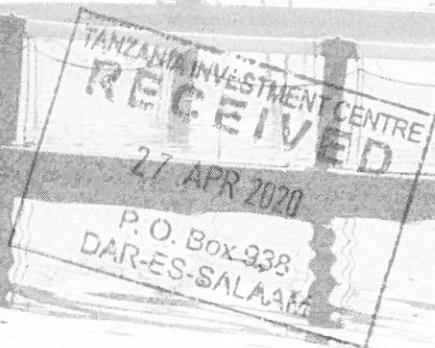




Business Plan for
Tanlapia Limited -Bagamoyo Region,
Tanzania.

Freddy Lapentti M. MBA. | TANLAPIA Ltd, TANZANIA. | Monday, March 16, 20



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**ABBREVIATIONS
AND
ACROYNMS**

ABBREVIATIONS AND ACROYNMS

AfDB	Africa Development Bank
BOT	Bank of Tanzania
CAGR	Compound Annual Growth Rate
CBD	Central Business District
CEO	Chief Executive Officer
CFO	Chief Finance Officer
CSR	Corporate Social Responsibility
CTO	Chief Technical Officer DGM
Deputy General Manager DSFA	Deep
Sea Fishing Authority DRC	
Democratic Republic of Congo EAC	
East African Community	
EEZ	Exclusive Economic Zone
EU	European Union
FM	Farm Manager
FAO	Food and Agricultural Organization
FCR	Food Conversion Ratio
FDI	Foreign Direct Investment
FETA	Fisheries Education Training Agency
Forex	Foreign Exchange
GDP	Gross Domestic Product

GM	General Manager
ICT	Information and Communications Technology
IMF	International Monetary Fund
IRR	Internal Rate of Return
MoF	Ministry of Finance
MALF	Ministry of Agriculture, Livestock and Fisheries
MT	Metric Tonnes
MSY	Maximum Sustainable Yields
NEMC	National Environment Management Council
NPL	Non-Performing Loans
NPV	Net Present Value
OECD	Organization of Economic Cooperation and Development
SME	Small and Medium Enterprises
SWOT	Strength, Weakness, Opportunities and Threats
TAFIRI	Tanzania Fisheries Research Institute
TRA	Tanzania Revenue Authority
TIC	Tanzania Investment Center
TIN	Tax Payers Identification Number
TZS	Tanzania shilling
UNCTAD	United Nations Conference on Trade and Development
USD	United States Dollars
VAT	Value Added Tax

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

i) Business Opportunity

Tanlapia Limited Company has identified a business opportunity in the fish farming business. According to FAO, the Africa Region and Global per capita fish Supply was 10.1 kgs and 19.8 kgs respectively and for Tanzania it was a low 7.2 kgs. Assuming that Tanzania increased its consumption amount to equal the World Health Organization's recommended per capita consumption of 14.0 kgs, then this would result in additional annual demand of 361,000 Metric Tonnes (MT).

ii) Project Promotors

Tanlapia Limited

Tanlapia are owners of a 500 Hectare farm site close to the River Ruvu in Bagamoyo, Tanzania.

The Project Sponsor is Mr. Ali Mawji, Chairman of Goldstar Paints Ltd and one of the sector's industry leaders with 35 years of experience in the business world of Tanzania. He is an active investor in several companies with an extensive professional network and has a BSc in Economics from the London School of Economics.

Javed Mawji is a project leader in green and sustainable technologies, with over 15 years' experience developing projects in Tanzania, the Czech Republic and the UK, from initial concept through to fund raising and operations. He holds a BA in Philosophy and Economics from University College London and an MBA from Edinburgh University.

Mr. Freddy Lapentii will be the CEO and has more than 20 years of experience in the aquaculture industry, in East Africa and Latin America, specifically in tilapia and shrimp production. He led the largest tilapia cage farm in East Africa, Victory Farms located in Kenya, developing and implementing an expansion plan that tripled tilapia output in only 8 months. He was in charge of production, operations, logistics and administration, managing 150 local employees and a team of 5 managers; accomplishing a 266% increase in total biomass.

Before this, he managed the major tilapia group in Ecuador, with a production of 12,000 tons per year of tilapia and 1,300 tons per year of shrimp in poly-cultivation ponds associated with tilapia, supervising almost 350 employees. Freddy was in charge of innovations and changes in the groups feeding, harvest and post-harvest systems as well as the relationship with suppliers and customers. He has a MBA

from Universidad Antonio de Nebrija

(Spain) and a BSc in Agriculture from Escuela Agrícola Panamericana El Zamorano (Honduras).

iii) Description of Project

A detailed Technical Feasibility study has been undertaken and established that technically it is possible to establish fish farms.

Project 1 - *O. niloticus* (NMT Nile Tilapia).

Production starting at 1,500 MT/Annum in year 1 scaling up to 4,000 MT/Annum by Year 3.

iv) Consolidated Financing Plans.

The total project is estimated to cost USD 5,100,000.00 and will be financed by both debt and equity as described in Figure A below.

Figure A - Consolidated Capital Structure

Description	Totals	%
Equity- Non-Cash (Land etc)	2,500,000	
Equity - Cash	835,000	
Total Equity	3,335,000	30%
Total Debt	1,765,000	70%
Total Funds	5,100,000.00	100%

v) Consolidated Investment Plan.

The capital expenditure funds raised will be applied towards the following activities/ assets.

Working Capital Budget

The operations of a fish farm require a significant working capital budget as operating costs are incurred for 6 to 8 months before any revenue income streams start to flow. As a result, the working capital finance is estimated a USD 500,000 for Phase 1.

v) Social Economic Outcomes

The social economic impact of this project includes improved socio-economic status by directly creating up to 64 high wage employment opportunities for the local communities and a further 700 indirect employment. New synergies between the commercial fish farm and rural fish farms, where local farmers readily have access to high quality fingerlings through the hatchery and the commercial fish farm can increase output by purchasing directly from local farmers for processing.

In addition, there will be the transfer of knowledge and technology from the commercial fish farm to rural aquaculture farmers through on-site training facility. The Project is also expected to generate positive externalities by promoting the development of transportation, schools, clinics access to freshwater and electricity in the community. Fish is one of the highly recommended sources of animal

protein. The availability of quality fish and at a reasonable price will encourage more fish eating and thereby improving generally the health - being of the population.

vi) Conclusion

On the basis of the significant fisheries products supply deficit, healthy projected financial returns coupled with many positive social economic contributions, it is recommended that the Tilapia project be implemented.

1. INTRODUCTION

1.1 Business Opportunity

Tanlapia Limited (Tanlapia) is a limited company based and registered in Tanzania. The company has identified a great opportunity in the fish farming business. According to FAO, the Africa Region and Global per capita fish Supply was 10.1 kgs and 19.8 kgs respectively and for Tanzania it was a low 7.2 kgs. Assuming that Tanzania increased its consumption amount to equal the World Health Organization's recommended per capita consumption of 14.0 kgs, then this would result in additional annual demand of 361,000 Metric Tonnes (MT).

Tanlapia has already acquired a 500 hectares land located at Bagamoyo that is 75 kms north of the country's commercial capital of Dar Es salaam.

A detailed Technical Feasibility study has been undertaken and recommends the establishment of the following: -

Project 1 - *O. niloticus* (NMT Nile Tilapia).

The use of 5 X 8 Ha ponds in raceways with land-based hatchery with fingerlings grow out ponds. Expected fish density of 60-80kgs/ cubic meter **and** starting at 1,500 MT in year 1 scaling up to 4,000 MT by Year 3.

Other Initiatives

Social Inclusion Programme.

The social inclusion program for the neighbouring communities will also be established. In particular, women will be encouraged to participate. The key specie will be Crab . This program will operate independently but with full support of Tanlapia.

1.2 Project Promotors

i) Tanlapia Limited

Tanlapia are owners of a 500 Hectare farm site close to the River Ruvu in Bagamoyo, Tanzania.



The Project Sponsor is Mr. Ali Mawji, Chairman of Goldstar Paints Ltd and one of the sector's industry leaders with 35 years of experience in the business world of Tanzania. He is an active investor in several companies with an extensive professional network and has a BSc in Economics from the London School of Economics.

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ponds associated with tilapia, supervising almost 350 employees. Freddy was in charge of innovations and changes in the groups feeding, harvest and post-harvest systems as well as the relationship with suppliers and customers. He has a MBA from Universidad Antonio de Nebrija (Spain) and a BSc in Agriculture from Escuela Agrícola Panamericana El Zamorano (Honduras).

1.3 Business Plan Format

This plan commences with a review of Tanzania's macro-economic environment that the fish sector operates in and any key drivers that may directly or indirectly influence this sector's operations. In view of the globalisation of world economies and trade, subsequent chapters review the Global and Africa region fish sector performance indicators and trends. This review is considered essential as events occurring in the fishery sector in one part of the world may have a significant impact on the operations of other producing nations, particularly in terms of pricing structures and market opportunities.

Another chapter reviews the trends in the Tanzania fish sector. Trends in both quantitative and qualitative areas are discussed with the objective of identifying all major challenges and opportunities. This document also describes in detail the various risks involved with this project and concludes with a financial and socio-economic outcomes analysis.

2. TANZANIA ECONOMIC OVERVIEW

2.1 Introduction

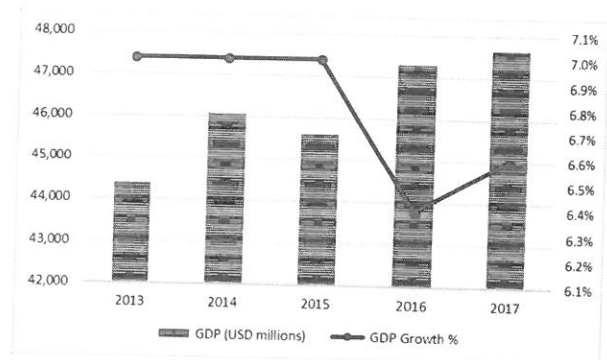
This Chapter discusses the macro economic trends of the Tanzania economy with the objective of assessing possible implications to the fisheries sub sector and the proposed project in particular.

2.2 Gross Domestic Product (GDP)

The World Bank estimated that in 2017, Tanzania's total population was 55 million people and GDP at current market prices amounting to USD 47.6 billion. During 2017, the economic growth rate was 6.6% which was equal to the country's 10-year average. This rate is significantly higher than the rates achieved by other East Africa Community (EAC) countries.

In the recent past, the economic growth has been driven by increased investment in infrastructure, a stable supply of electricity improvement in transport services coupled with favourable weather conditions that resulted in an increased harvest of food and other crops.

Figure 2.1- GDP



Source: BoT Monthly Economic Report- April 2019.

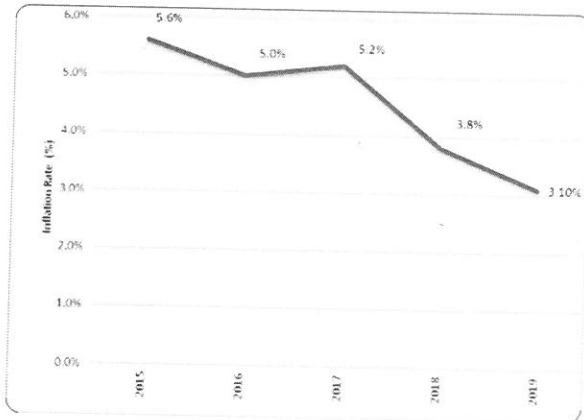
The agricultural sector is the largest and contributes a significant 28.5% of the GDP. It employs over 75% of the work force and has continued to register growth rates that are lower than that of the overall economy. The consistently lower than average growth rate of the agricultural sector explains the relatively slow decline of poverty in the rural areas and also the accelerated pace of rural to urban migration.

2.3 Inflation

Figure 2.2 below provides inflation trends in Tanzania and in March 2019, the headline inflation rate was a low 3.1%. This reflects the continuing decline in the headline inflation over the past five years.

The decline in the rate of inflation has been achieved largely through the application of prudent monetary and fiscal policies coupled with favourable weather that has resulted in good cash and food crops harvests.

Figure 2.2- Inflation Rate

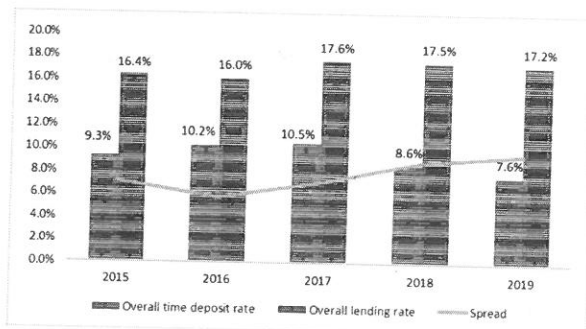


Source: BoT Monthly Economic Report- April 2019.

2.4 Interest Rates

Figure 2.3 below depicts trends in the Tanzania shillings interest rates regime.

Figure 2.3- Interest Rates



Source: BoT Monthly Economic Report- April 2019.

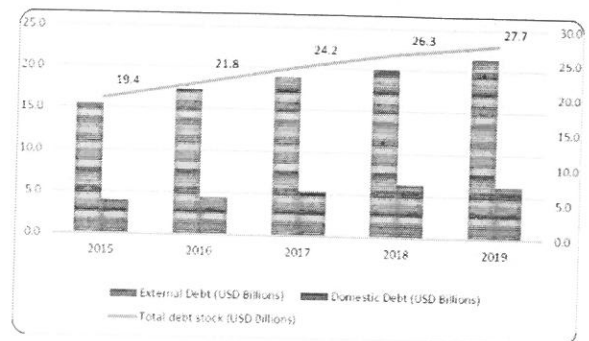
The overall average Tanzania shilling lending rate as of March 2019 was 17.2% that is still considered expensive and has generally reduces the demand for credit. The Bank of Tanzania has loosened monetary policy in 2018 to address liquidity constraints and support further private sector credit growth. The interest spread remains high at over 7.0% and this has been attributable to the high non-performing loans (NPLs).

2.5 Public Debt and Debt Service

As a result of the low level of collections of domestic revenues; the Government has financed its funding gap through borrowings from both domestic and international markets. Consequently, public debt has risen to United States Dollars (USD) 27.7 billion.

The December 2016 International Monetary Fund (IMF) - Debt Sustainability Analysis Report put the Country at low risk of debt stress.

Figure 2.4- Public Debt

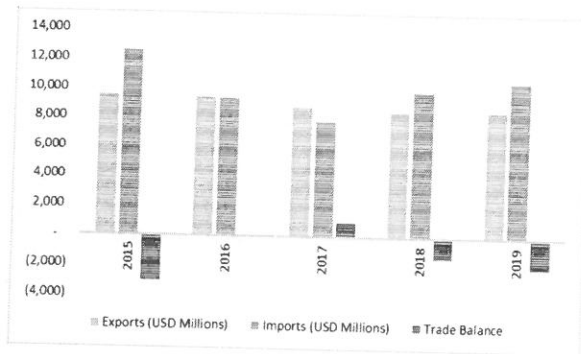


Source: BoT Monthly Economic Report- April 2019.

2.6 External Trade

The external trade trend is summarised in Figure 2.5 below.

Figure 2.5- External Trade Balance Trends



Source: BoT Monthly Economic Report- April 2019.

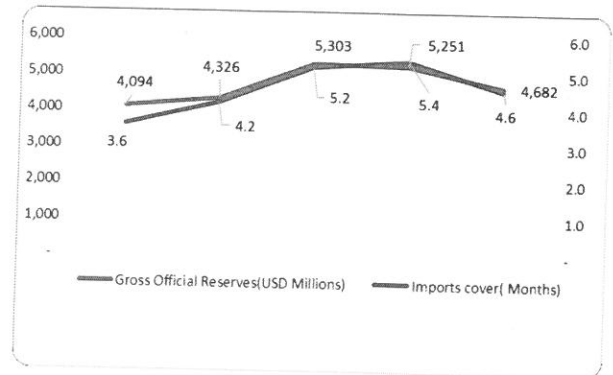
The value of exports of goods and services has recorded some small decline over the past 5 years. The key exports include travel (tourism) receipts, export of gold and manufactured goods.

The value of imports has increased over the past two years and this is related to the importation of construction materials for railways, airports, ports and road projects currently being undertaken by the Government.

2.7 Foreign Exchange (Forex) Reserves

As is noted in Figure 2.6 below, in March 2019, the country's level of international reserves amounted to USD 4,682 million that equates to 4.6 months of import cover.

Figure 2.6- Forex Reserves



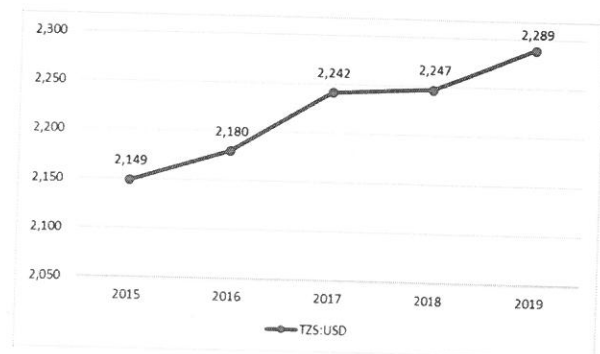
Source: BoT Monthly Economic Report- April 2019.

The level of forex reserves is considered satisfactory as the East African Monetary Protocol recommends a minimum rate of 4.5 months import cover. This suggests that there are sufficient forex reserves to support any importation that may be required for this project.

2.8 Forex Rates

Over the past five years, the Tanzania Shilling (TZS) has depreciated at an annualised rate of 1.6 %.

Figure 2.7- Exchange rate TZS: USD



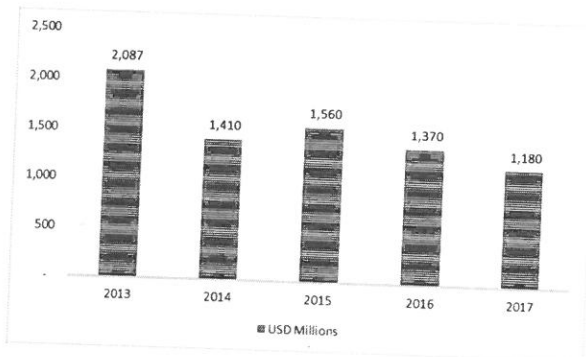
Source: BoT Monthly Economic Report- April 2019.

As the Project intends to borrow funds in foreign currencies, it will be particularly important that the proper mitigation measures are put in place to minimise potential forex related rates risks.

2.9 Foreign Direct Investment (FDI)

The level of FDI underscores the confidence that investors generally have for Tanzania. The 2018 World Investment Report published by UNCTAD noted that in 2017, Tanzania received FDI amounting to USD 1,180 million. The World Bank reports that FDI as percentage of GDP has fallen from 3.9% in 2016 down to 2.3% in 2017.

Figure 2.8- FDI



Source: UNCTAD-World Investment Report - 2018

2.10 Ease of Doing Business Ranking

The recently released Ease of Doing Business 2019 Report by the World Bank ranks Tanzania at number 144 (of 190 countries surveyed) a drop 7 spaces from

the previous year's ranking of 137. Clearly a lot of work needs to be done to improve the overall business environment.

2.11 Official Development Assistance (ODA)

The World Bank reports that in 2017, Tanzania received ODA amounting to USD 2.584 billion. This amount is significant and renders the country vulnerable to global economic shocks.

2.12 Short and Medium-Term Implications for the Fisheries sub sector.

In its 2019 Report, the International Monetary Fund (IMF), indicated that the GDP growth rate would reduce to 4.4% in 2019. The Government is however, confident that the current grow rate of 6-7% will be maintained in the near future. As a result, therefore, per capita GDP is expected to continue to increase accordingly implying the general increase in the purchasing power of the general population. Increased income levels will result in more money being spent on food products including the protein rich fisheries products.

A black and white photograph showing several fish, likely salmon, lying on a bed of crushed ice. The fish are arranged diagonally across the frame, with their scales and fins clearly visible. The background is a textured surface of ice. The text 'GLOBAL FISHERIES SECTOR OVERVIEW' is overlaid on the right side of the image in a bold, serif font.

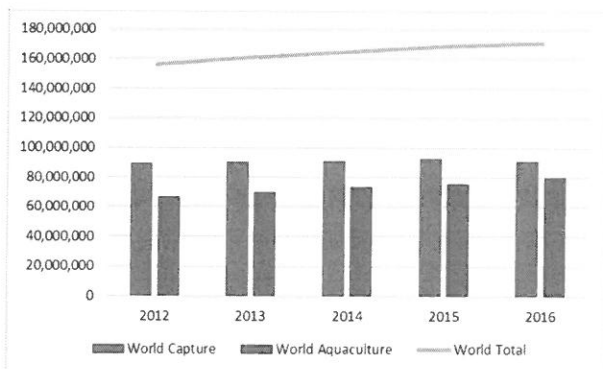
**GLOBAL
FISHERIES
SECTOR
OVERVIEW**

3. GLOBAL FISHERIES SECTOR OVERVIEW

3.1 Global Fish Production.

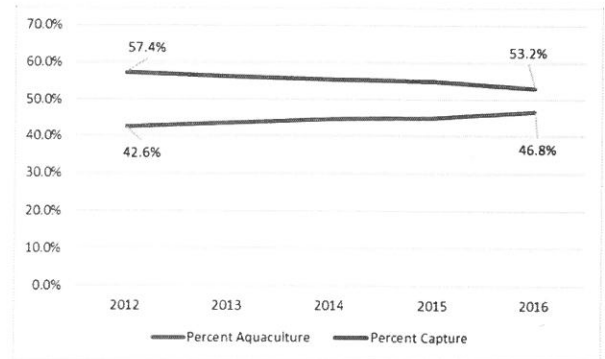
The Food and Agriculture Organization (FAO) - Fishery and Aquaculture Statistics 2016 Report published in 2018, noted that the global production of fish and other aquatic animals grew in 2016 to reach 170.9 million tonnes. Of the total global production, 53.2% (90.9 million tonnes) was capture production. The remaining 46.8% (80.0 million tonnes) was from aquaculture. Figure 3.1 and 3.2 below provides production trends over the past 5 years.

Figure 3.1- Global Production Trends- Tonnes



Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018)

Figure 3.2- Global Fishery Production Trends- Capture Vis Aquaculture.



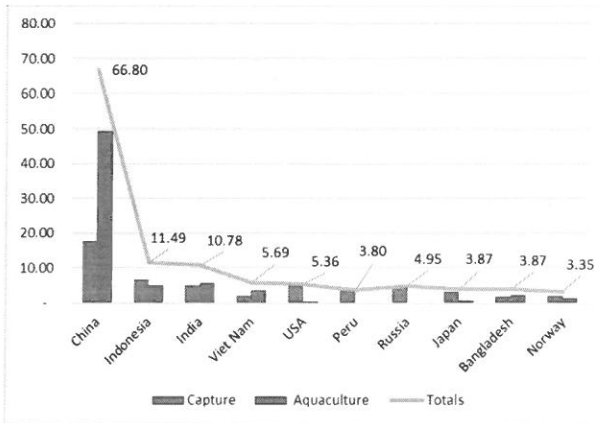
Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018)

During the period 2000 to 2016, the proportion of fish produced through aquaculture has increased significantly from 25.7% to 46.8%.

3.2 Top Ten Producer Countries.

Figure 3.3 provides details of the top ten fish producers in the World in 2016. It will also be observed that these countries contribute 70.2% of global production. China is the leading fisheries production nation with a significant market share of 39.1%.

Figure 3.3- World Top 10 Producers-2016 (MT Millions)



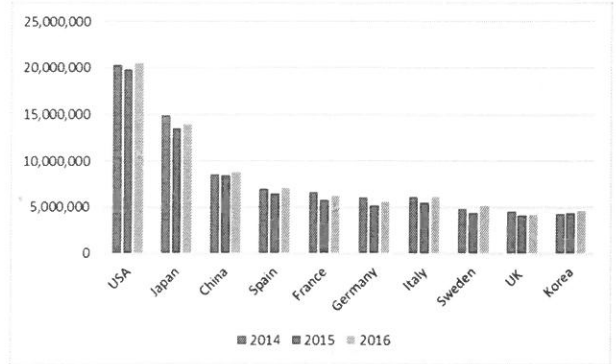
Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018)

3.3 Global Fish Trade.

Imports

As of 2016, the global import market amounted to USD 135.0 billion. The top ten importers are shown in Figure 3.4 below made up 60.9% of total global imports. Six countries out of the top ten fish importers are members of the European Union (EU). Consequently, if they were considered a single entity the EU would be the largest import regional block.

Figure 3.4 Global Trade – 10 Largest Importers In 2016.

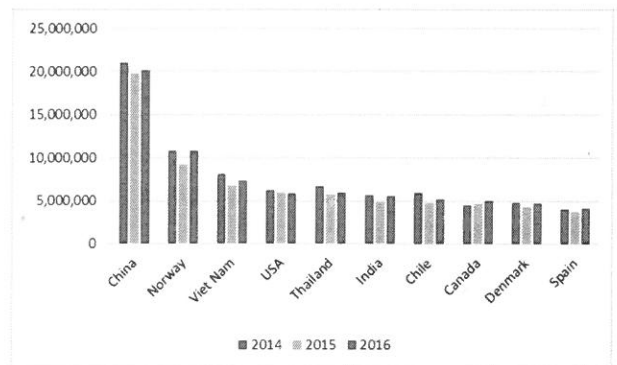


Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018).

Exports

The top 10 exporting countries listed in the Figure 3.5 below amounted to 52.3% of the global export trade. Countries with the highest number of export values are spread across the globe with China being the leading exporter with a global market share of 14.1%.

Figure 3.5 Global Trade - 10 Largest Exporters In 2016.



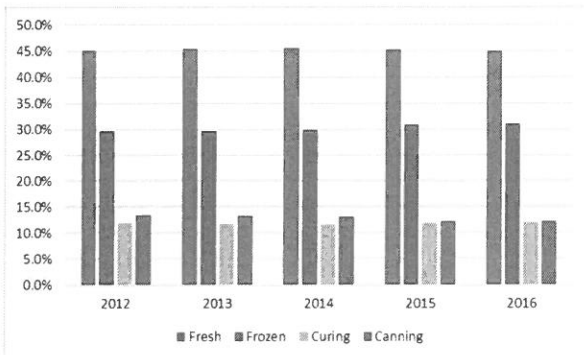
Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018)

3.4 Disposition of Global Fishery Production.

FAO estimates that in 2016, 88% of global fisheries production was for human consumption, the balance of 12% was used for the production of animal feeds and fish oil.

Figure 3.6 indicates the various form/state the human consumed fish is sold. It will be noted that 44.9% of all the fish consumed by humans is sold in its fresh state; whilst the frozen fish make up an additional 31.0%.

Figure 3.6 – Disposition of Global Fishery Production.



Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018).

3.5 Fishery Fleet and Employment.

In 2016, the world fishing fleet consisted of 4.6 million vessels of which 61% were motorised.

FAO noted that as of 2016, 59.6 million were engaged in the fisheries sector of which 32% were engaged in aquaculture. **Women accounted for only 14% of the total fisheries employment.**

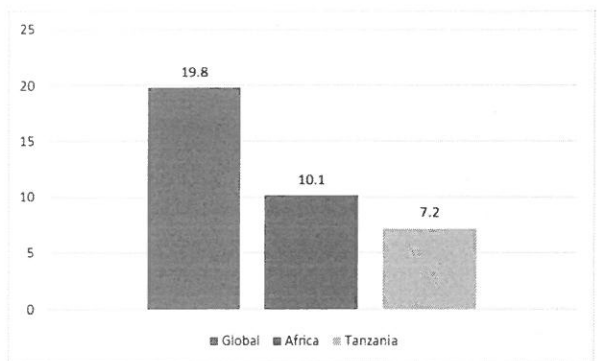
3.6 Comparative Per Capita Fish Supply.

During the period 1980 to 2013, FAO indicates that the global per capital fish Supply has grown by CAGR of 14.5% to reach 19.8 kgs as of 2013.

Globally fish provides about 3.2 billion people with almost 20% of their average per capita intake of animal protein and 5.1 billion people with 10% of such protein.

As of 2013, the per capita Supply for Africa Region was 10.1 kgs; Tanzania recorded 7.2 kgs.

Figure 3.7 -2016 Per Capita Fish Supply (Kgs)



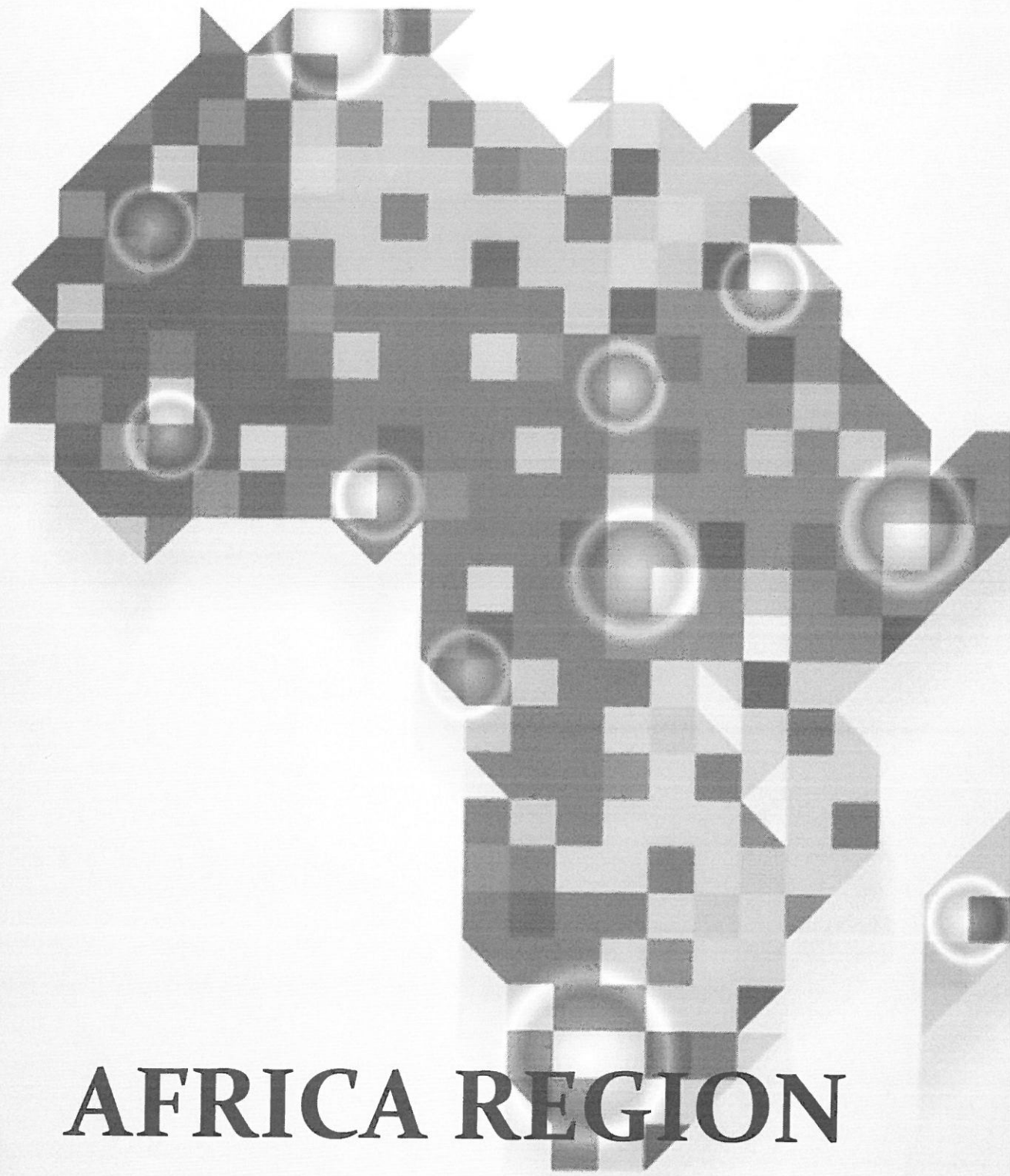
Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018).

3.7 Global Outlook.

In its report; Prospects for Fisheries and Aquaculture - Fish to 2030, the World Bank projects that the global fish production will increase to 186 million tonnes by the year 2030, representing a CAGR of 0.7%. This growth will be driven by general population growth coupled with increases in the per capita consumption of fisheries products. The latter being largely related to health benefits attributed to fish as a better source of protein.

Many countries have reached the capture production limit and indeed most are concerned about over fishing. As a result, therefore, the additional fisheries production will need to be largely driven by aquaculture production.

China remains the dominant player in both production and export trade. The impact of the Chinese fish trade within the East Africa region will need to be carefully monitored.



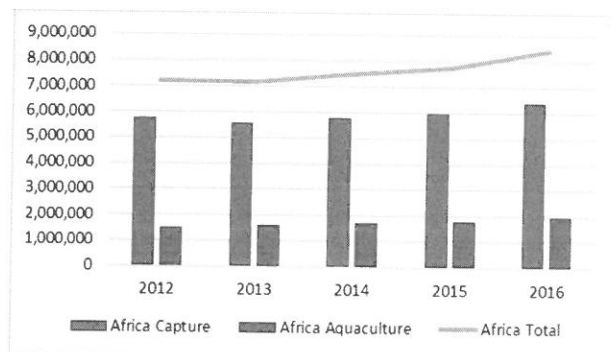
**AFRICA REGION
FISHERIES
SECTOR OVERVIEW**

4. AFRICA REGION FISHERIES SECTOR OVERVIEW

4.1 Africa Region Fish Production.

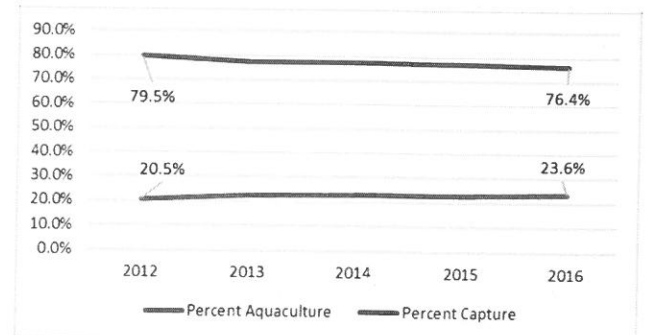
Figure 4.1 summarises the fish production trends for the Africa region. It is observed that during the period 2012 to 2016, Africa region's total production grew a CAGR of 3.82% to reach 8.4 million tonnes. However, the 2016 production level equals to only 4.9% of global production.

Figure 4.1 Africa Region- Fish Production- Tonnes.



Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018)

Figure 4.2 Africa Region- Fish Production Mix - Tonnes.



Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018)

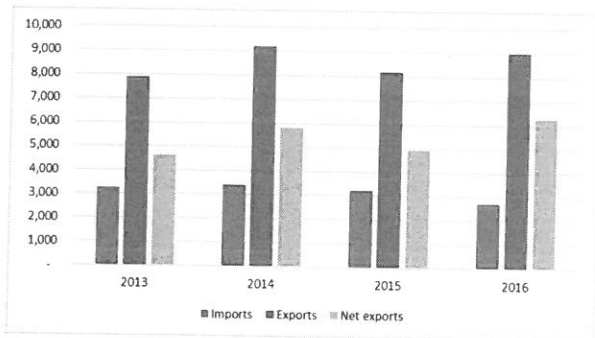
As of 2016, captured fish production contributed a significant 76.4% of total production whilst aquaculture made up the balance of 23.6%. This contrast sharply with the global figures and indicates that Africa as a whole is behind on the aquaculture operations. However, the figures portray an encouraging trend. For the period 2012 to 2016, the CAGR for Africa Region fisheries production was 3.82%. Capture recorded a CAGR of 2.8% whilst aquaculture grew at an impressive 7.5%.

4.2 Africa Region – International Trade.

As is noted in Figure 4.3 below, the Africa region is a net exporter of fish.

increased to equal the global per capita supply of 19.8 kg, then production would have to be increased from the current 8.4 million MT to 16.5 million MT (an increase of 96%).

Figure 4.3 Africa Region – International Trade.



Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018).

4.3 Africa Region - Per Capita Fish Supply.

According to FAO, as of 2013, the Africa Region per capita fish supply was 10.1 kgs (global per capital fish supply 19.8 kgs) and translates to only 51% of the global average.

4.4 Africa Region Outlook.

A combination of over fishing beyond the sustainable limits of ecosystems and environmental mismanagement has devastated Africa's captured fisheries industry, resulting in unemployment and food security concerns. Therefore, in the future, additional fisheries production will be largely driven by aquaculture production.

Should the Africa Region supply be

TANZANIA FISHERIES SECTOR OVERVIEW





5. TANZANIA FISHERIES SECTOR OVERVIEW

5.1 Government Regulators

The key Government Regulators are the: -

- Ministry of Agriculture, Livestock and Fisheries (MALF); and
- Marine Parks and Reserve Unit.

5.2 Institutions

- The Deep-Sea Fishing Authority (DSFA);
- The Tanzania Fisheries Research Institute (TAFIRI); and
- Fisheries Education Training Agency (FETA).

5.3 Legislation and Regulations.

The fisheries sector is governed by the following Legislative and Regulatory framework:

Fisheries Act (CAP 279)

This Act provides for sustainable development, protection, conservation of the fisheries sector including aquaculture. It also provides regulations and control of fish and fishery products, aquatic flora and related matters.

Marine Parks and Reserves Act (CAP 146)

The Act promotes the sustainable management of critical marine resources and habitats through community participation. It also aims at promoting, protection and conservation of fisheries resources and aquatic environment for the sustainability of the resources.

Deep Sea Fishing Authority Act (CAP 388)

This Act provides for the establishment of the Deep-Sea Fishing Authority (DSFA) which is responsible for the regulation, licensing, fishing, monitoring and surveillance in the Exclusive Economic Zone (EEZ).

5.4 Policy Documents

National Fisheries Policy.

In 2016, MALF published the National Fisheries Policy 2015. Its overall objective being the development of a robust, competitive and efficient fisheries sector that contributes to food security and nutrition, growth of the national economy, improvement of the well-being of fisheries stakeholders while conserving the environment.

National Aquaculture Development Strategy.

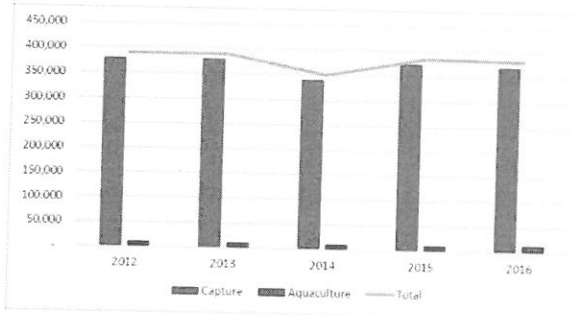
This document covers the period 2008/9-2022/3 and provides the framework in which the aquaculture industry in Tanzania can be developed in an

economically, socially and environmentally sustainable manner.

5.5 Tanzania Fish Production Trends.

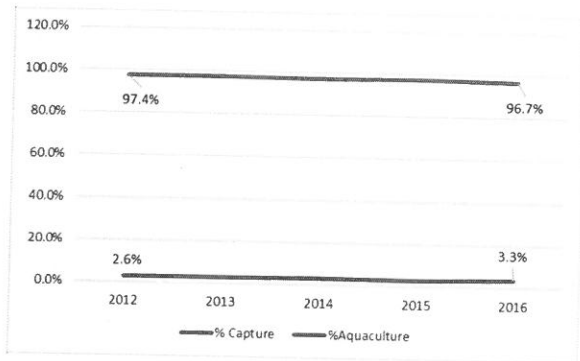
The fisheries production figures for Tanzania are shown in Figures 5.1 and 5.2. The total fisheries production in 2016 was 382,550 MT with aquaculture production contributing a small 3.3%.

Figure 5.1 Tanzania Fish Production- Tonnes.



Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018).

Figure 5.2 Tanzania Production Mix.

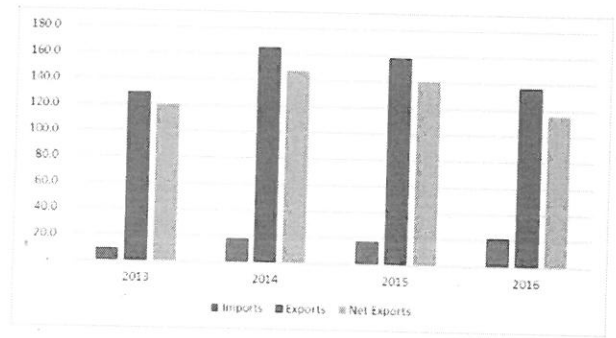


Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018)

5.6 International Trade

As will be noted in figure 5.3 below, Tanzania's international fisheries trade is fairly small but the country is a net exporter of fisheries products.

Figure 5.3 Tanzania's International Trade (USD Millions).



Source: FAO Fishery and Aquaculture Statistics 2016 Report (Published 2018)

It is observed that the value of exports has been declining in the recent years. This has been attributed to the reduction in the capture of the Nile perch that has traditionally been Tanzania's key export fish species. This declined is related to over exploitation of fisheries products in the country generally.

5.7 Fishers and Fishing Vessels

The FAO Report of 2018 states that in 2016, there were 203, 529 people directly engaged in the fishery trade. There was also a total of 57,291 fishing vessels of which only 20% were motorised.



The fisheries sub-sector supports an estimated 4 million people through its entire value chain of processing, trading, fish transportation, net making and boat building etc.

5.8 Tanzania Per Capita Fish Supply.

According to FAO, Tanzania's per capital fish Supply was 7.2 kgs (Africa Region at 10.1 kgs and global at 19.8 kgs).

5.9 Key Characteristics of the Fisheries Sector

a) Contribution to the National Economy.

The fisheries sector is relatively small and contributes an estimated 2.6% of the GDP.

However, the fisheries sector has an important role to play in the economic and social well-being of the country, in particular, in the supply of animal protein, income generation, employment and recreation, tourism and importantly food security.

Fish production is mainly designated for domestic consumption with a small 10% being exported.

b) Major Species

The most notable species are; Nile perch (*Lates niloticus*), Tilapia (*Oreochromis niloticus*), and lake sardines locally known as dagaa (*Rastrineobola argentea*).

The other main species are octopus, tuna, kingfish, catfish, shrimps.

c) Existing Fisheries Resources Base.

Tanzania is endowed with substantial inland and marine fishery resources. There is approximately 64,500 square kilometers of inland water surface area distributed among the large lakes, including Lake Victoria (35,088 sq.km), Lake Tanganyika (13,489 sq.km), Lake Nyasa (5,760 sq.km) and Lake Rukwa (3,000 sq.km). In addition to the inland fisheries, the country has a 1,424-kilometer shoreline with a territorial sea area of 64,000 sq.km and the EEZ covers an additional 223,000 sq.km.

d) Fisheries Sector Structure

i) **Inland Fisheries** account for 85% of the natural fish production in 2016. Lake Victoria and Lake Tanganyika alone accounts for 94% of the total inland fish production. Inland fishing is mainly undertaken by entirely by artisanal fishermen who use small boats and canoes and the main type of gear is gill nets.

ii) **Marine territorial waters** fisheries are undertaken by both artisanal and



industrial fishermen. The artisanal fishermen use small boats and canoes and their main gear being gill and shark nets. The catch consistent of mainly fin fish and shrimps.

Industrial fishermen basically target shrimps and use trawlers for the export market.

An estimated 90 % of the marine fish production comes from fishing within the territorial sea.

iii) Marine EEZ. The marine industrial operates both within the territorial waters and the EEZ. The main species caught are shrimps and lobsters and crabs, tuna, marlin, sword fish and sharks. This fishery is solely industrial and the bulk of the catch is exported and is undertaken by licensed foreign vessels.

e) Industrial Fish Processing

There are 10 processing plants in Tanzania authorised for international exports of Nile perch (compared to 14 in Uganda, and 4 in Kenya). Nile perch provides substantial white flesh which is readily filleted and is in good demand on the international markets. All these establishments are compliant with EU hygiene rules and are certified to ISO 22000BRC.

The Tanzania factories have a combined capacity to process an average 500 tonnes of raw fish day. The recent decline in catches has led to most plants operating at reduced capacity of as low as 25%.

Furthermore, the international market for Nile perch has been adversely affected by the rise of other cheaper species from the Asian aquaculture.

5.10 Key Characteristics of Aquaculture

a) Contribution to the economy

At present, aquaculture is largely a subsistence activity practiced by the poor households in the coastal and inland areas. However, there are benefits that include; contribution to peoples' requirement for animal proteins, provides employment opportunities and is a source of income.

The aquaculture sub sector is fairly small with annual production of only 3.3% of total 2016 fish production. This sub sector includes tilapia, trout, freshwater catfish and a small marine aquaculture producing milkfish and prawns.

b) Production systems/ Techniques

Aquaculture production is practised in two environments ; namely fresh water and marine waters.

The production systems of aquaculture include ponds, small tanks and raceways. Production from ponds is mainly practiced with small ponds of an average size of 150 sqm.

Aquaculture feed is basically from owners made, domestic manufactures and imported feed. Fingerlings are also domestically sourced.



Tanlapia

c) Cultured Species.

Freshwater aquaculture involves mainly Nile tilapia but catfish is also popular.

Marine aquaculture has the potential for the production of species such as milk fish, sea cucumbers; shrimps, crabs, oysters. Seaweed farming has taken root in Zanzibar and has attracted a lot of interest.

5.11 Permits and Licensing Procedures.

To start and run a fish farm requires compliance with various legislation. The necessary permits and licences procedures are highlighted below:

- a) Project Promoters must identify proposed fishing site(s);
- b) Should the proposed sites be near a village then the Village Council must sit and provide written consent. Typically, this would include some Corporate Services Responsibilities (CSR) related promises such as construction of class rooms, health facilities building or improvement of other public infrastructure as roads etc.
- c) Application to TAFIRI who will undertake a technical feasibility study on the proposed site(s) and advises both the Director of Fisheries Department (MALF) and the relevant Water Basin Authority on technical viability of the proposed project on the preferred sites.
- d) In the event, the project is considered large, then a full Environment and Social Impact Assessment Report will require to be submitted to NEMC. Once report is approved by NEMC, they advise the Director of Fisheries accordingly.
- e) If satisfied, The Director of Fisheries Department will issue the fishing licence.

5.12 Tanzania Fisheries Outlook.

- a) The demand for fisheries products in Tanzania is much higher than current supplies. Assuming that Tanzania increased its consumption amount to equal the World Health Organization's recommended per capita consumption of 14.0 kgs, then this would result in additional annual demand of 361,000 MT.
- b) With a population growth of 2.7% per annum, increased supply will be needed to simply maintain the current limited contribution to diet;
- c) The captured production has plateaued and future incremental production will need to come from aquaculture;
- d) Short and medium-term GDP growth rate of 4-7% should result in increased purchasing power for food products and in particular fisheries.

6. SWOT ANALYSIS

6.1 Strengths

- Established Regulatory structure in the Industry;
- The establishment of Beach Management Units at fish landing sites;
- The existence of various fishery industry bodies across the sector;
- Existence of various vocational training institutions across the country;
- Well-developed fish processing facilities by Lake Victoria.
- A very enthusiastic team of Projector Sponsors with strong entrepreneurial characteristics;
- Utilities such as water and electricity from the national grid are also easily accessible;
- The Project will be implemented under the Built Operate model.

6.2 Weaknesses

- Lack of quality feed and fingerlings for aquaculture production;
- Lack of fish storage facilities;
- Inadequate aquaculture information, technology, research and development;
- Outdated fishing and aquaculture infrastructure and facilities;
- Inaccessibility to markets and long marketing chain in the export market;
- Insufficient skills for aquaculture production;
- Declining capture fish, in particular around Lake Victoria, has resulted in excess processing capacities for existing processing factories;
- High cost of quality feed (usually imported)
- Lack of credit facilities to fish farmers and at a reasonable interest rate.
- Lack of aquaculture extension officers.

6.3 Opportunities

- Aquaculture production of high value species such as prawns, and shrimps for the export market as well as Nile tilapia which has high domestic and regional demand.
- Opportunities exist in the capture fisheries in the EEZ in particular tuna species;
- Development of the tropical aquarium fish market;
- Investment in the fish processing such as canning, fish feed and smoking;
- Manufacture of and supply of fishing crafts, gears and pond structures;
- Modern hatcheries for fingerlings production;



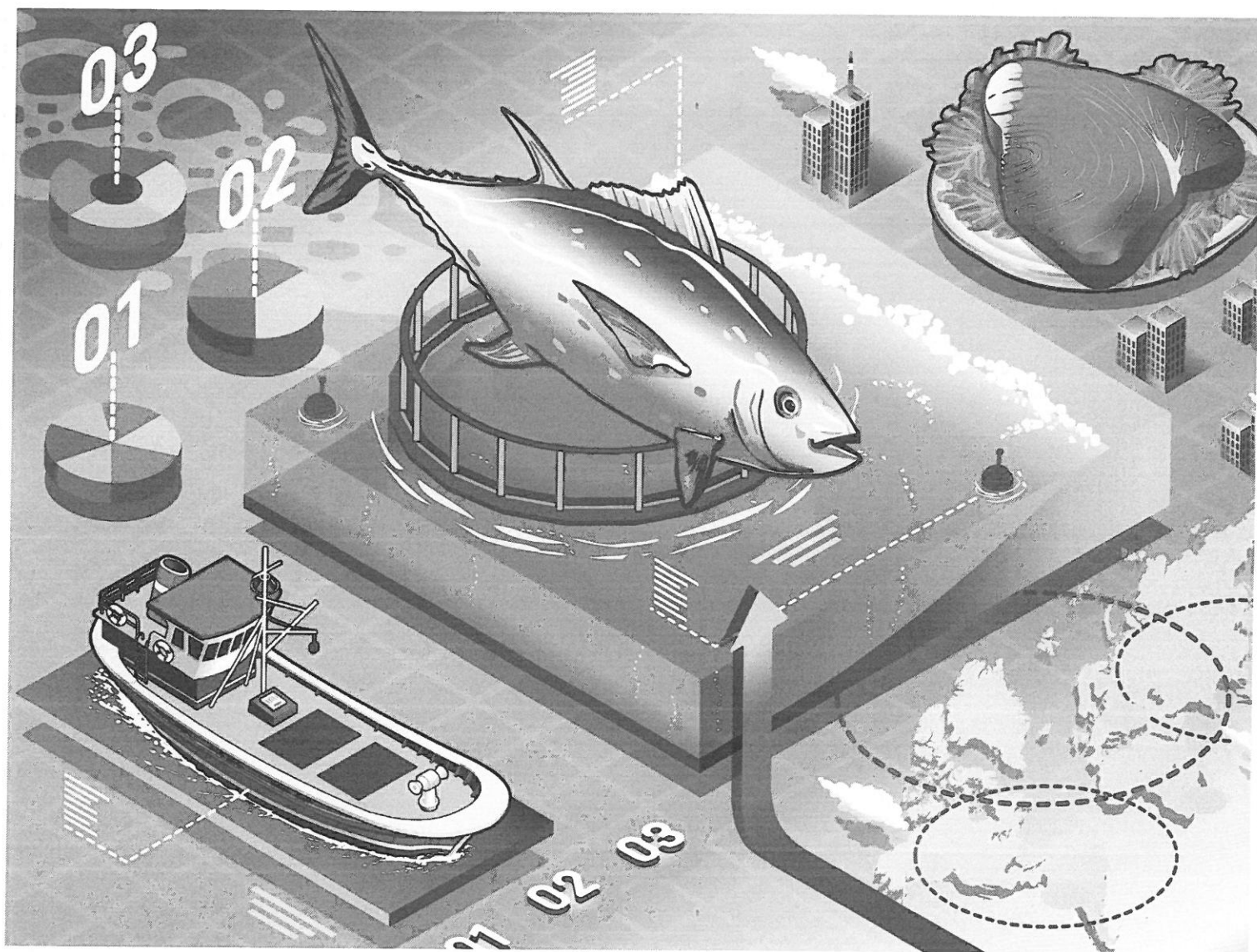
Tanolapia

- Fisheries support services such as consulting, training and capacity building;
- The existing Tanzania per capita fish production is a very low 7.2 kgs. A huge demand is available even if the capita supply increased to the global average Supply of 19.8 kgs;
- Aquaculture is the sole tool capable of increasing the country's total fish production, if properly managed and is currently being promoted by the Government.
- Use of *Oreochromis niloticus* seed stock from **quality sources** will enable a competitive growth cycle for cultured fish.
- Tilapia is a sort-after species and well known to the local market.
- Tilapia is a euryhaline fish that can grow in brackish/ salt water successfully.
- International quality fish feed available in Zambia.

6.4 Threats

- Illegal fishing and trade practices;
- Inadequate distribution logistics;
- Significant post-harvest losses and high wastage;
- The entry barriers are fairly low and hence new competition can quickly establish itself on similar lines and structure;
- Potential political and social instability;
- Cheaper priced imports; particularly from China;
- The competitors may poach trained staff members.

AQUACULTURE VALUE CHAIN

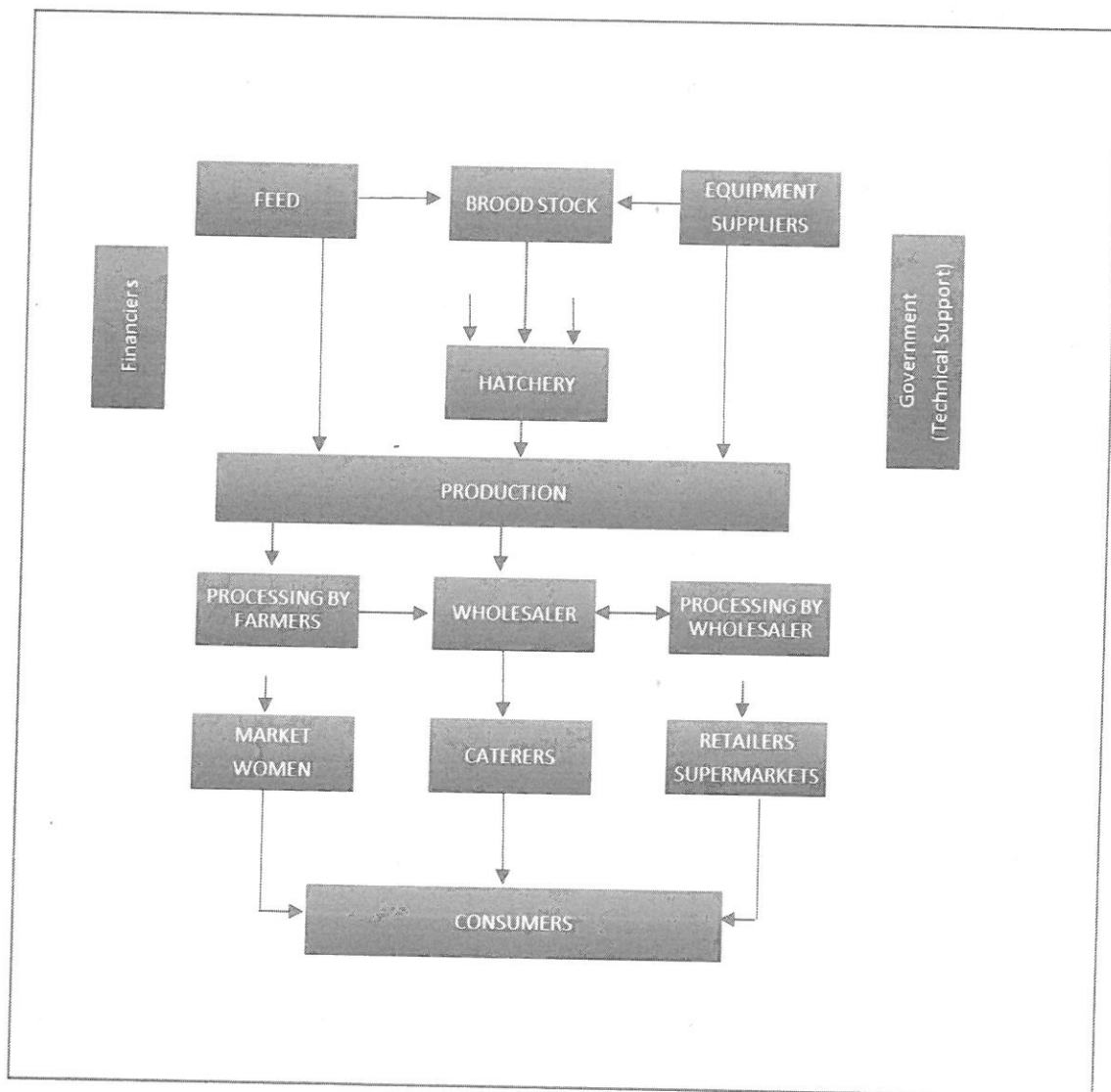


7. AQUACULTURE VALUE CHAIN

7.1 The Value Chain Map

The value chain map is a visual depiction of the various functions involved in the production of fish to the consumption by the end markets, and the various actors who deliver those functions and linkages between those enterprises.

Figure 7.1 Value Chain Map.





7.2 Input

Feed

The major input for farmed fish is feeds, medicines etc. Feed typically accounts for over 70% of the total cost of production.

There are basically 3 types of feed available to fish farmers in Tanzania;

i) Imported feeds. These are extruded floating feeds high in protein and fat and is the most expensive. The imported feed is said to have the best Feed Conversion Ratio (FCR);

ii) Locally manufactured feeds. These are produced from locally available ingredients; however, the fish meal is usually imported;

iii) Homemade feeds that are produced by individual farmers themselves.

Brood stock

Brood stock are used for the production of fry. Proper brood stock management is necessary to ensure that no in-breeding occurs.

Equipment and Machinery

This includes hatchery equipment, building materials, nets, cages, cooling equipment, boats and barges and distribution trucks etc.

7.3 Hatcheries

Because of the rise in aquaculture across the country, the demand for fingerlings has also grown rapidly. As a result, many standalone hatcheries have been

established.

Standalone hatcheries of small and medium scale hatcheries have been established and dominate the market.

7.4 Production (Grow-Out Fish Farmers)

There are basically three categories of fish farmers:

Figure 6.2 Aquaculture Farms Sizes.

Scale	MT/ Month	Method
Small	0-5.0	Pond/ Tanks
Medium	5.0-10.0	Tanks/ RAS
Large	+ 10.0	RAS/ Cages/

It should be noted that up to 80% of all aquaculture is produced by small scale operations.

7.5 Processing

Processing is largely restricted to salting and smoking. Because it is not particularly complex, producers are increasingly forward integrating into smoking, thereby enabling them to trade in both fresh and processed fish.

7.6 Distribution Channels

Wholesalers

These are traders who buy fish at farm gate in large quantities and resell to



retailers such as market women, retail outlets (restaurants, fast food outlets and retail shops). These wholesalers also process fish by smoking it and then retailing it as with fresh fish.

Market Women

The market women play a very important role in the entire value chain. They buy from the wholesalers and sell at the local markets. They are central in ensuring that fresh fish are transported to the markets where the consumers and caterers can buy from them.

Caterers

Apart from the market women, caterers are the other major retail outlets. These include, restaurants, Bars etc. These caterers buy fish in either its fresh form or smoked.

7.7 Aquaculture Business Models

On both the input supply and processing segments of the value chain, there are signs of backward and forward integration, rather than building vertical linkages with third party feed suppliers and processors. This is being driven by the desire to manage quality, but also to save costs and capture additional income streams.

Currently, two major business models are emerging, the first is the fully integrated firm that manufactures its own feed, farms, processes and distributes fish. The other is the cluster-based, aquaculture park model that is based on specialization and strong inter-firm ties.

TECHNICAL FEASIBILITY STUDY

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8. TECHNICAL FEASIBILITY STUDY

8.1 Background

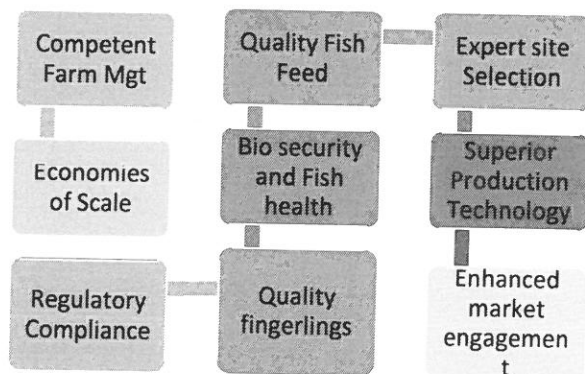
The technical feasibility study was concerned with the viability of the aquaculture at the company's Bagamoyo site in Tanzania. The key technical issues raised are summarized in this Chapter.

8.2 Competent Farm Management

There are very few qualified people in aquaculture both in terms of relevant education and experience. There are also very few institutions that train on aquaculture as well as hands on training in hatchery management, fish feed production as well as quality assurance. It is proposed to commence operations with appropriately qualified and experienced expatriates' senior management staff. The expatriates will in turn be expected to train nationals to take over within a two, three-year period.

8.3 Appropriate Economies of Scale

The smaller sized farms of less than 1,000 MT/annum are not entirely considered to be commercially viable. The feasibility study proposes the establishment of commercial scale farm operations.



8.4 Regulatory Compliance

The study has emphasized the importance of Regulatory Compliance with all Tanzania's legislations and also internationally recommended best practices by institutions such as the FAO.

The study also emphasizes the importance of maintaining the prescribed



data on water qualities, feed quality monitoring, environmental protection etc.

8.5 High Quality Fish Feed

The success of any aquaculture fish operation is highly depended on quality fish feed. Currently, Tanzania has no major fish feed factories that offer international quality feed. The study recommends the initial importation of quality fish feed.

If proven economically viable, manufacturing plants, each with a capacity of 6,000 MT per annum maybe established in future.

8.6 Enhanced Bio-Security and Fish Health.

Bio-security is a point that needs to be mentioned as utilizing a river as a water input source leaves the farm is open to contamination from any developments further upstream, now and in the future. We are already aware of one fish farm upstream and many more could be developed increasing the possibility of disease transmission to the project. Negating this possibility can be achieved by filtering the water prior to pumping to the ponds. Since several of the listed diseases of aquatic animals as well as a number of other important diseases, can be introduced into farms with source water when it contains vectors or carriers (i.e. wild infected crab or shrimp larvae, wild fish, etc.), some farms operate biosecurity plans that include provisions

for the disinfection of source water.

To ensure the highest possible fish quality, proper bio security measures have been recommended. Furthermore, all staff will be properly trained on fish health and related bio security measures. It is also proposed that detailed operating instructions will be prepared. The Feasibility study covers; disease prevention techniques; diseases control measures; eradication of disease; establishment of fish health plans and its monitoring.

Proper equipment and water cameras will be acquired and detailed records of all key water quality indicators will be maintained.

8.7 Quality Biological Materials (Fingerlings)

The study recommends the following species:

i) NMT Tilapia;

This specie have been recommended for aquaculture because of their ability to tolerate crowding, disease resistance and adaption to a wide range of diets.



8.8 Expert Site Selection and High-Quality Water.

The Bagamoyo site was observed to have sufficient infrastructure available reasonably close. These include access to an all-weather road, fresh water supply from the nearby Ruvu River.

Global Warming

The proposed site is nearby the Indian Ocean and as a result global warming may result in the flooding of low-lying areas, destruction of coastal infrastructure, salt water intrusion into soils and underground water systems and the erosion of the coastline. In the near to medium term future; such impact is only expected to increase.

Proposed Bagamoyo Port.

Tanzania has commissioned a USD 11.0 billion Bagamoyo Port that is being funded by the Chinese and Omani Governments. The new port is expected to handle 20.0 million containers /annum (as compared to the current largest and busiest Dar Es Salaam Port currently 500,000 containers/ annum). The construction of this new port has not yet begun but the construction of such large infrastructure will probably come with potential challenges; the dredging of the channel and construction would possibly increase water turbidity, thereby affecting cage marine fisheries operations, the ship traffic will also bring challenges of pollution and navigational dangers etc.

Therefore, an alternate/ additional location is prudent to secure further North along the coastline to ensure no disruption from these activities. A likely spot is some 6 km N and 7.23 km from shore. The depth is likely to be similar as assessed, as this is a shallow continental shelf and further North at Saadani the depth is also 20 m at 7 km distance from shore. This will site the cages some 13 km from the possible port development site as compared to 7 km.

8.9 Superior production technology

The Study explored the various fishing technologies that could be viably applied at the Bagamoyo site. It recommends the establishment of: -

Project 1- NMT Tilapia

- i) a state-of-the-art NMT Tilapia hatchery with an annual production capacity of 10.0 million fry;
- ii) In Pond raceways (IPRS) as these will be the most ideal and most robust format at the site. The equipment would be sourced from different suppliers with the advise of Dr. Jesse Chapman, developer of the system and Professor at Auburn University
- iii) Processing Facilities with cold rooms, refrigeration and ice production unit;
- iv) an administration block; and
- v) storage facilities for fish feed etc.

Other Initiatives- Social Inclusion Programme- Crab



Tanlapia

The neighboring community is made of small villages many of which are fisheries dependent. The artisanal fishermen and current practices were observed as not sustainable due to over fishing. However, the Feasibility Study has recommended that the Social Inclusion Programme be located at these villages. **The villagers and in particular women will be encouraged to participate in Crab farming.** Tanlapia will provide the fingerlings, feed inputs and technical support. Tanlapia will also provide 100% buy back option.

Further details of this initiative will be found in the separate business plan document.

8.10 Enhanced market engagement

The initial target market would be the urban domestic markets. This market is significant such that the currently most fish could be sold fresh or gutted at farm gate.

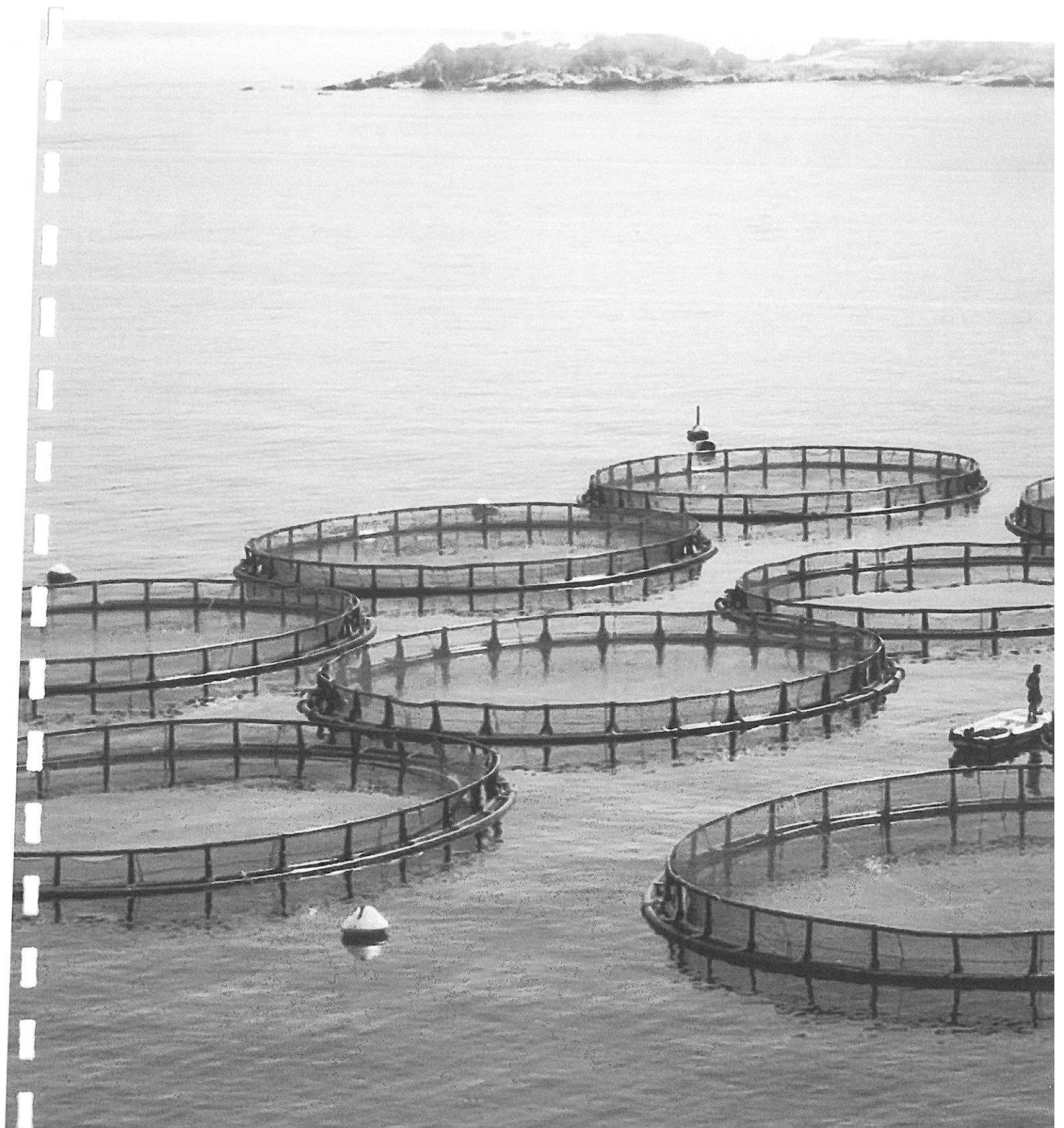
The regional export market will be further explored and in particular strong demand has been noted from Democratic Republic of Congo (DRC).

8.11 Security Measures

The Study fully describes the various security measures that will include CCTV cameras (including water-based ones), infra-red motion detectors, control rooms supported by physical presence of security personnel.

8.12 Conclusion

It should be noted that this report provides the **technical viability** of the recommended species. This Business Plan goes the next steps to confirm financial viability of each of these species.



**ENVIRONMENT and SOCIAL
IMPACT ASSESSMENT (ESIA)**

9. ENVIRONMENT and SOCIAL IMPACT ASSESSMENT (ESIA)

9.1 Background

To comply with current Legislation requirements, the following environmental related studies have been undertaken: -

9.2 TAFIRI Survey Report- Key Issues.

TAFIRI has undertaken its technical survey of the proposed fish farm sites together with the proposed fish species. They have issued a positive report to the Director of Aquaculture.

The parameters studied included bathymetry, fishery, physical and chemical environment as well as socio economics implications of proposed site for cage culture.

9.3 ESIA Report - Key Challenges.

The ESIA assignment is currently being undertaken but is expected to address the following key challenges: -

Farmed Fish Escapees.

Challenges associated with farmed fish escapees such as impact on wild stocks through competition, interbreeding, as well as the spreading of parasites.

Pollution.

This constitutes the discharge of particulate and dissolved nutrients through uneaten waste feed, fecal matter and other excretory products.

Processing Plant Waste

The proper management of harmful substances such as nitrogenous wastes from the effluent.

Potential Disruption to Existing Activities of Artisanal Fishers

The potential disruption to existing artisanal fishers and other farming activities in the neighborhood was fully investigated and appropriate mitigation measures recommended, this included the support in the establishment small scale out growers.

Full details are available in the TAFIRI report available from the Project Promoters.

9.4 Environmental Management Plan (EMP).

In response to the TAFIRI Report, an Environmental Management Plan (EMP) will be prepared. The EMP can be defined as "an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are

prevented and that the positive benefits of the projects are enhanced”.

The EMP is therefore an important tool for ensuring that the management’s actions arising from the recommendations of the TAFIRI Report are clearly defined and implemented through all phases of the project life cycle.

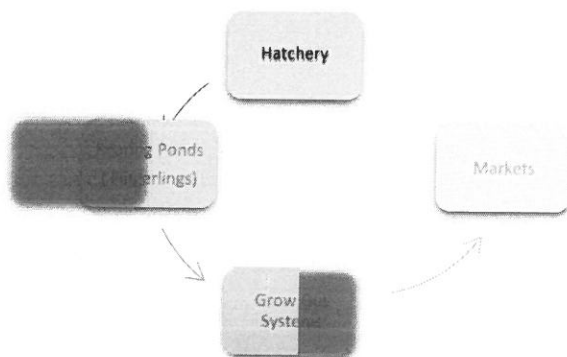
PROJECT DESCRIPTION

10. PROJECT DESCRIPTION

10.1 Aquaculture Fish Production Cycle.

The entire aquaculture fish production cycle is summarized in the Figure 9.1 below.

Figure 10.1 Aquaculture Fish Production Cycle



iii) processing facilities including; cold rooms, refrigeration and ice production unit;

iv) an administration block; and

v) storage facilities for fish feed etc.

Phase 2

i) Increase production by an additional 3,000 MT to reach production of 4,000 MT per annum in Year 2 by providing additional: -

ii) Nursery facilities;

iii) Hatchery infrastructure

ii) In Pond Raceways infrastructure.

10.2 Project 1 - *O. niloticus* Tilapia.

Phase 1

- i) a state-of-the-art GIFT Tilapia hatchery with an annual production capacity of 11.0 million fry;
- ii) Floating raceways with capacity of 1,500 MT per annum.

Investments made will include:

- ii) Nursery facilities;
- iii) Hatchery infrastructure;
- ii) In Pond Raceways infrastructure.



Tanlapia

10.3 Energy Sources.

The main source of energy will be from the national grid that is considered to be fairly reliable. However, as power is needed 24/7, backup generators will also be purchased.

10.4 Processing Plants

Initial market surveys indicate that current processing only includes gutting and blast freezing the fish. No filleting is

currently being considered as one would need to grow fish to a minimum of 700 grams.

10.5 Proposed Business Model.

The proposed business model is a hybrid of the vertical integration and the cluster-based Park Model. The Company will operate in all the upstream activities of hatchery, production but for downstream activities it will dove-tail into the existing distribution system.



MARKETING STRATEGY

11. MARKETING STRATEGY

11.1 Introduction.

A detailed marketing strategy plan has been prepared and its key recommendations are summarized below: -

11.2 Target Market.

From the earlier Chapters, it was noted that Tanzania's per capita supply of fish was only 7.2 kgs. It is clear that the low supply is a result of low fish supply that has in turn pushed up fish prices. Increased supply levels coupled with an efficient distribution network, will result in lower prices and hence generally fish consumption should be expected to increase significantly. The key target markets are: -

Domestic market.

The target area where we will sell our product is part of the North-Eastern and Central regions of Tanzania. The main cities of this area are:

City	Population
Bagamoyo District	400,000
Dar Es Salaam	6,000,000
Morogoro	400,000
Dodoma	450,000

Babati	100,000
Arusha	450,000
Moshi	210,000
Korogwe	75,000
Tanga	300,000
Kibaha	140,000
TOTALS	8,525,000

There are many other small towns within this circuit that we will explore as potential markets in the future. These towns are far enough away from Lake Victoria sources of Tilapia to give the project a competitive advantage. Expected demand from this market would be 59,675 MT per annum

Regional Market.

There is a significant demand for high quality fish products from the neighboring countries of Rwanda, Burundi and in particular the Democratic Republic of Congo (DRC).

International Market.

In the future, the export market may be considered. Currently, Tanzania is a net exporter of fish products with the Nile Perch being the main product with the EU being the principle market.



11.3 Product

The fish products have been described in detail including its high quality arising from the use of the latest farm fishing technologies. The health benefits of eating sufficient fish will also be emphasized. This strategy determined the finer demand of the fish in its different forms; namely fresh, gutted, frozen or processed. The most desirable sizes (weights) will be determined and finally, an easy to say and memorable product name will be established.

11.4 Pricing

The actual pricing of the fish will substantially be determined by market forces. However, the different demand of the different state of fish coupled with preferred fish weights mix would assist in the determination of the most profitable options.

Recent market survey indicated the following retail prices:

=Tilapia USD 2.50 to 3.50;

11.5 Place

The company will establish relationships with local people in each of those towns to be distributors. We will provide all the support and product that they will need, and the fish will be delivered by our own

truck fleet and using the actual train transport system if it's available.

In the event that exports are considered viable, airplanes will be used for fresh fish products for regional and international markets.

11.6 Promotion

Promotion is a very important component of marketing as it boosts brand recognition and sales. Promotion comprise, sales organisation, advertisement, sales promotion and public relations. Advertisements typically covers paid for communication methods such as television and radio commercials, print media and social media. Public relations on the other hand are communication methods that are not paid for and would include press releases, exhibitions, seminars, conferences etc.

Tanlapia Limited will use the following varieties of promotional strategies as follows:

Media: Domestic and regional traditional media like TV, radio and newspapers;

Publicity events and sponsorship to create awareness and interest social media pages such as Facebook and Instagram. This will serve as a two-way communication platform for the customers to be able to engage both the organization and partners by sharing locations that they can access fish;

Training fish farmers and fish traders on fish handling techniques. Provision of stalls (Tables and umbrellas) for select traders to be able to run the business and open up each market a place to fry fish.



COMPETITION

12. COMPETITION

12.1 Domestic market

Originally, the company's target will primarily be the domestic Tanzania market and in particular the major urban centers. The key competitors are artisanal fishermen and very small farms (5 - 10 MT per year). Currently there are no big commercial scale fish farms in Tanzania.

Whilst direct competition may appear to be limited, there are the challenges of dealing with power buyers. This relates to the potential impact of big wholesalers who may play the big producers against each other. This matter has been further discussed under the Marketing Strategy chapter.

12.3 Chinese Imports

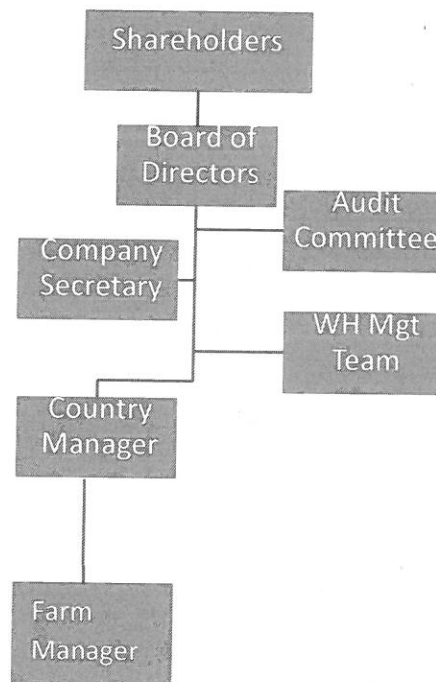
Africa has recently seen increases in Chinese fish imports. However, this is reported to be a highly inferior product (largely low-grade frozen fillets). Many countries, including Tanzania, have banned the importation of Chinese fish products. However, in a recent development in Kenya it was noted that the Chinese have starting to apply political pressures to allow importation of fish products. Prior to its banning in Tanzania, Chinese products were noted as low as USD 2.50 per kg.

13. GOVERNANCE and MANAGEMENT ORGANIZATIONAL STRUCTURES

13.1 Proposed Governance Structure

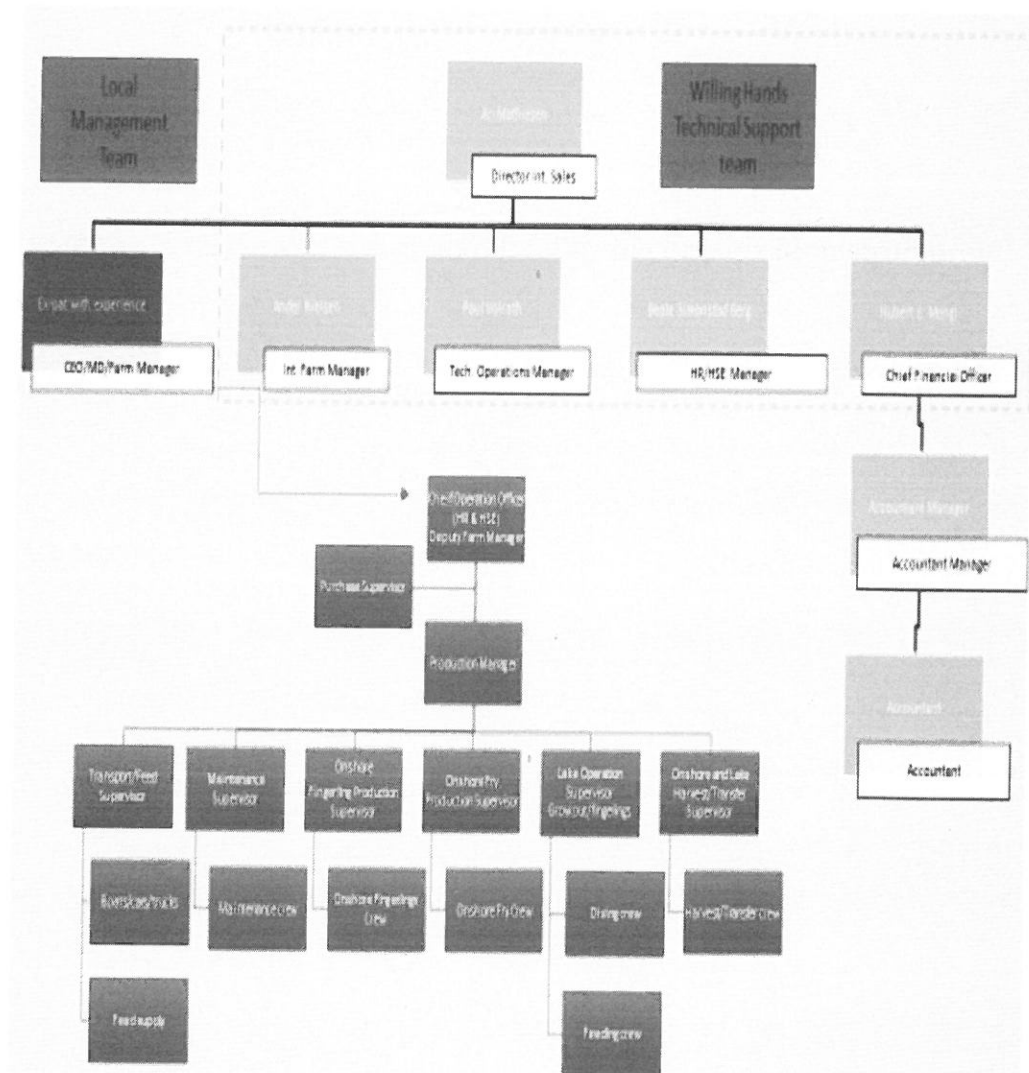
The proposed governance structure is shown in the Figure 13.1 below. For good governance practices, the independent Board of Directors key responsibility will be strategy related and will not be involved in the day to day running of the business. The day to day management of the business will be left to the management team.

Figure 14.1 Governance structure



Proposed Farm Organizational Structure

The proposed team for each Farm is shown in the following organization structure.





Tanlapia

General Manager (GM)

The GM will be a holder of a University degree and will provide the overall leadership and strategic directioning of the business. As previously mentioned, this is new venture and therefore the holder of this position will be someone with experience in the aquaculture industry.

Farm Manager (FM)

The day to day operations of the farm will be managed by the FM. This person will be a holder of a relevant University degree and will be responsible for ensuring the smooth running of the entire fish farm operation etc. Their responsibility will also include; ensuring that the feed, water qualities are maintained at optimum levels; the assessment and monitoring of risks; and that production losses are kept to the barest minimum. The right candidate will be a marine biologist and experienced in commercial fish farming operations.

Chief Finance Officer (CFO)

The CFO will be charged with the overall responsibility of the finance and administration function. The candidate

will be expected to have excellent budgeting skills together with extensive product costing experience. The candidate will also be required to have a minimum of ten years' experience in a busy business enterprise and be a holder of a University or professional degree.

Chief Technical Officer (CTO)

The CTO will be charged with the identification of the most efficient and effective technological solution for the entire project. This would include the identification of the right suppliers for each technical solution recommended.

Operations Manager (OM)

The OM will be primarily tasked with the running of the Hatchery and related Processing Factory operations. This person should also be a holder of a relevant University degree with minimum 5 years relevant experience.

13.3 Staff Complement

At full capacity, the entire operation will directly employ some 64 staff members. Indirect labor is estimated at 700.

SOCIAL INCLUSION PROGRAM

14. SOCIAL INCLUSION PROGRAM.

14.1 Engaging the Local Community.

The company will establish a crab hatchery and fattening facilities in the future. The guts from the fish will be utilized as a fresh protein source. Community members will be encouraged to establish small crab fattening systems so as to directly participate in the GFP production activities as the catch rates continue to decline. The juvenile and feed can be sourced from the company. Participants will be offered a choice of selling back to the company or may sell to any other third parties. A hands-on dissemination of the technology/farming techniques will be very important aspect of this collaboration. The smallholder fish farmer will benefit from access to market, feed, seed and capital.

This CSR will only be feasible to start after we have been able to establish the Commercial fish farm, so this program

needs to start during second year or after the establishment of 1,500 MT Tilapia production. It should be organised in a way that it is not our competitor and they should be treated as partners to complement our mainstream business. One benefit is that the main project gets a good standing with the general public and that the people involved can make a sustainable living from their activities in close partnership with the main project - our commercial fish farm. This proposed program will only be viable if we partner with an NGO that can offer the participants "micro-loans" that allows them to buy the equipment, juveniles, feed etc from us in order to reach their harvest.

Alternatively, there is also the option of focusing on the 'crab ladies' program that involves the selling and distribution of seafood that aligns very well with our own needs as a commercial fish farm.



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RISKS ASSESSMENT

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15. RISKS ASSESSMENT

16.1 Introduction.

All businesses face various risks and the management of these risks is important for their success. The following risks have been identified as important and therefore will require close monitoring. The various mitigation measures that will be put in place have also been expounded upon below.

Figure 15.1- Risks Matrix

		4	5
	3	1	2
		6	7
11	10		
	9		

	Impact	Likelihood
High	Significant Over 20-30% impact on Capex and Opex or IRR < 15%. Impact to the environment as a result of diseases can affect the business significantly (6 months operational downtime)	Likely Likely occurrence, has occurred in the past or there is high degree of uncertainty.
Medium	Moderate Over 10-15% impact on Capex and Opex or IRR < 20%. Impact to the environment as a result of diseases can affect the business (3 months operational downtime).	Possible Possible occurrence within a year.
Low	Insignificant Over 5-10% impact on Capex and Opex or IRR < 25%. Impact to the environment as a result of diseases can affect the business (1-month operational downtime).	Unlikely Unlikely to occur this year, has never occurred.

Risk Type	Description	Impact	Likelihood	Mitigants
1 Construction Risk	Inability to commence and complete project on schedule, within budget and at requisite quality.	Moderate	Possible	Technical staff has relevant experience. Furthermore, a Built and Operate approach will be used to implement this new project.
2 Technical Risk	Exposure to loss arising from activities such as design and engineering, manufacturing, technological processes.	Moderate	Possible	The Project has appointed well qualified and experienced team to provide the appropriate technical solutions.
3 Market risk	<p>Insufficient demand for the product arising from:</p> <ul style="list-style-type: none"> -Oversupply from other fish farms at sea and inland fisheries; -Poor quality of fish compared with other sources as a result of the operating environment not being ideal for producing quality tasting fish; -Inadequate logistics supply chain to distribute and reach the market place bearing in mind that fish is perishable with a short shelf life. -Cheap Chinese Imports 	Moderate	Possible	<p>Project studies are very positive on market risk as the product is under supplied. Price fluctuation will be managed by keeping the production cost down and where suitable long-term contracts will be made with consuming regular clients. Competition will take years to catch up and unlikely to saturate the market in East Africa.</p> <p>The major trend on animal protein continues to grow with population growth, especially in Africa and in East Africa.</p> <p>Elsewhere in Africa fish farming has proven very successful.</p> <p>Increase in population will create increase in urbanization and expansion of the fish market close to production centres. Fish production will have advantage over other animal protein because it uses a fraction of water bodies spaces at sea and lakes. Land based animal proteins will be competing with humans in urban environment.</p> <p>The fish farm in Tanzania will be close to its market of Dar Es Salaam (a City of over 6 million people).</p> <p>The Tanzania Government has banned the importation of Chinese fish products as they contained dangerous levels of toxic materials such as mercury.</p>

Risk Type	Description	Impact	Likelihood	Mitiga
4 Production Risk	<p>Risk of diseases in the production process; -Increase in cost of fish feed: Production cost increases are very dependent on fish feed (>70% of Opex); -Risk of theft and/or damage to the fish stock, hatchery and cages from vandals or weather conditions or maritime predators; -Feed mismanagement: adversely impacting the rate of growth and even killing the fish.</p>	Significant	Possible	To mitigate risks associated with disease it requires strict adherence to a fish health programme using best genetic material (frys/fingerlings and fish feed stock). This will require experienced management, trained staff, systems and procedures to be followed <u>always</u> .
5 Infrastructure Risk	<p>Unreliable Power and water utilities supplies: -Risk of unreliable and insufficient power and fresh water needed to carry out operations; -Roads network: Inadequate road access and logistics supply chain difficulties to enable delivery of the product to the market place.</p>	Significant	Possible	<p>Every effort will be made to ensure 24 hours operations especially with the Hatchery; External infrastructures will have challenges. This will include having alternative and backup sources of power. The same will apply to all services that are important to the business and the</p>
6 Legal and Compliance	<p>Inability of the business to comply with stringent health, safety and maritime regulations; Risk of adversely impacting the environment e.g. from excessive use of fish feed; Tanzania risk of doing business - bottom quartile;</p>	Moderate	Possible	<p>The business operation will operate in a sensitive environment where disease related issues are of concerns and measures to mitigate will need to be developed. Technical audit will insure sustainability of the business with its environment. Care and attention will need to be exercised by experienced hands (that includes research), trained staff, systems and procedures with independent reviews and appraisals.</p>

Risk Type	Description	Impact	Likelihood	Mitigants
7	Devaluation of the TZS against convertible foreign currencies bearing in mind the debt financing will be in a foreign currency.	Moderate	Possible	Adequate forex hedging procedures will need to be instituted. Export sales could be denominated in a foreign currency to try to match forex costs (In the future).
8	Unavailability of suitably skilled and experienced workforce; Dependence on expatriate management at least initially and their willingness to be hands on and in situ in Tanzania; Inability to transfer technical and marketing skills satisfactorily to national employees.	Insignificant	Unlikely	The company will have its own HR capacity. Management will be sourced from Norway for at least three years. National staff will be recruited and trained before operations commence. Staff will be employed in line with labour laws in Tanzania. Delegated responsibilities and job descriptions will be given to management and all capable staff (trained and certified). Staff back up procedures will be put in place to cover work cycles and leave
9	Risk of increase of interest rate over the duration of the loan	Insignificant	Unlikely	Presently global interest rates are low. Efforts will be made to get fixed interest rate facilities.
10	This is the risk that counterparties may default on their contractual obligation resulting in financial loss to the company.	Insignificant	Unlikely	Most sales are expected to be on cash basis. However, the credit worthiness of all counterparties will be assessed including the setting of a credit limits.
11	The risk that the company may not be able to meet its financial obligations as they fall due.	Insignificant	Unlikely	Management will maintain rolling over cash flow projections.

FINANCING AND INVESTMENT PLANS

16. CONSOLIDATED FINANCING, INVESTMENT PLANS AND FINANCIAL OUTCOMES.

Description	Totals	%
Equity- Non-Cash (Land etc)	2,500,000	
Equity – Cash	835,000	
Total Equity	3,335,000	30%
Total Debt	1,765,000	70%
Total Funds	5,100,000.00	100%

16.1 Consolidated Financing Plan.

The total project is estimated to cost USD 5,100,000. and will be financed by both debt and equity.

16.2 Consolidated Investment Plan. The capital expenditure funds raised will be applied towards the following activities/ assets.

Working Capital Budget

The operations of a fish farm require a significant working capital budget as operating costs are incurred for 6 to 8

months before any revenue income streams start to flow. As a result, the working capital finance is estimated a USD 500,000

16.3 Tanzania Investment Certificate.

The Project will seek Tanzania Investment Certificate. This certificate

6.4 Forex Regulations

Currently there are no forex regulations and company can remit to international investors dividends and also remit instalments need to service foreign debts.

17. PROJECT 1 -TILAPIA FINANCING, INVESTMENT PLANS AND FINANCIAL OUTCOMES

17.1 Financing Plan.

The Project 1 cost is estimated at USD 5,100,000 and will be financed by both debt and equity as described in Figure 18.1 below.

Figure 17.1 – Capital Structure

Description	Totals	%
Equity- Non-Cash (Land etc)	2500000	
Equity – Cash	835000	
Total Equity	3335000	65%
Total Debt	1765000	35%
Total Funds	5,100,000	100%

17.2 Investment Plan

Description	USD
Raceways/Outgrow Cages	295,000
Nursery	75,000
Hatchery	80,000
Other Infrastructural Items	1,200,000
Equipment, Vehivles,	450,000
Land contributions	2,500,000
TOTAL	4,600,000

17.3 Working Capital Budget

The operations of a fish farm require a significant working capital budget as operating costs are incurred for 6 to 8 months before any revenue income

streams start to flow. As a result, the working capital finance is estimated a USD 500,000.

17.4 Financial Projections Basic Assumptions

The key assumptions data used in the preparation of these projections are as follows: -

Financial Projections Key Assumptions.



Description	Range
Equity Amount - USD	
Debt - USD	3,335,000
Taxation	1,765,000
Dividend Policy	30%
Inflation Rate- per annum	50%
Depreciation	1-2%
	5-40 years' straight-line basis
Hatchery Annual production of fry (Number/annum)	10,000,000
Fish Feed costs per kilogram - USD	0.8 to 1.0
Hatcheries operations costs - %	5.0%- 5.7%
Optimum fish harvest weight in grams	350
Food Conversion Ratio (FCR)	1.4
Diesel Price/ litre (USD)	1.00
Vehicles - Annual repairs & Maintenance Costs -%	10.0%-11.6%
Electricity Prices- KWh (USD)	0.15
Farm Gate Prices per kgs (USD)	
Whole Fresh Fish on Ice	2.95- 4.08

17.5 Sensitivity Analysis

The financial success of fish farming operations is essentially reflected in the Feed Conversion Ratio (FCR). Fish feed pricing and also Selling prices are important determinants of financial outcomes.

The Base Case Scenario assumes a prudent FCR of 1.35 and fish feed costs of USD 0.80/kg. Figures 18.7 to 18.9 provides the different sensitivity analysis of these three important factors.

Figure 18.7- Impact of feed on IRR.

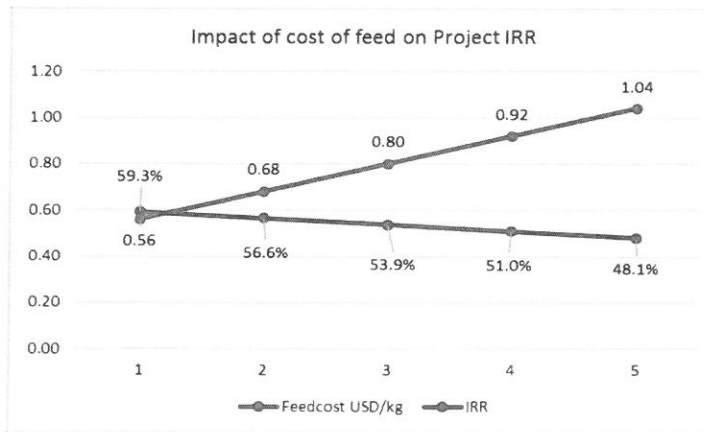


Figure 18.8- Impact of FCR on IRR.

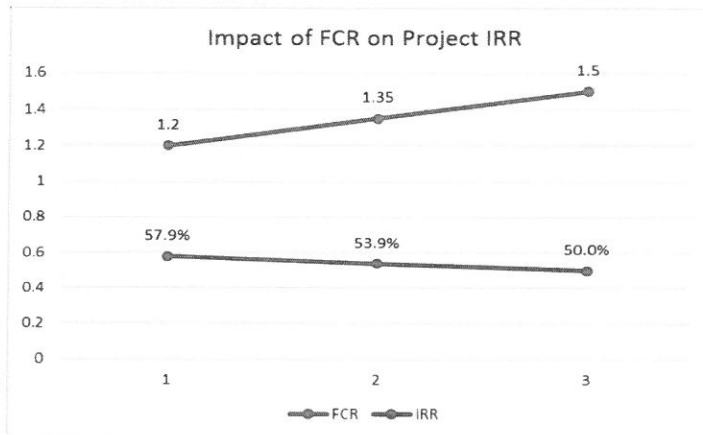
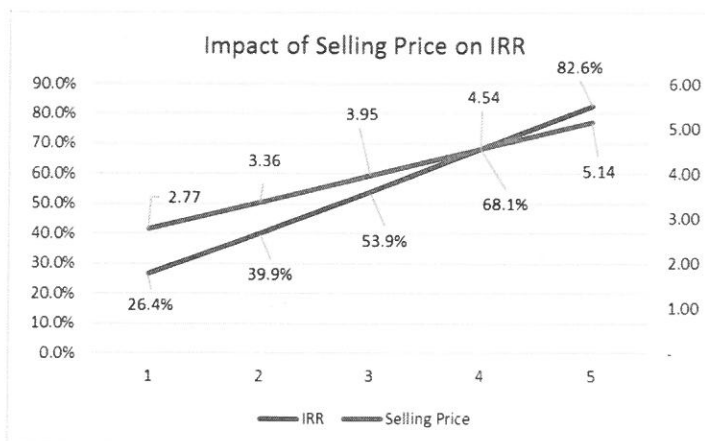


Figure 18.9- Impact of Selling Price on IRR.





ECONOMIC and SOCIAL OUTCOMES



19. RECOMMENDATION

On the basis of the significant fisheries products supply deficit, healthy projected financial returns coupled with many positive social economic contributions, it is recommended that this project be implemented.