49	4.73	5.11	4.93	2.47	2.52	0.42	0.37	0.45	0.39
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated from Quantec Eas Data

City of Cape Town metropolitan municipality has commanded the greatest share of fish and aquatic invertebrates' exports value in the Western Cape Province during the period 2003 and 2012. City of Cape

Town metropolitan municipality commanded the highest export shares ranging from 83% to 93% throughout the period under analysis and the other few percentages were divided among West Coast, Cape Winelands, Overberg and Eden district municipalities.

**Table 3: Share of district fish and aquatic invertebrates to the total Eastern Cape Provincial fish and aquatic invertebrates' exports (%).**

Years Districts	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Cacadu</b>	16.79	19.82	24.27	23.89	27.60	28.12	30.91	32.89	38.31	35.78
<b>Amatole</b>	0	0.79	1.45	4.75	3.90	6.62	9.96	8.44	16.04	22.30
<b>Chris Hani</b>	0	0	0.02	0.78	0.64	0.00	2	1.66	1.56	1.45
<b>Nelson Mandela</b>	83.19	79.11	74.26	70.57	67.85	65.26	57.21	57.01	44.09	40.46
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated from Quantec EasyData

Nelson Mandela metropolitan municipality has commanded the greatest share of fish and aquatic invertebrates' exports value in the Eastern Cape Province during the period between 2003 and 2012 followed by Cacadu district municipality. Fractional export shares were recorded in Amatole and Chris Hani district municipalities.

**Table 4: Share of district fish and aquatic invertebrates to the total Northern Cape Provincial fish and aquatic invertebrates' exports (%).**

Years Districts	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Pixley ka Seme</b>	100	100	100	100	100	15.22	0.01	100	100	0
<b>Frances Baard</b>	0	0	0	0	0	84.78	99.99	0	0	0
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>0</b>

Source: Calculated from Quantec EasyData

Pixley ka Seme district municipality commanded 100% shares of fish and aquatic invertebrates' exports originating from the Northern Cape Province from 2003 to 2007 and again from 2010 to 2011. Frances Baard district municipality recorded minimal exports during 2008 and 2009. There were no exports records of fish and aquatic invertebrates from Northern Cape during 2012.

**Table 5: Share of district fish and aquatic invertebrates to the total KwaZulu–Natal Provincial fish and aquatic invertebrates' exports (%).**

Years District	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Ugu</b>	44.14	7.45	47.35	51.45	68.75	12.14	37.20	64.19	41.25	37.90
<b>Umgungundlovu</b>	0	0	0	0	0	0	0	0	0.03	0
<b>Uthungulu</b>	28.10	21.20	0.17	0	0.64	0	0	0	0.01	0
<b>iLembe</b>	0.39	0	0	0	0	0	0	0	0	0
<b>eThekwini</b>	27.37	71.34	52.48	48.55	30.61	87.86	62.80	35.80	58.71	62.08
<b>Uthukela</b>	0	0	0	0	0	0	0	0	0	0.02
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated from Quantec EasyData

In KwaZulu–Natal Province, high export shares of fish and aquatic invertebrates were recorded from eThekweni district municipality followed by Ugu district municipality. Fractional export shares were recorded from Umgungundlovu, Uthungulu, iLembe and Uthukela district municipalities. iLembe district municipality was less active during the period under review as it only commanded exports shares of 0.39% during 2003.

**Table 6: Share of district fish and aquatic invertebrates to the total North West Provincial fish and aquatic invertebrates' exports (%).**

Years Districts	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Bojanala	0	0	0	0	0	0	0	11.24	0	0
Southern	0	0	0	0	0	0	0	88.76	100	100
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated from Quantec EasyData

From North West Province, irregular exports of fish and aquatic invertebrates were recorded from Bojanala and Southern district municipalities. Southern district municipality recorded the highest exports shares from 2010 to 2012 and recorded 100% in 2011 and 2012 while Southern district municipality commanded 11% in 2010 only. There were no records of fish and aquaculture exports from 2003 to 2009.

**Table 7: Share of district fish and aquatic invertebrates to the total Gauteng Provincial fish and aquatic invertebrates' exports (%).**

Years Districts	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Sedibeng	0	0	0	0	0	0.01	0.65	0.21	0.01	0.00
Metsweding	1.45	2.90	0.00	0.00	0.00	0.00	0	0.01	0.00	0
West Rand	0.25	0.00	0	0.00	0	36.44	39.52	38.82	35.57	35.64
Ekurhuleni	31.21	37.82	13.53	57.41	38.59	16.37	14.48	18.33	30.93	32.36
City of Johannesburg	65.88	57.32	85.93	42.57	60.57	45.57	43.95	42.02	32.87	31.12
City of Tshwane	1.22	1.96	0.51	0.02	0.54	1.61	1.19	0.61	0.61	0.88
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated from Quantec EasyData

In Gauteng Province, high export shares of fish and aquatic invertebrates were recorded from City of Johannesburg metropolitan municipality followed by Ekurhuleni and West Rand district municipalities. Regular exports were also recorded from City of Tshwane metropolitan Municipality. Intermittent exports were recorded from Sedibeng and Metsweding district municipalities.

**Table 8: Share of district fish and aquatic invertebrates to the total Mpumalanga Provincial fish and aquatic invertebrates' exports (%).**

Years										
Districts	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Nkangala</b>	0.27	0	18.70	0	5.08	0	0.89	0.70	0	0.01
<b>Ehlanzeni</b>	99.73	100	81.30	100	94.92	100	99.11	99.30	100	99.99
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated from Quantec EasyData

During the period 2003 to 2012, Ehlanzeni district municipality commanded the greatest shares of fish and aquatic invertebrates' exports. Irregular exports were recorded in Nkangala district municipality. There were no exports records from Gert Sibande district municipality.

**Table 9: Share of district fish and aquatic invertebrates to the total Limpopo Provincial fish and aquatic invertebrates' exports (%).**

Years										
Districts	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Mopani</b>	0	0	0	0	0	0	0	0	0	0.34
<b>Vhembe</b>	0	0	0	0	0	0	0	9.59	50.44	0.35
<b>Capricorn</b>	0	0	0	0	0	0	0	90.41	49.56	99.31
<b>Waterberg</b>	0	0	0	100	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated from Quantec EasyData

Limpopo Province, recorded irregular exports shares of fish and aquatic invertebrates from Mopani, Vhembe, Capricorn and Waterberg district municipalities. Waterberg commanded a 100% share during 2005 and it was the only exporting municipality during same year. Other exports resumed in 2010 to 2012.

**Table 10: Share of district fish and aquatic invertebrates to the total Free State Provincial fish and aquatic invertebrates' exports (%).**

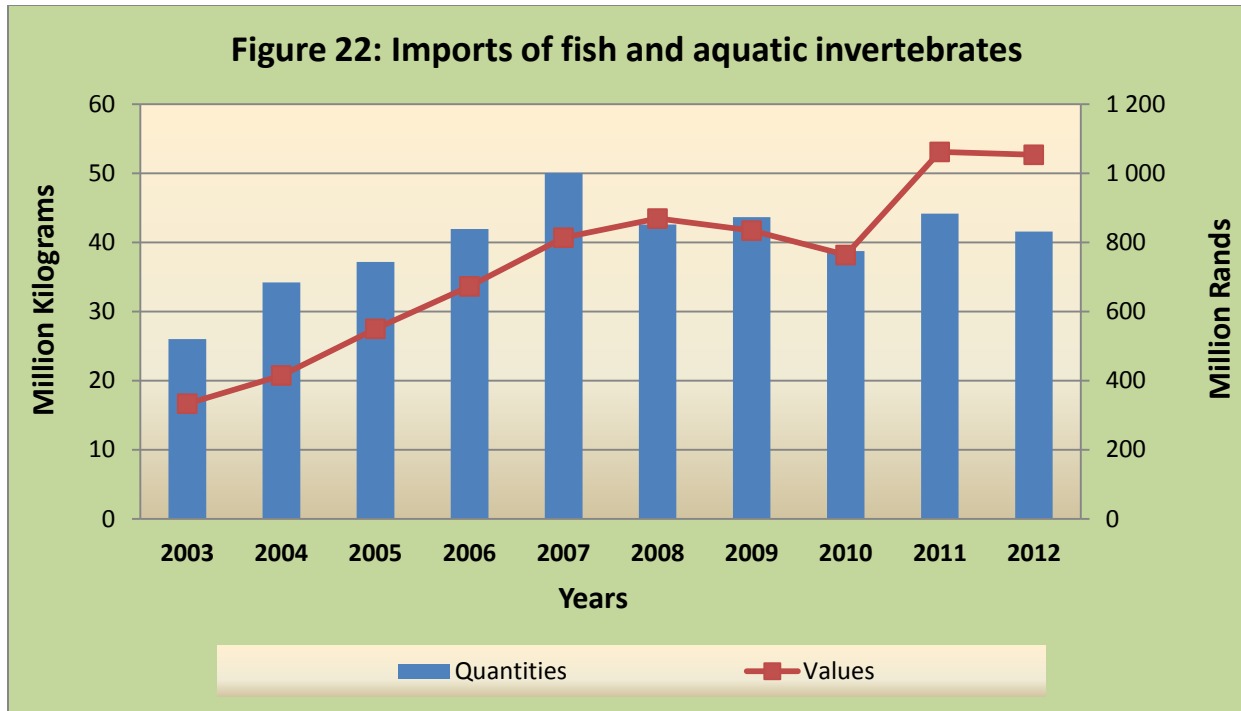
Years										
Districts	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Xhariep</b>	0	0	0	0	0	0	0	0	0	73
<b>Thabo Mofutsanyane</b>	0	0	0	0	0	0	0	0	0	27
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>

Source: Calculated from Quantec EasyData

There were no exports records from Free State Province from 2003 to 2011. In 2012 Xhariep district municipality commanded the highest shares of 73% and Thabo Mofutsanyane district municipality commanded 27% shares.

### 2.2.3. Imports.

Figure 21 below show the imports of fish and aquatic invertebrates from 2003 to 2012.

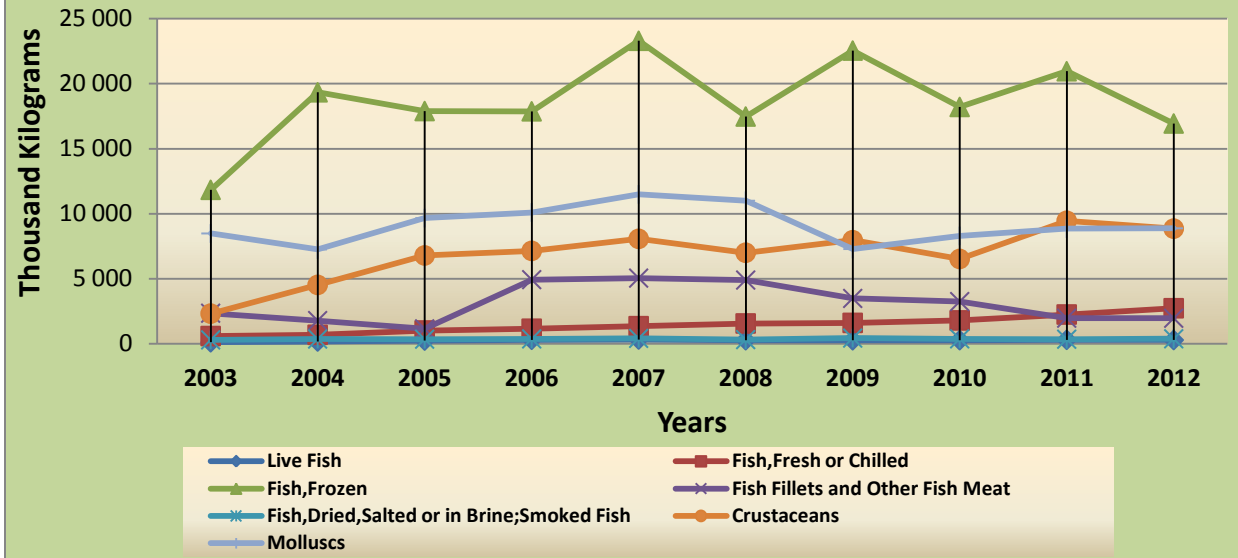


Source: Quantec EasyData

Imports (quantity and value) of fish and aquatic invertebrates have been steadily increasing from 2003 to 2007 and fluctuated during 2008 to 2012. It has been profitable to import fish and aquatic invertebrates from 2003 to 2007 since more quantities were imported with less value in contrast during 2008 and 2012 it was less profitable to import fish and aquatic invertebrates products. On average 40 million kilograms per annum of fish and aquatic invertebrates worth R 737 million has been imported during the past decade.

The following figure shows the various fish and aquatic invertebrates' products imported by South Africa from 2003 to 2012.

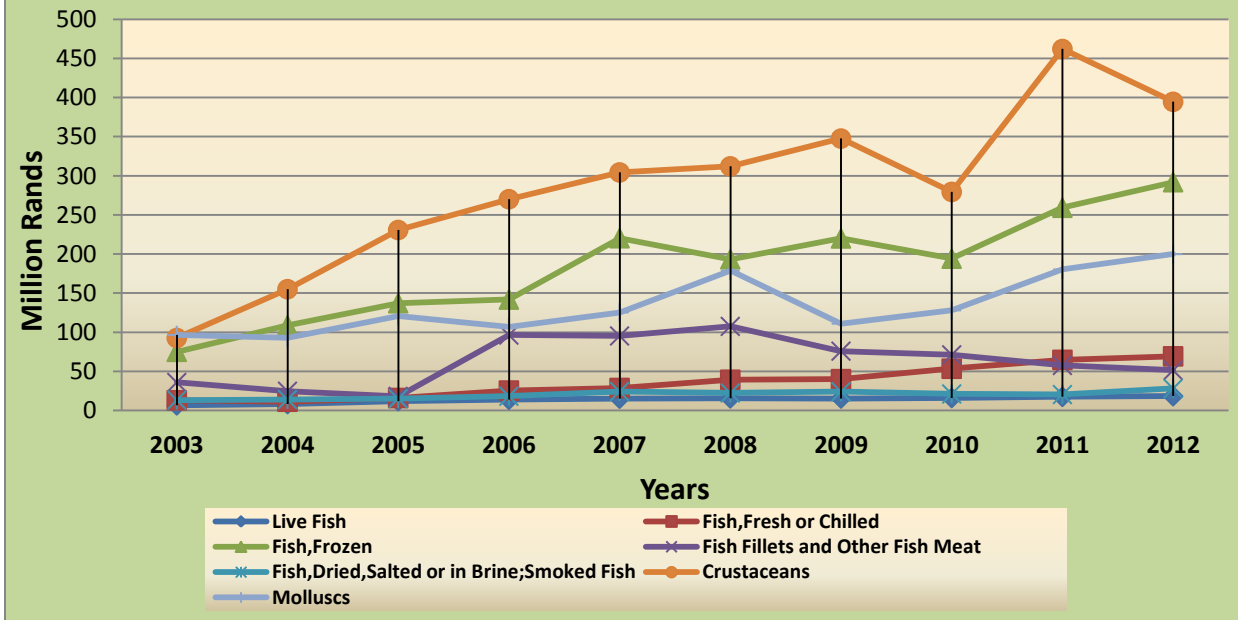
**Figure 23: Import quantities of fish and aquatic invertebrates**



Source: Quantec EasyData

Figure 22 indicates that the most imported fish and aquatic invertebrates' product during the past decade was frozen fish followed at a distant by molluscs and crustaceans. On average the quantity of frozen fish imported was 18.6 million kilograms, molluscs was 9 million kilograms and crustaceans was 7 million kilograms per annum during the period 2003 to 2012.

**Figure 24: Import values of fish and aquatic invertebrates**

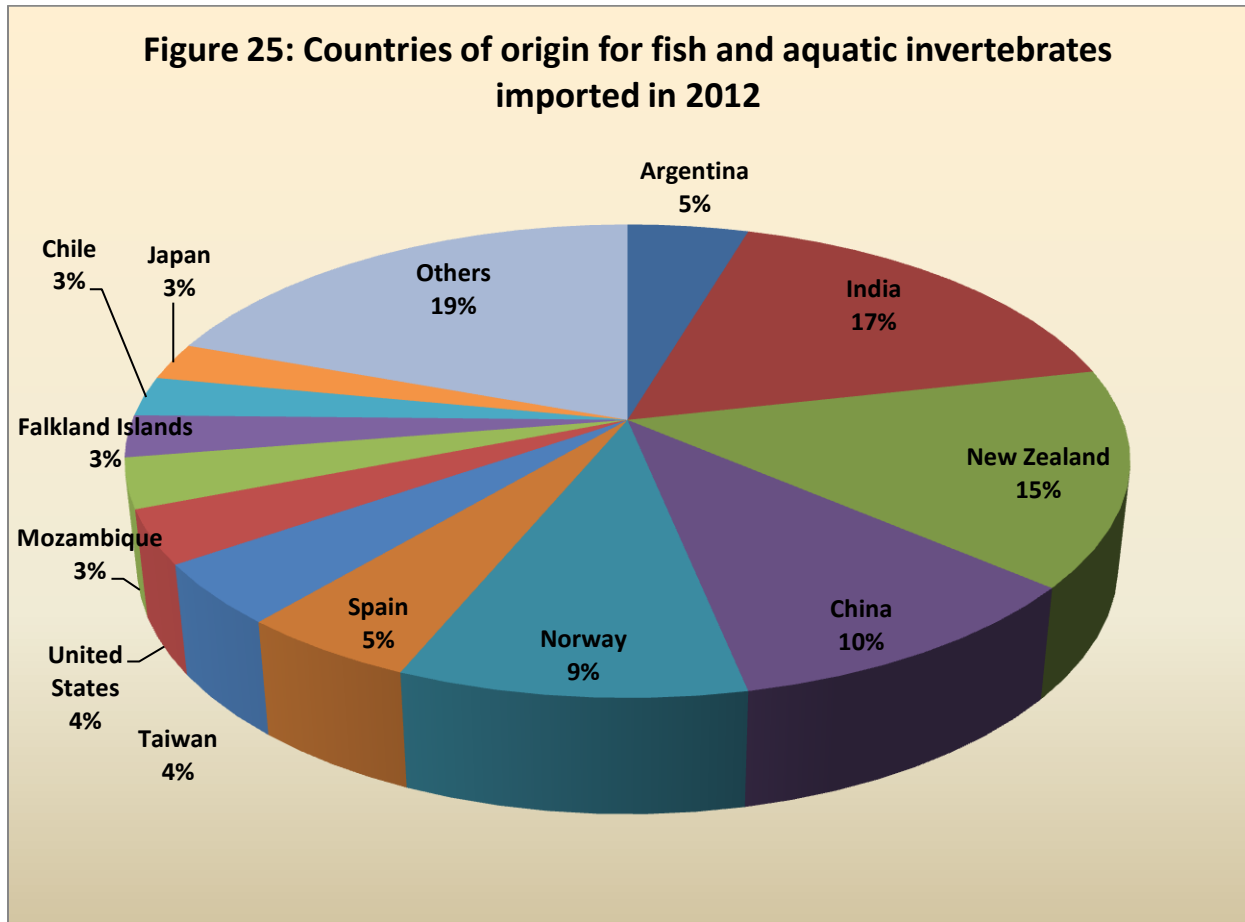


Source: Quantec EasyData



Crustaceans commanded the third largest quantities (see Figure 23) but its value was the highest during the period under review followed by frozen fish and molluscs. Crustaceans commanded a total value of R 2.8 billion followed by R 1.8 billion for frozen fish and molluscs with R 1.3 billion. This shows that although frozen fish is the most imported product, it is less expensive relative to crustaceans.

South African imports of fish and aquatic invertebrates were mainly from New Zealand, India, United States (US) and China. Figure 24 below shows the origin of South African fish and aquatic invertebrates imports.



Source: Quantec EasyData

Most of South African fish and aquatic invertebrates' imports were from India, which commanded the greatest shares of 17% of South African fish and aquatic invertebrates' imports market, followed by New Zealand with 15%, China with 10% and Norway with 9%. The mentioned four countries constitute 51% shares of South African imports and the other countries shared among themselves 49% of South African fish and aquatic invertebrates' imports.

### 3. Organizational Analysis

#### 3.1. Threats and Opportunities

Some of the Threats and Opportunities for fish farming in South Africa are as follows:

**Table 10: Threats and opportunities in the aquaculture industry**

Threats	Opportunities
<ul style="list-style-type: none"> <li>➤ Shortage of expertise and aquaculture professionals.</li> <li>➤ Lack of technical skills and technical support or extension services.</li> <li>➤ High feed, equipment and technology costs.</li> <li>➤ Lack of veterinary services and disease management.</li> <li>➤ Poor government understanding and support.</li> <li>➤ Lack of species choice and good seed stock.</li> <li>➤ Complex resource-based legislation.</li> <li>➤ Inaccessible financial sector and poor financial support services.</li> <li>➤ Lack of marketing services, marketing structures and market penetration.</li> </ul> <p>Climatic variability and seasonality.</p>	<ul style="list-style-type: none"> <li>➤ There is high demand for affordable protein and shortages in traditional fisheries products.</li> <li>➤ Aquaculture is moving onto Government agenda.</li> <li>➤ High potential for agricultural diversification.</li> <li>➤ Good natural resources.</li> <li>➤ Good infrastructure.</li> <li>➤ Potential for export opportunities.</li> <li>➤ Linkages with tourism.</li> <li>➤ Growing economy and good economic climate.</li> </ul>

### **3.2. Key Constraints**

Aquaculture industry reveals that growth has fallen far short of expectation due to the following constraints:

- Uncoordinated institutional environment
- Lack of appropriate technology
- Difficulties in obtaining suitable culture sites
- Inadequate public sector support measure to pioneer farmers
- High production costs
- Lack of local quality feed
- Lack of access to suitable water quantity and quality for freshwater aquaculture.

## **4. Aquaculture Projects**

### **4.1 Department of Science and Technology (DST) projects**

- The DST in partnership with the University of Stellenbosch and other partners have been providing support, training and technology for the establishment of emerging trout farmers within the private irrigation dams on the wine estate of the Southern Western Cape region (Stellenbosch, Tulbagh, and Worcester). Following a successful five-site grow-out pilot, the objective is to establish 35 small-scale trout farmers each producing 6-8 tons of trout annually, with a retail value of R 6.5 million. These are registered as members of Hands-On Small-Scale Fish Farmer Co-Op, which has secured 200 tons per

annum of Grade-A trout supply agreement with Three Streams Smokehouse, whose products retail at Woolworths and Pick n Pay. In 2008/9 Hands-On is being incubated as a business and will be exited, with 35 members, a 250 ton production capacity, and a slaughter facility to enable primary beneficiation and product development on site, as well as the ability to process its produce and develop its own brand.

- The DST-DoA-DWAF provincial grow-out pilots are to establish one provincial grow-out pilots per province to ascertain the technical, environmental, and commercial factors of the production of indigenous fresh-water species (tilapia, catfish (barbell), trout and carp) using High-Density Poly-Ethylene (HDPE) cage-net technology in State-owned irrigation waterworks. The target provinces are Eastern Cape, Kwazulu-Natal, Limpopo, Mpumalanga, North West, Northern Cape and Free State. These provinces have fledgling aquaculture industry, and potential for growth, however require technology support and capacity development to do so.
- The Hondeklip Bay Abalone Grow-Out pilot consisted of 16 grow-out cages, stocked with 20 000 animals. The pilot is housed in the disused Oceana Lobster Processing plant. The buildings were renovated to accommodate the pilot infrastructure. The cages are based on exactly the same production technology used by commercial farmers in the Western Cape. HIK Abalone, the technology partner to the project, one of the largest abalone producers, worked in partnership with the University of Stellenbosch in implementing the grow-out pilot in which growth-rates were monitored in Hondeklip Bay and at HIK Farm (as control) over 2-years. The DST in partnership with the Fishing and Mariculture Development Agency (FAMDA) and HIK Abalone teamed up in 2007 to expand the project, and to establish abalone-basket manufacturing SMME, pipe fitting workshop, component storage, and project office, in anticipation of possible commercial expansion of the pilot. The project is being expanded from the current 16 tanks to 92 with a capacity to accommodate 100 000 animals. Already 20 additional production tanks have been installed, and 15 permanent jobs and 80 part-time job opportunities have been established, all benefiting local people. The FAMDA Aquaculture Certificate Programme and an intensive aquaculture training programme accredited by Stellenbosch University are being provided to the beneficiaries. A community small-scale West Coast rock-lobster operation is also being assisted by providing live-lobster holding facility and technology support.
- Marine Finfish Grow-Out Pilot entails three indigenous and endangered South African line-fish species, namely dusky kob (*Argyrosomus japonicus*), silver kob (*A. inodorus*) and yellowtail (*Seriola lalandi*). These species are good candidates for cage aquaculture because they are widely distributed, highly productive, tolerate a wide range of temperatures and share an excellent domestic and international market profile. Through R&D in the past 5 years I&J Limited has successfully developed the technology to spawn all three species from wild-caught brood stock and proceeded to establish a commercial finfish hatchery at Danger Point (Gansbaai) commercially producing fingerlings from the 3 species, for aquaculture. Four HDPE Cages were constructed and successfully introduced in the water in November 2007. The cages incorporate a Scottish design, built using locally supplied materials, and the mooring system was designed by an Australian company that has deployed these systems in various parts of the world. In December 2007, 40 000 dusky kob fingerlings with an average mass of 8 grams were introduced in sea cage number four. The successful introduction of kob was followed up by the introduction of 18 000 yellowtail fingerlings, with an average weight of 5 grams, in sea cage number two. Both cages are equipped with locally-produced predator nets of 160mm and with an inside net presently of 10 mm.

- Yellowtail Ranching (Western Cape) project aims at developing and demonstrating technology whereby beach-seine encircled yellowtail is transferred to a towing cage, towed back to a selected holding site and then transferred into moored holding cages. Here the fish would be held, conditioned and marketed, thus enabling the fishermen and women to retain quality of their catch, and develop a profitable and sustainable yellowtail ranching venture, priding itself on product quality, environmental awareness, and technical innovation.

#### **4.2 Aquaculture Development and Enhancement Programme (ADEP)**

Minister of Trade and Industry (the dti) has launched the Aquaculture Development of and Enhancement Programme (ADEP) to stimulate the investment and growth in the aquaculture sector. The aim of ADEP is to stimulate investment in the aquaculture sector with the intention to increase production; sustain and create jobs; encourage geographical spread and broaden participation. ADEP will offer a grant of R40 million for new and expansion of the existing projects. Aquaculture is still at an infancy stage and ADEP will provide an opportunity to grow the sector.

#### **4.3 Aquaculture Value Chain Round Table (AVCRT)**

The Department of Agriculture, Forestry and Fisheries (DAFF) developed the Concept document on Value Chain Round Tables (VCRTs) during 2011, which was subsequently approved by the Minister. A VCRT is a forum that brings together industry leaders from different nodes of a value chain to coordinate processes aimed at resolving value-chain challenges with the purpose of enhancing value chain competitiveness and meeting consumer needs. The aim of VCRT is to foster collaborative industry-government actions that help to secure an enduring global advantage without limiting the round table to issues and developments that are external to South Africa. The round table considers domestic sectoral development activities as they directly impact on South Africa's global competitiveness and its reputation as a food supplier.

The Aquaculture Association of Southern Africa (AASA) formally requested the establishment of the Aquaculture Value Chain Round Table (AVCRT) through the office of the Deputy Director General: Economic Development, Trade and Marketing. The request was accepted and the department appointed the Chief Director: Aquaculture and Economic Development, Dr. Motseki Hlatshwayo to serve as the co-chair of the VCRT representing the government. Mr. Roger Krohn, the President of AASA was appointed as the co-chair of the Value Chain Round Table, representing the aquaculture industry.

Members of the AVCRT are inclusive of aquaculture farmers, feed manufacturers, emerging and commercial aquaculture farmers from different subsectors, researchers from universities, government officials from different departments, hatchery operators and Fish Processing Establishment exemption holders, NGOs, implementing agencies and labour unions.

### **5. THE VALUE CHAIN**

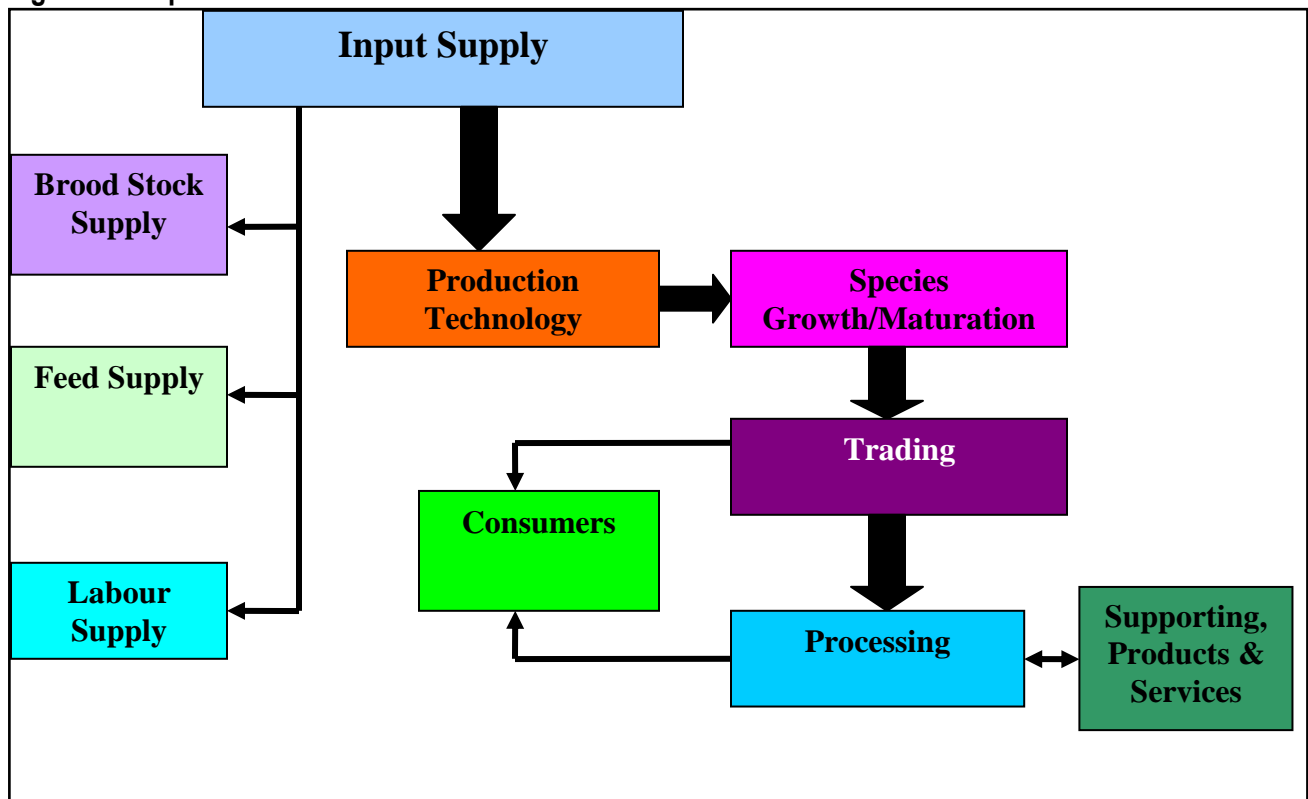
The value chain for aquaculture comprises of a number of primary activities. The "input supply" stage consists of three critical elements: (i) Stock supply which originates from hatcheries or nurseries; (ii) the

feed supply which is either imported or produced locally and (III) the labour supply which carry out the various activities within the hatcheries.

The second element is that of “production technology” where the technology utilized depends on the type of business enterprise to be carried out i.e. whether cages or ponds, as well as the various methods of transportation and capital equipment required.

The third stage is the maturing of the species and where they reach the correct age for distribution and sale. This makes up the next step, where the trading of the particular species is underway, either to the local or export market. The traders will either process the species themselves or sell it to processors who in turn will sell it to the consumers. Supporting products and services include the research and technology element of this value chain.

**Figure 26: Aquaculture market value chain**



Source: Trade and Investment Cadadu

## 6.1. Competitiveness of fish and aquatic invertebrates industry in exports

**Table 11: List of importing markets for fish and aquatic invertebrates exported by South Africa in 2012**

Importers	Trade Indicators							
	Exported value 2012 (USD thousand)	Trade balance 2012 (USD thousand)	Share in South Africa's exports (%)	Exported growth in value between 2008-2012 (% p.a.)	Exported growth in value between 2011-2012 (% p.a.)	Ranking of partner countries in world imports	Share of partner countries in world imports (%)	Total import growth in value of partner countries between 2008-2012 (% p.a.)
World	435435	306866	100	0	-10		100	7
Spain	76047	70148	17.5	-11	-11	4	5.4	-2
Hong Kong, China	59670	59343	13.7	6	1	10	3.2	11
Italy	58340	58338	13.4	-2	-25	6	4.3	2
United States of America	27435	24574	6.3	3	5	2	13.6	5
Portugal	27067	26468	6.2	7	-6	17	1.8	1
Australia	25580	24944	5.9	9	8	24	0.8	13
China	22638	10240	5.2	65	-40	3	5.6	13
Japan	16734	15159	3.8	-16	-14	1	14.2	6
France	13047	13007	3	-4	-27	5	4.8	3
Angola	10739	10739	2.5	65	13	51	0.2	35
Cameroon	10559	10559	2.4	101	-37	40	0.2	10
Mozambique	9934	4251	2.3	15	55	88	0	10
Netherlands	9115	9085	2.1	14	19	15	2.3	8
United Kingdom	8801	6531	2	-20	-9	12	2.5	1

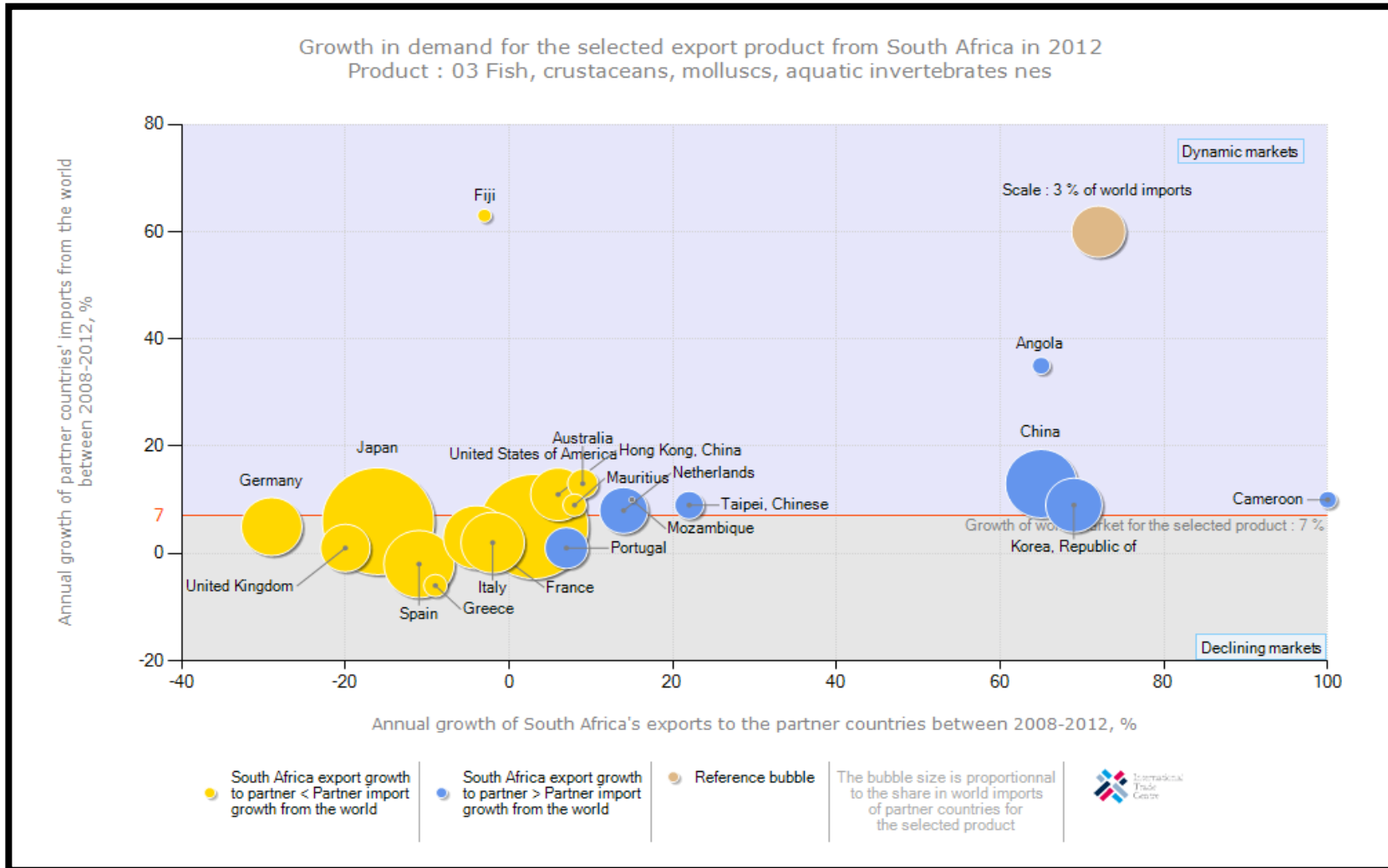
Source: ITC calculations based on COMTRADE statistics.

In 2011, South Africa's exports represented **0.46%** of world exports for fish and aquatic invertebrates and its ranking in world export was **41**. Table 11 shows that the total exported South African fish and aquatic invertebrates during 2012 was valued at US\$ 435 435 000. South Africa exported greater quantities of fish and aquatic invertebrates to Spain, Hong Kong (China) and Italy. The greatest share of South African fish and aquatic invertebrates exports were destined to Spain which commanded 17.5% share during the year 2012 followed by Hong Kong (China) and Italy with 13.7% and 13.4% shares respectively.

South African fish and aquatic invertebrates' exports to the world increased by 0% in value per annum between the periods 2008 and 2012. During the same period, exports value of fish and aquatic invertebrates to Spain decreased by 11% and exports value to Hong Kong (China) increased by 6% and Italy decreased by 2% respectively.

Exports value of fish and aquatic invertebrates to the world decreased by 10% during the period 2011–2012. During the same periods exports value to Spain decreased by 11% and Hong Kong (China) increased by 1% while Italy decreased by 25%.

**Figure 27: Growth in demand for fish and aquatic invertebrates exported by South Africa in 2012**



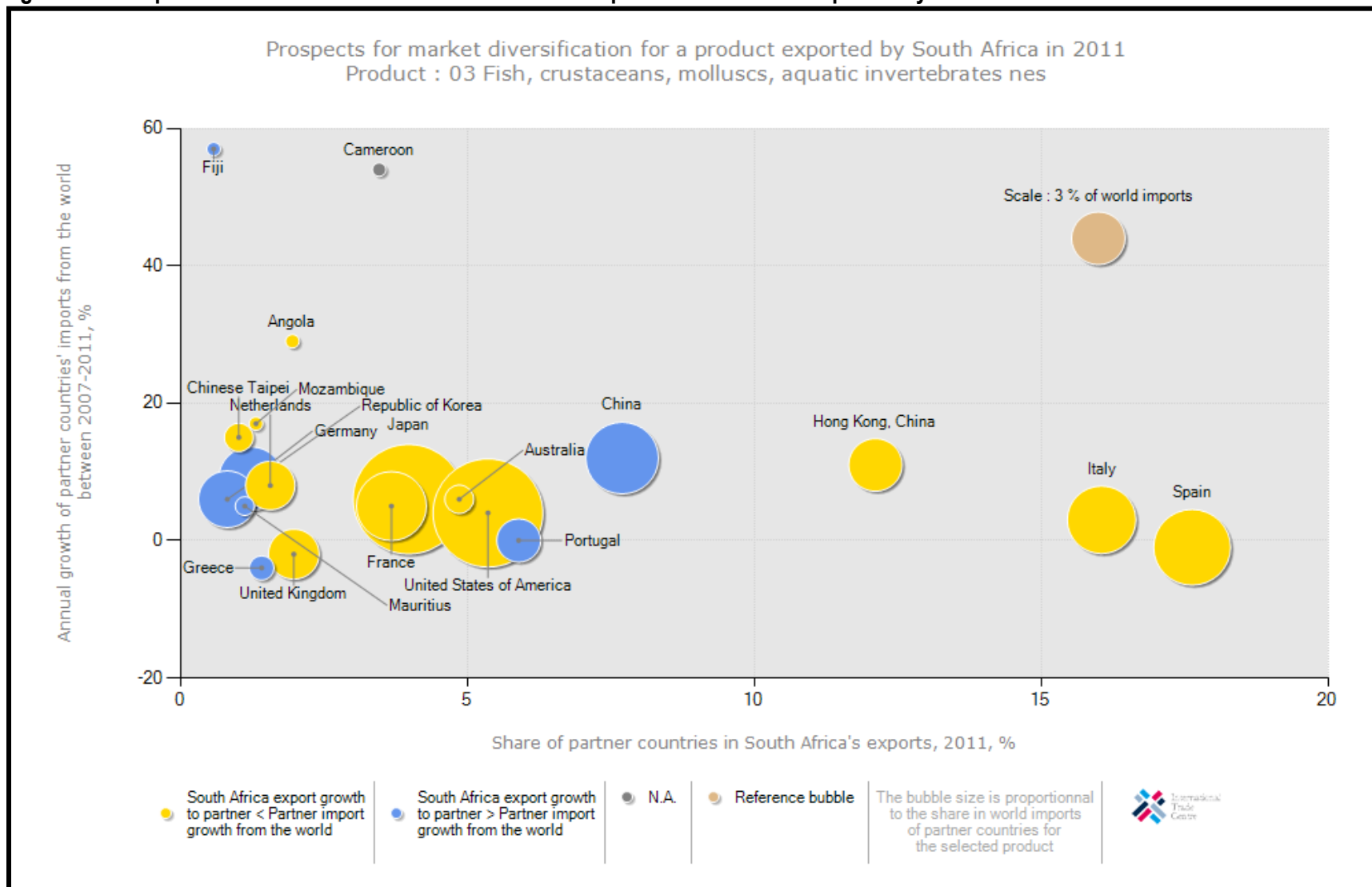
Source: Trademap, ITC



Figure 27 shows that between the periods 2008 - 2012 South Africa's exports to Germany, United Kingdom, Japan, Spain, Greece, France, Italy, United States of America, Hong Kong, Australia, Mauritius and Fiji were growing at a rate that is less than their imports from the world. During the same periods South Africa's exports to Netherlands, Portugal, Mozambique, republic of Korea, China, Angola, Cameroon and Taipei were growing at a rate that is greater than their imports from the world.

Further analysis indicates that the most growing demand of South African fish and aquatic invertebrates exists in Cameroon with South African exports to Cameroon growing at a rate of 101% per annum. The fastest growing import market is found in Fiji where its import growth is at 63% per annum but South African exports to Fiji decreased by 3%.

**Figure 28: Prospects for market diversification for fish and aquatic invertebrates exported by South Africa in 2011**



Source: Trademap, ITC

Most of South Africa's fish and aquatic invertebrates were exported to Spain, but Figure 28 shows that Spain still import more fish and aquatic invertebrates from the rest of the world than in South Africa. Spain has a world import market share of 5.4%. If South Africa wishes to diversify its fish and aquatic invertebrates exports, it can penetrate the markets of Fiji because it's annual growth of 63%. Japan and USA are the biggest markets in the world with the world import market share of 14.2% and 13.6% respectively but their annual imports growths are very low at 6% and 5% respectively per annum.. These restrict South Africa to penetrate into their import market.

## 6.2. Competitiveness of fish and aquatic invertebrates industry in imports

**Table 12: List of exporting markets for fish and aquatic invertebrates imported by South Africa in 2012**

Exporters	Trade Indicators							
	Imported value 2012 (USD thousand)	Trade balance 2012 (USD thousand)	Share in South Africa's imports (%)	Imported growth in value between 2008-2012 (% p.a.)	Imported growth in value between 2011-2012 (% p.a.)	Ranking of partner countries in world exports	Share of partner countries in world exports (%)	Total export growth in value of partner countries between 2008-2012 (% p.a.)
World	128569	306866	100	8	-12		100	9
India	32628	-32380	25.4	12	-10	7	3.5	30
Norway	16367	-16289	12.7	24	16	2	9.1	9
China	12398	10240	9.6	12	-8	1	12	23
New Zealand	12245	-11343	9.5	10	-1	24	1.2	8
Argentina	6862	-6862	5.3	30	-14	22	1.4	4
Spain	5899	70148	4.6	13	68	8	3	4
Mozambique	5683	4251	4.4	2	10	99	0	-21
Falkland Islands (Malvinas)	3116	-3116	2.4	3	51	56	0.2	6
Ecuador	3020	-2884	2.3	175	-25	19	1.7	18
United States of America	2861	24574	2.2	-7	-67	3	5.3	10
Chile	2565	-2565	2	-3	19	6	3.7	6
Taipei, Chinese	2564	3212	2	14	8	15	2	11
Thailand	2421	-483	1.9	-9	-77	10	3	4

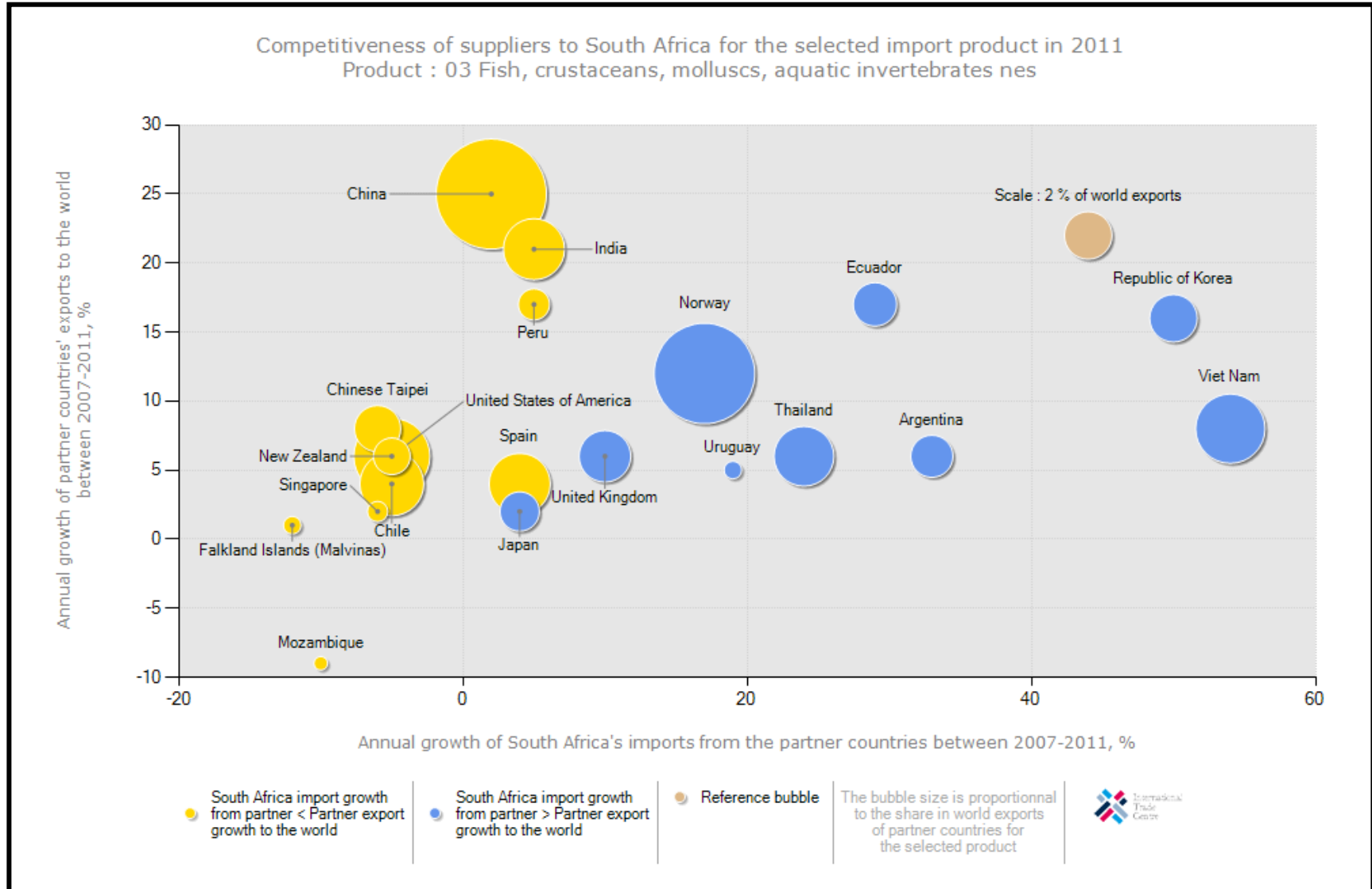
Source: ITC calculations based on COMTRADE statistics.

In 2012, South Africa's imports represented **0.13%** of world imports for fish and aquatic invertebrates and its ranking in world export was **58**. Table 12 shows that during 2012 South African imported fish and aquatic invertebrates was valued at US\$ 128 569 000. The main suppliers were India, Norway, China, New Zealand and Argentina which commanded the shares of 25.4%;12.7%; 9.6%; 9.5% and 5.3% respectively.

South African imports value growth rate of fish and aquatic invertebrates from 2008 to 2012 increased by 8% per annum. At the same time imports value to India, Norway, China, New Zealand and Argentina increased by 12%; 24%; 12%; 10% and 30% respectively per annum during the same periods.

South African imports value of fish and aquatic invertebrates during the period 2011-2012 decreased by 12%. India also experienced a decrease of 10% in contrast Norway experienced an increase of 16% whereas China, New Zealand and Argentina experienced a decrease of 8%; 1% and 14% respectively during the same periods.

Figure 29: Competitiveness of suppliers to South Africa for fish and aquatic invertebrates in 2011

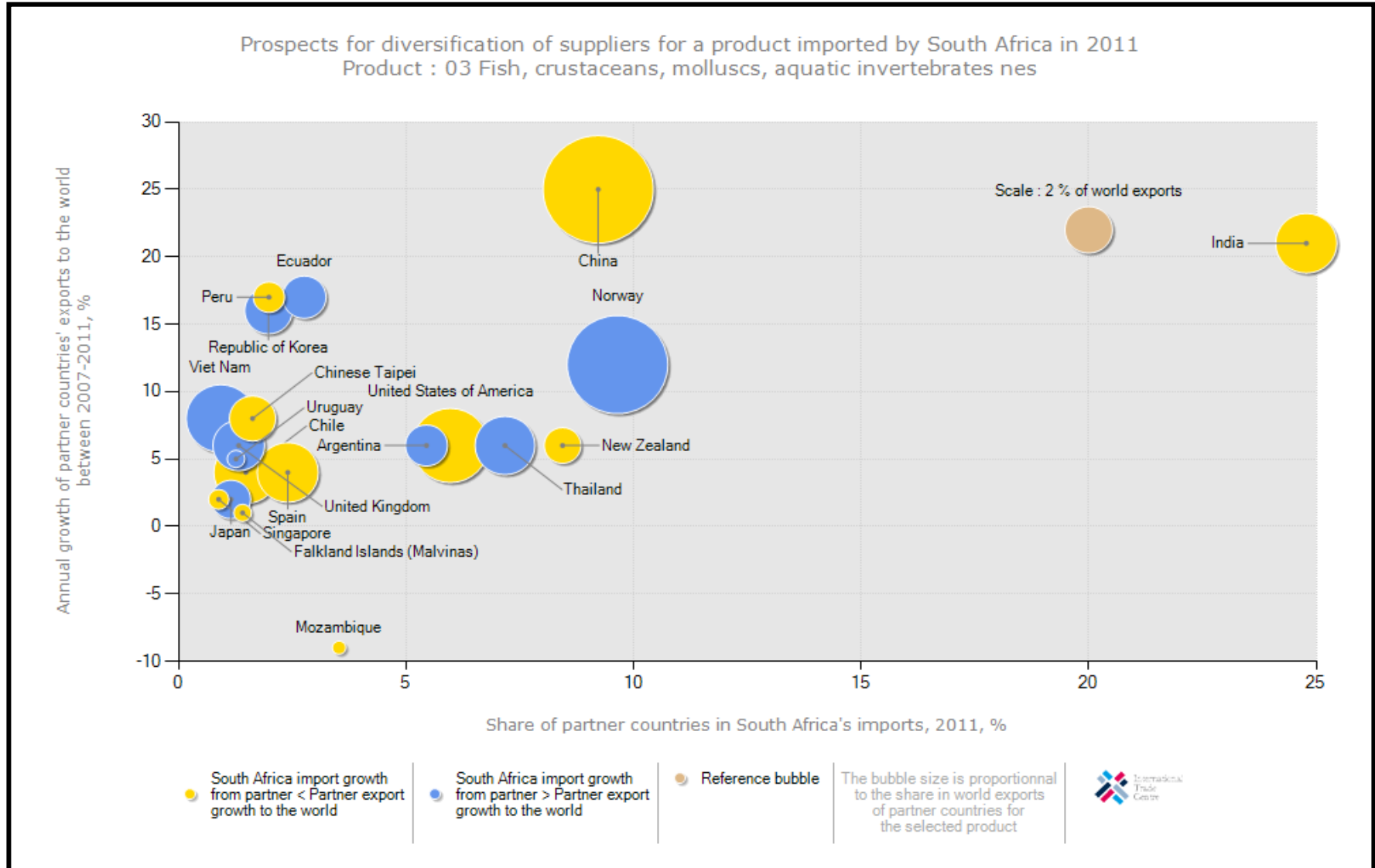


Source: Trademap, ITC

Figure 28 illustrates that between 2008 and 2012 South Africa's fish and aquatic invertebrates' imports from the China, India, Peru, Singapore, United States of America, Falkland Islands, Chile, Thailand and Japan were growing at a rate that is less than their export growth to the world. It was also noticed that during the same period South Africa's fish and aquatic invertebrates' imports from Viet Nam, United Kingdom, Norway, Uruguay, New Zealand, Ecuador, Spain, Taipei, Mozambique and Argentina were growing at a rate greater than their export to the world.

India, China and Ecuador are most growing markets of fish and aquatic invertebrates with the annual export growth of 30%, 23% and 18% rate respectively. Ecuador was the most competitive export market to South Africa because South Africa's annual imports of fish and aquatic invertebrates from Ecuador increased by 175% in 2012.

Figure 30: Prospects for diversification of suppliers for fish and aquatic invertebrates imported by South Africa in 2011



Source: Trademap, ITC



Figure 30 above shows the prospects for diversification of suppliers for fish and aquatic invertebrates by South Africa in 2012. If South Africa is to diversify its fish and aquatic invertebrates' imports the biggest suppliers exists in China and Norway. Therefore, the mentioned countries are the most attractive markets which South African fish and aquatic invertebrates market can penetrate. Currently China and Norway's shares on South African imports are at 9.64% and 12.73% respectively.

South Africa is already importing significant quantities of fish and aquatic invertebrates from India which is the fastest growing market. India's annual export growth is 30% per annum and its exports to South Africa increased by 25.38%.

## 6. AQUACULTURE INDUSTRY BODIES

### Overarching Aquaculture Sector Association:

a) Aquaculture Association of Southern Africa (AASA)  
Chairperson: Mr Etienne Hinrichsen  
Cell: +27-(0)82 8221236  
Email: [aquaeco@telkomsa.net](mailto:aquaeco@telkomsa.net)  
E-mail: [chairman@aasa-aqua.co.za](mailto:chairman@aasa-aqua.co.za)  
Website: [www.aasa-aqua.co.za](http://www.aasa-aqua.co.za)

b) Sub-sector associations:

c) Abalone Farmers Association of Southern Africa (AFASA)  
Chairperson: Roger Krohn  
Tel: +27-28-313-1055  
Fax: +27-28-312-2288  
E-mail: [barnes@mweb.co.za](mailto:barnes@mweb.co.za)  
Cell: +27-(0)83 255 3765

d) Aquaculture Institute of South Africa (AISA)  
Contact: Dr Lizeth Botes  
Email: [lbotes@ai-sa.org.za](mailto:lbotes@ai-sa.org.za)  
Tel: 021 556 7339

e) Catfish South Africa  
Chairperson: Ingo Beckert  
Cell: +27-(0)82 569 8906  
E-mail: [ingobeckert@gmail.com](mailto:ingobeckert@gmail.com)

f) Mpumalanga Trout Producers Forum.  
T: +27-(0)13 235 1248/4101  
F: +27-(0)13 235 4101  
E-mail: [Lunsklip@intekom.co.za](mailto:Lunsklip@intekom.co.za)

g) Mussel and Oyster Forum  
Chairperson: Vossie Pienaar  
PO Box 814, Saldanha, 7395  
Tel: +27-(0)22 7142107

F: +27-(0)22 7142107  
E-mail: [bbmussel@mweb.co.za](mailto:bbmussel@mweb.co.za).

h) Western Cape Tilapia Growers Association  
Chairperson: Glen Thomas  
Tel: +27-(0)21 4610260  
E-mail: [gthomas@iafrica.com](mailto:gthomas@iafrica.com)  
[www.aquaculture-africa.com](http://www.aquaculture-africa.com)

i) South African Koi Traders Association (SAKTA).  
Chairperson: Collin Nel  
PO box 3136, Montana Park, 0159  
Cell: +27-(0)83 451 3284  
Mobile fax: +27-(0)83 281 5862  
E-mail : [sakta@orientkoi.com](mailto:sakta@orientkoi.com)

j) Tilapia Association of South Africa (TILASA)  
Chairperson: Kriek Bekker  
P O Box 3423, Matieland, 7602  
Tel. & Fax: +27-(0)21 8852122  
E-mail: [anfic@telkomsa.net](mailto:anfic@telkomsa.net)

k) Western Cape Trout Producers Association  
Chairperson: Krijn Resoort  
Tel: +27-(0)21 372 1100  
F: +27-(0)21 371 4900  
E-mail: [krijn@molapong.co.za](mailto:krijn@molapong.co.za)

l) Marine Finfish Association  
Chairperson: Rob Landman  
Irvin & Johnson Holding Company (Pty) Ltd  
Tel:+27-(0)21 402 9490  
Fax:+27-(0)21 402 9375  
E-mail: [RobertLa@ij.co.za](mailto:RobertLa@ij.co.za)

m) Ornamental Fish Producers  
Chairperson: Leslie Ter Morshuizen

Tel:+27-(0)46 6223690  
F:+27-(0)46 6224868  
E-mail: [lesley@aquaafrica.co.za](mailto:lesley@aquaafrica.co.za)

### **Working groups**

- n) Aquaculture Sector Workgroup (ASWG) - National  
Secretariate: Pontsho Moji  
Department: Agriculture, Forestry & Fisheries P/Bag X138, Pretoria (Tshwane), 0001  
Tel: +27-(0)12 319 7404  
Fax: +27-(0)12 319 7570  
Email: [pontshom@daff.govza](mailto:pontshom@daff.govza)
- o) SAWG Vice-Chairperson: William Gertenbach  
Department of Agriculture.  
Private Bag X1, Elsenburg, 7607  
Tel: +27-(0)21 808-5220  
F: +27-(0)21 808-5407  
Email: [williamg@elsenburg.com](mailto:williamg@elsenburg.com)
- p) Northern Aquaculture Workgroup (NAWG) - Regional  
Chairperson: Richard Viljoen  
Department of Agriculture & Land Administration, Lowveld Research Unit, Engineering Complex, Private Bag X11318, Nelspruit, 1200  
Tel: +27-(0)13 752-6643  
F: +27-(0)13 755-5097  
Email: [RViljoen@LAEVELD1.AGRIC.ZA](mailto:RViljoen@LAEVELD1.AGRIC.ZA)
- q) Aquaculture Value chain Round Table (AVCRT)  
Co-Chairpersons: Mr. Roger Krohn and Mr. Belemane Semoli  
Department of Agriculture, Forestry & Fisheries  
Private Bag X2  
Roggebaai, Cape Town  
8012

## 7. ACKNOWLEDGEMENTS

The following organizations are to be acknowledged:

- a. Aquaculture Association of South Africa.  
[www.aasa-aqua.co.za](http://www.aasa-aqua.co.za)
- b. Competition Commission  
[www.comptrib.co.za](http://www.comptrib.co.za)
- c. FAO  
[www.fao.org](http://www.fao.org)
- d. Statistics and Economic Analysis  
[www.daff.gov.za](http://www.daff.gov.za)
- e. Oceana  
[www.oceana.co.za](http://www.oceana.co.za)
- f. Premier Fishing.  
[www.PremierFishing.co.za](http://www.PremierFishing.co.za)
- g. Quantec.  
[www.quantec.co.za](http://www.quantec.co.za)
- h. Trade and Industrial Policy Strategies (TIPS)  
[www.tips.org.za](http://www.tips.org.za)
- i. Aquaculture Institute of South Africa (AISA)  
Contact: Dr Lizeth Botes  
Email: lbotes@ai-sa.org.za  
Tel: 021 556 7339
- j. Aquaculture Technical Services  
[www.daff.gov.za](http://www.daff.gov.za)  
Email: aquaculture@daff.gov.za

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