A PROFILE OF THE SOUTH AFRICAN AQUACULTURE MARKET VALUE CHAIN

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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 and Brown mussels, Dusky and Silver Kob, yellow tail, Atlantic Salmon, Clownfish, White Margined Sole, West and East coast rock Lobster, Scallop and Blood Worm. Freshwater species are generally farmed in recirculating 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 and 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.

![Figure 1: Gross value of aquaculture production](image)

Source: FAO

The gross value of aquaculture production has been moving at an increasing trend from 2007 to 2013. Starting from 2013 to 2016, the value experienced a decrease of 32%. This might be due to the fluctuations in price of aquaculture products. The value of aquaculture production experienced a peak of 67,908,461 US$ in 2013. Generally, there is an increase of 40% during 2016 compared to 2006.

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 Kwa-Zulu 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, centred 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 2015.

![Figure 2: Marine aquaculture farms per Province in 2015](image)

Source: Aquaculture Technical Services; DAFF

Figure 2 above shows that Western Cape has most farms of marine aquaculture accounting to 62% of South African marine farms, followed by Eastern Cape by 17%, Northern Cape by 15% and Kwa-Zulu Natal by 6%.
Figure 3 below shows the South African aquaculture production from 2006 to 2015.

According to Figure 3, production of aquaculture in South Africa has been increasing for the past decade. However, there was a slight decrease in 2007 and 2009. Despite these fluctuations, aquaculture production has increased by 2 775 tons (105%) since 2006. The total of aquaculture production in 2015 was 5 418 tons, which represent 4% increase from 2014. The slight decrease in 2010 was due to the non-operations of some of the South African finfish and prawns farms.

The following figure shows the production of marine aquaculture per Province.
Figure 4 above clearly shows that marine aquaculture production dominated in the Western Cape Province accounting for 92% with its tonnage making up 3 308 tons, followed by Eastern Cape with 7% (239 tons) and Northern Cape and Kwa-Zulu Natal accounting for less than 1% (19 and 24 tons) respectively.

1.2. Employment

The South African Department of Agriculture, Forestry and Fisheries (DAFF), Aquaculture Technical Service (ATS) Division estimates the marine aquaculture sector to be employing 3 826 people in 2015. That is a 17.5% average annual employment increase. The increase in the aquaculture employment is endorsed by government support through measures such as Aquaculture Development and Enhancement Programme (ADEP) and Operation Phakisa. Within the aquaculture sector, the majority of jobs were created by the abalone sub-sector followed by tilapia and mussel sub-sectors.

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 47% share in the processing sector and the remaining 53% were taken up by the large number of small fishing companies. Figure 6 illustrates Market Shares in the Aquaculture Industry.
Figure 5 shows that Oceana holds the greatest share of the market in the aquaculture processing industry followed by Premier (9%) 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 2007 to 2016.

Source: FAO
Figure 6 shows that producer price of aquaculture products moved at an increasing trend from 2007 to 2010. Then followed by a decrease from 2011 to 2016. South African producer price reach a peak in 2010 (10 991 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 103 457 tons of fish and aquatic invertebrates in 2016 yielding an export value of R6.4 billion.

Figure 7 shows the exports of South African fish and aquatic invertebrates from 2007 to 2016.

Figure 7: Fish and aquatic invertabrates exports

Source: Quantec EasyData

Figure 7 shows that exports of fish and aquatic invertebrates fluctuated throughout the decade. It further shows that it was more profitable to export because few quantities were exported with more value from 2007 to 2016 except in 2011 where the value was lower with high quantities of exports. Despite the decrease of quantities from 2011 to 2015, the value had shown an increasing trend during the same period. The highest quantity of fish and aquatic invertebrates exports was R 6.44 billion in 2016. From year 2015 to 2016, there was an increase of 6% in quantity exported and an increase of 21% in value. This is due to the rising demand of fish and fish products, which affected the price to increase.

Figure 8 below shows the different fish and aquatic invertebrates’ products that were exported from 2007 to 2016.
From Figure 8, it is evident that frozen fish was the main exported product from South Africa over the past ten years exporting 875 887 tons as compared to 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 and aquatic invertebrates with the total of 857 and 281 tons respectively over 10-year period.
Figure 9 above shows the value of exports from 2007 to 2016. It is clear from the figure that there is a negative relationship between the value and quantity of exports. The trends of values differ with the trends of quantities in Figure 8. The frozen fish commanded the greatest values of South African exports during the past ten years commanding a total of R11 billion followed by fish fillet by R 10 billion then molluscs by R 8.9 billion. Live fish and aquatic invertebrates commanded the lowest value of R 38 million and R 4 million respectively during the past decade.

Source: Quantec EasyData

Source: Trademap
Figure 10 above shows that the main destination of South African fish and aquatic invertebrates in 2016 was Italy commanding 19% followed by Spain with 18% of South Africa’s fish and aquatic invertebrates’ exports. China, Hong Kong was third highest commander with only 11% share of South Africa’s exports, followed by Portugal, United States of America (USA), Australia and Viet Nam with a share of 7%, 6%, 4%, and 3% respectively.

Figure 11 to 20 show the export values of fish and aquatic invertebrates from Provinces.

Source: Quantec EasyData

Western Cape Province has recorded high export values of fish and aquatic invertebrates from 2007 to 2016. 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. Western Cape commanded exports share of over 70% for the entire period of analysis.
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. The city commanded exports share of 80% and above from 2007 to 2016. 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 and Eden District Municipalities. Cape Winelands have recorded smallest shares of less than 1% for the entire period of analysis.

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. Overberg District Municipality shows an increasing trend and commanded the highest values.
for the entire period of analysis. This shows that Overberg dominated the export market during the past decade when City of Cape Town Metropolitan Municipality is excluded. Cape Winelands District Municipality recorded minimal exports during the period under analysis.

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

![Graph showing values of fish and aquatic invertebrates exported by Eastern Cape]

**Source: Quantec Easy Data**

Eastern Cape Province’s export values of fish and aquatic invertebrates were mainly from Nelson Mandela Bay Metropolitan Municipalities commanding above 50% export share, followed by Cacadu and Buffalo City District Municipalities during the period under review. Joe Gqabi and Alfred Nzo District Municipalities commanded minimal values of fish and aquatic invertebrates’ exports recording less than 0.1% share. Cacadu overtook Nelson Mandela Bay and became the highest exporter of fish and invertebrates with export share of 46% in 2015 and 50% in 2016.

**Figure 15: Value of fish and aquatic invertebrates exported by Northern Cape**

![Graph showing value of fish and aquatic invertebrates exported by Northern Cape]

**Source: Quantec EasyData**

From Northern Cape Province, fish and aquatic invertebrates’ exports were mainly from Namakwa and Pixley ka Seme District Municipalities. Pixley ka Seme recorded the values during 2011 and 2013 then Namakwa
from 2014 to 2016. The province recorded the highest shares during 2014 through Namakwa District Municipality. The highest export values from Pixley ka Seme were recorded during 2013. Namakwa also recorded 100% share of exports from 2014 to 2016. Both the District Municipalities are not regular exporters of fish and aquatic invertebrates. The province did not export fish and aquatic invertebrates from 2007 to 2010.

**Figure 16: Value of fish and aquatic invertebrates exported by KwaZulu-Natal Province**

<table>
<thead>
<tr>
<th>Year</th>
<th>Ugu</th>
<th>UMgungundlovu</th>
<th>Umzinyathi</th>
<th>Uthungulu</th>
<th>iLembe</th>
<th>eThekwini</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>17745</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>2008</td>
<td>16677</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>2009</td>
<td>28756</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2010</td>
<td>8791</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>2011</td>
<td>20344</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1629</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>20595</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7232</td>
<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>27504</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>47172</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2015</td>
<td>39183</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2016</td>
<td>32451</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Source: Quan tec EasyData**

In KwaZulu Natal Province eThekwini Metropolitan Municipality and Ugu District Municipality recorded for the greatest share during the period under review. Ugu district municipality commanded the greatest shares during the periods 2007, 2011 and 2013 while eThekwini commanded the greatest shares during 2008 to 2010, 2012 and from 2014 to 2016. Irregular exports of fish and aquatic invertebrates in KwaZulu–Natal Province were recorded from UMgungundlovu, UThungulu, iLembe and Umzinyathi District Municipalities. Ugu and eThekwini together commanded a share of more than 90% from 2007 to 2015. In 2016 UThungulu and iLembe had upped their exports and they had exports shares of 8% and 5% respectively. In the same year, eThekwini led by 62% followed by Ugu with 24% share of exports.
In the North West Province, intermittent exports were recorded from Bojanala and Dr Kenneth Kaunda District Municipalities in 2010 and 2009 respectively. There were no records of exports within the Province in, 2007 to 2008 and from 2011 to 2016. The greatest values were commanded by Dr Kenneth Kaunda District Municipality in 2009. In 2009, Dr Kenneth Kaunda commanded 100% share whilst in 2010 Bojanala also commanded 100% share.

In Gauteng Province, high export values of fish and aquatic invertebrates were recorded from City of Johannesburg followed a distance by Ekurhuleni District Municipality and City of Tshwane Metropolitan Municipality. The highest export value of R 380 million was recorded in 2013 from City of Johannesburg Metropolitan Municipality. City of Tshwane Metropolitan Municipality recorded regularly while Sedibeng and
West Rand District Municipalities recorded irregular export values. City of Johannesburg recorded highest exports shares of more than 60% for the entire period of analysis except 2015 and 2016 were it recorded 57% on both years. Followed by Ekurhuleni with a share of 25% and City of Tshwane 17% export shares.

Source: Quantec Easy Data

Mpumalanga Province’s export values of fish and aquatic invertebrates were mainly from Ehlanzeni District Municipality from 2007 until 2016 with high a value of R 14 million in 2012. Irregular and minimal export values were recorded from Nkangala and Gert Sibande District Municipalities from 2013 to 2016 with the export shares of less than 3% together. Both District Municipalities did not record exports from 2007 to 2012. Enhlanzeni recorded 100% shares of exports from 2007 to 2012.

Source: Quantec EasyData
From Limpopo Province, the export values of fish and aquatic invertebrates were irregular, high values were recorded during 2012 to 2013. In total, Capricorn district Municipality led exports by exporting R3.4 million, followed by Mopani District Municipality with R 3.37 million. Vhembe and Waterberg District Municipalities recorded R1.2 million and R552 000 respectively. Greater Sekhukhune was the lowest contributor on export from the Province by exporting a total of R179 for the past decade. This is a clear indication that Limpopo Province is not the main producing and exporting area of fish and aquatic invertebrates.

Source: Quantec EasyData

From Free State Province, irregular exports of fish and aquatic invertebrates were recorded. Xhariep District Municipality recorded exports from 2012 to 2016 and Thabo Mofutsanyane in 2012 and also from 2014 to 2016 while Fezile Dabi recorded exports only in 2013 and 2016. There were no export records of fish and aquatic invertebrates from Free State Province in 2009 and 2011. In total, Thabo Mofutsanyane has recorded the highest export shares of 64%, followed by Mangaung and Lejweleputswa with 25% and 11% respectively.

2.2.2. Imports.

Figure 22 below show the imports of fish and aquatic invertebrates from 2007 to 2016.
Imports (quantity and value) of fish and aquatic invertebrates have shown an increasing trend in the past decade except from 2007 to 2009 where they have shown some stability. It has been profitable to import fish and aquatic invertebrates from 2007 to 2015 since more quantities were imported with less value. However, in the year 2016, the figure shows that the profits for imports were under pressure. This may be due to the increasing international prices that were caused by increasing demand of fish and aquatic invertebrates. On average, 91 000 tons per annum of fish and aquatic invertebrates worth of R1,9 billion was imported during the past decade.

The following figure shows the various fish and aquatic invertebrates' products imported by South Africa from 2007 to 2016.
Figure 23 indicates that the most imported fish and aquatic invertebrates' product during the past decade was frozen fish followed at a distant by molluscs and fish fillets. On average the quantity of frozen fish imported was 57 million tons, mollusc was 9.7 million tons and fish fillets was 9.3 million tons per annum during the period 2007 to 2016.
Figure 24 shows the imports of fish and aquatic invertebrates in terms of monetary value for the past decade. Crustaceans have been the highest from 2007 to 2009, and then the imported frozen fish took over from 2010 to 2016. This accentuates that crustaceans are one of high value species. Crustaceans commanded the third largest in quantities (see Figure 23) but its value was the second highest during the period under review. Fish, frozen commanded highest value with a total value of R 7.8 billion followed by crustaceans with R4.6 billion, Fish fillets R 2.5 billion and Molluscs R2 billion. This shows that although crustaceans are the third most imported product, it is more expensive relative to molluscs.

Figure 25 below shows the top ten origins of South African fish and aquatic invertebrates’ imports. South African imports of fish and aquatic invertebrates were mainly from Namibia, Norway and India.

Source: Quantec EasyData
Most of South African fish and aquatic invertebrates’ imports were from Namibia, which commanded the greatest shares of 26% of South African fish and aquatic invertebrates’ imports market, followed by Norway and Morocco with 12% each, then India with 11%, China and New Zealand with 7% and 5% respectively. The mentioned six countries constitute 73% shares of South African imports and the other countries shared among themselves 27% 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 1: Threats and opportunities in the aquaculture industry

<table>
<thead>
<tr>
<th>Threats</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Shortage of expertise and aquaculture professionals.</td>
<td>➢ There is high demand for affordable protein and shortages in traditional fisheries products.</td>
</tr>
<tr>
<td>➢ Lack of technical skills and technical support or extension services.</td>
<td>➢ Aquaculture is moving onto Government agenda.</td>
</tr>
<tr>
<td>➢ High feed, equipment and technology costs.</td>
<td>➢ High potential for agricultural diversification.</td>
</tr>
<tr>
<td>➢ Lack of veterinary services and disease management.</td>
<td>➢ Good natural resources.</td>
</tr>
<tr>
<td>➢ Poor government understanding and support.</td>
<td>➢ Good infrastructure.</td>
</tr>
<tr>
<td>➢ Lack of species choice and good seed stock.</td>
<td>➢ Potential for export opportunities.</td>
</tr>
<tr>
<td>➢ Complex resource–based legislation.</td>
<td>➢ Linkages with tourism.</td>
</tr>
<tr>
<td>➢ Inaccessible financial sector and poor financial support services.</td>
<td>➢ Growing economy and good economic climate.</td>
</tr>
<tr>
<td>➢ Lack of marketing services, marketing structures and market penetration.</td>
<td></td>
</tr>
<tr>
<td>Climatic variability and seasonality.</td>
<td></td>
</tr>
</tbody>
</table>

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; and
- 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. Currently the co-chairperson representing government is Mr. Belemane Semoli, Chief Director: Aquaculture and Economic Development.

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**

![Aquaculture market value chain diagram]

*Source: Trade and Investment Cacadu*
### 6.1. Competitiveness of fish and aquatic invertebrates industry in exports

#### Table 2: List of importing markets for fish and aquatic invertebrates exported by South Africa in 2016

<table>
<thead>
<tr>
<th>Importers</th>
<th>Value exported in 2016 (USD thousand)</th>
<th>Trade balance 2016 (USD thousand)</th>
<th>Share in South Africa’s exports (%)</th>
<th>Growth in exported value between 2012-2016 (%, p.a.)</th>
<th>Growth in exported value between 2015-2016 (%, p.a.)</th>
<th>Ranking of partner countries in world imports</th>
<th>Share of partner countries in world imports (%)</th>
<th>Total imports growth in value of partner countries between 2012-2016 (%, p.a.)</th>
<th>Average tariff (estimated) faced by South Africa (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>441641</td>
<td>195119</td>
<td>100</td>
<td>-1</td>
<td>12</td>
<td>100</td>
<td>2</td>
<td></td>
<td>5.7</td>
</tr>
<tr>
<td>Italy</td>
<td>85192</td>
<td>85173</td>
<td>19.3</td>
<td>10</td>
<td>32</td>
<td>7</td>
<td>4.5</td>
<td>3</td>
<td>5.7</td>
</tr>
<tr>
<td>Spain</td>
<td>78827</td>
<td>75998</td>
<td>17.8</td>
<td>2</td>
<td>19</td>
<td>4</td>
<td>5.7</td>
<td>4</td>
<td>5.7</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>46179</td>
<td>46020</td>
<td>10.5</td>
<td>-8</td>
<td>24</td>
<td>11</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
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<td>Portugal</td>
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<td>31398</td>
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<td>1.7</td>
<td>3</td>
<td>5.7</td>
</tr>
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<td>-3</td>
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<td>15</td>
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<td>3.9</td>
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<td>5</td>
<td>4.8</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td>Namibia</td>
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<td>1</td>
<td>40</td>
<td>110</td>
<td>0.02</td>
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<td>10638</td>
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<td>6</td>
<td>4.6</td>
<td>0</td>
<td>5.7</td>
</tr>
<tr>
<td>Taipei, Chinese</td>
<td>10555</td>
<td>8135</td>
<td>2.4</td>
<td>15</td>
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<td>22</td>
<td>0.9</td>
<td>8</td>
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</tr>
<tr>
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<td>Netherlands</td>
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<td>14</td>
<td>2.4</td>
<td>2</td>
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</tbody>
</table>

Source: ITC calculations based on COMTRADE statistics.
In 2016, South Africa’s exports represented 0.4% of world exports for fish and aquatic invertebrates and its ranking in world export was 44. Table 2 shows that the total exported South African fish and aquatic invertebrates during 2016 was valued at US$ 441 641 000. South Africa exported greater quantities of fish and aquatic invertebrates to Italy, Spain and Hong Kong (China). The greatest share of South African fish and aquatic invertebrates exports were destined to Italy which commanded 19.3% share during the year 2016 followed by Spain and Hong Kong (China) with 17.8% and 10.5% shares respectively.

South African fish and aquatic invertebrates’ exports to the world decreased by 1% in value per annum between the periods 2012 and 2016. During the same period, exports value of fish and aquatic invertebrates to Italy increased by 10% and exports value to Spain increased by 2% and Hong Kong (China) decreased by 8% respectively.

Exports value of fish and aquatic invertebrates to the world increased by 12% during the period 2015–2016. During the same periods exports value to Italy increased by 32% and Spain increased by 19% while Hong Kong (China) increased by 24%.
Figure 27: Growth in demand for fish and aquatic invertebrates exported by South Africa in 2016

Source: Trademap, ITC
Figure 27 shows that between the periods 2012 - 2016 South Africa’s exports to United State of America (USA), United Kingdom, Japan, Spain, France, China, Hong Kong, Australia, Mozambique and Netherlands were growing at a rate that is less than their imports from the world. During the same periods South Africa’s exports to Viet Nam, Italy, Greece, Portugal, Singapore 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 Vietnam with South African exports to Vietnam growing at a rate of 50% per annum. The fastest growing import market is found in China and USA where their import growth is at 5% each per annum.
Figure 28: Prospects for market diversification for fish and aquatic invertebrates exported by South Africa in 2016

Source: Trademap, ITC
Most of South Africa’s fish and aquatic invertebrates were exported to Italy; nonetheless Figure 28 shows that Italy still imports more fish and aquatic invertebrates from the rest of the world than from South Africa. Italy has a world import market share of 4.5%. If South Africa wishes to diversify its fish and aquatic invertebrate’s exports, it can increase the markets of Korea because its annual growth of 6% though it’s small in size. Japan and USA are the biggest markets in the world with the world import market share of 9.9% and 15% 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 3: List of exporting markets for fish and aquatic invertebrates imported by South Africa in 2016

<table>
<thead>
<tr>
<th>Exporters</th>
<th>Value imported in 2016 (USD thousand)</th>
<th>Trade balance 2016 (USD thousand)</th>
<th>Share in South Africa’s imports (%)</th>
<th>Growth in imported value between 2012-2016 (% p.a.)</th>
<th>Growth in imported value between 2015-2016 (% p.a.)</th>
<th>Ranking of partner countries in world exports</th>
<th>Share of partner countries in world exports (%)</th>
<th>Total exports growth in value of partner countries between 2012-2016 (% p.a.)</th>
<th>Average tariff (estimated) applied by South Africa (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
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<tr>
<td>Morocco</td>
<td>30131</td>
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<td>1.1</td>
<td>6</td>
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<td>4</td>
<td>1</td>
<td>3.7</td>
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</tr>
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<td>2.9</td>
<td>1</td>
<td>3.5</td>
</tr>
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<td>Korea, Republic of</td>
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<td>1.5</td>
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<td>262</td>
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<td>1.3</td>
<td>-6</td>
<td>3.7</td>
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<tr>
<td>Mozambique</td>
<td>3154</td>
<td>4008</td>
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<td>-18</td>
<td>-16</td>
<td>97</td>
<td>0.4</td>
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<td>0</td>
</tr>
</tbody>
</table>

Source: ITC calculations based on COMTRADE statistics
In 2016, South Africa’s imports represented 0.2% of world imports for fish and aquatic invertebrates and its ranking in world export was 45. Table 3 shows that during 2016 South African imports of fish and aquatic invertebrates was valued at US$ 246 522 000. The main suppliers were Namibia, Morocco, Norway, India, China, New Zealand and Argentina, which commanded the shares of 26.4%; 12.2%; 11.5%; 11%, 6.9%, 5.3% and 4.2% respectively.

South African imports value growth rate of fish and aquatic invertebrates from 2012 to 2016 decreased by 1% per annum. At the same time imports value from Namibia decreased by 13% whilst Morocco and Norway increased by 157% and 12% respectively per annum during the same periods.

South African imports value of fish and aquatic invertebrates during the period 2015-2016 increased by 32%. Namibia, Morocco and Norway increased by 14%, 97% and 21% respectively during the same periods.
Figure 29: Competitiveness of suppliers to South Africa for fish and aquatic invertebrates in 2016

Source: Trademap, ITC
Figure 29 illustrates that between 2012 and 2016 South Africa’s fish and aquatic invertebrates’ imports from the Ecuador, India, Spain, USA, Namibia, Japan, and Mozambique 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, Argentina, Norway, Indonesia, Ecuador, New Zealand and Netherlands were growing at a rate greater than their export to the world.

India, Ecuador and Mozambique are most growing markets of fish and aquatic invertebrates with the annual export growth of 8%, 14% and 10% rate respectively. Netherlands was the most competitive export market to South Africa because South Africa’s annual imports of fish and aquatic invertebrates from Netherlands increased by 350% in 2016.
Figure 30: Prospects for diversification of suppliers for fish and aquatic invertebrates imported by South Africa in 2016

Source: Trademap, ITC
Figure 30 above shows the prospects for diversification of suppliers for fish and aquatic invertebrates by South Africa in 2016. 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 that South African fish and aquatic invertebrates producers can penetrate. Currently China and Norway’s shares on South African imports are at 6.9% and 11.5% respectively.

South Africa is already importing significant quantities of fish and aquatic invertebrates from Namibia, which is the fastest growing market. Namibia’s exports to South Africa increased by 26.36%.
6. **AQUACULTURE INDUSTRY BODIES**

**Overarching Aquaculture Sector Association:**

a) Aquaculture Association of Southern Africa (AASA)
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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:

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Fax: +27-28-312-2288
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Tel: 021 556 7339

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i) South African Koi Traders Association (SAKTA).
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The following organizations are to be acknowledged:

a. Aquaculture Association of South Africa.
   www.aasa-aqua.co.za

b. Competition Commission
   www.comtrib.co.za

c. FAO
   www.fao.org

d. Statistics and Economic Analysis
   www.daff.gov.za

e. Oceana
   www.oceana.co.za

f. Premier Fishing.
   www.PremierFishing.co.za

g. Quantec.
   www.quantec.co.za

h. Trade and Industrial Policy Strategies (TIPS)
   www.tips.org.za

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