The economic outlook of the fisheries sector economics essay

Economics

INTRODUCTION

1. 1 Background information

Mauritius is a maritime state with an Exclusive Economic Zone (EEZ) of about 2. 3 million km2. In line with its policy of economic diversification, the government of Mauritius has recently reoriented its approach to tap its marine resources more effectively with the aim of making the country an oceanic state. The Mauritian Economy is based on exportation of Sugar, Textile, Tourism and Fisheries. The Fisheries sector contributes about 1. 3% of the GDP through export earnings and employment creation. 90% of our fish and fish products exported constitute of tuna (Statistics Mauritius, 2010). The sugar industry and the textile industry which have been the backbone of the Mauritian economy for decades have now contracted significantly. Given the country’s large EEZ, it has the potential to develop its tuna industry into a strong sector. It could help the economy to resist any future possible instability which could arise from the Sugar, Textile and Tourist sectors.

1. 2 HISTORY OF TUNA

Tuna fisheries are among the oldest in the world with Phoenician trap fisheries for bluefin tuna occurring around 2000 BC (Ravier and Fromentin 2001). They are the largest and commercially the most important of all fisheries (Collette and Nauen, 1983) and are one of the major products in seafood international trade which accounts for about 9% of export value. They are in growing demand throughout the world market on account of their excellent meat quality (Chang and Lin; FAO, 1997). Schorr (2004) noted that about a billion people in the world depend on fish for their livelihood.

Developing countries are the major supplier of fish to developed countries. Developed countries rely a lot on imports for seafood products as their local fishery productions are inadequate to keep up with the rising demand. One third of production is exported as fresh, chilled or frozen fish (Paquotte, 2003). The European Union (EU), USA and Japan markets alone accounted for more than half of the total import value. The main final market for tuna in general is the USA, Japan and the EU (Paquotte, 2003). But, the market for canned tuna is in Europe and the main exporting countries are Thailand, Philippines, Ivory Coast and Spain (Paquotte, 2003). The species of tuna marketed are albacore, bigeye tuna, atlantic bluefin tuna, pacific bluefin tuna, southern bluefin tuna, yellowfin tuna and skipjack tuna (FAO, 2012). The tuna industry contributes significantly to the economy of various countries including Mauritius. Seafood products represent the leading export commodity for Mauritius with tuna being the most dominant. Mauritius has consistently being ranked among the leading exporters of canned tuna to the EU. The government has taken advantage of the thriving world market for tuna in the bid to raise employment, increase standard of living and contribute to economic growth through revenues from export. About 60% of fish consumed in the EU are from outside EU waters to meet the demands of its market both in terms of canned tuna and tuna loins. In addition, it contributes towards investment and employment. This has been possible due to the fisheries relations between the EU and third countries, notably the African, Caribbean and Pacific (ACP) countries signatory to the Cotonou Agreement (Lomé Convention). Two types of fisheries access agreements have been signed between the EU and ACP countries, the tuna agreement

for tuna and tuna like species and the mixed agreement. Thus, ACP countries benefit from preferential market access compared to others and are not affected by tariff barriers. This means that ACP countries have unrestricted duty-free access to the EU market for their exports.

1. 3 Economic outlook of the Fisheries Sector

Increased competition worldwide coupled with the erosion of preferential trade agreements and exacerbating rise in oil prices have encouraged the diversification of the economy by promoting sectors and activities liable to contribute to growth. The marine sector offers high potential to contribute significantly in the economic development of the country by boosting economic growth and creating more jobs. Fish being an important source of protein in the population’s diet, had a per capita consumption of 21. 7 kg in 2010 (Statistics Mauritius, 2010). The fisheries sector represents a major sector for Mauritius economically, socially and nutritionally. Although local production is not enough to cover market needs, it provides direct employment to around 12, 000 persons including those involved in fishing, canning, other related activities, distribution and marketing. The canneries and processing plants are also key sector employers. The fisheries and seafood sector contribute about Rs 16 billion to the national economy whilst the local fish production sector is valued at about Rs 1 billion. The total supply of fish and fish products for direct consumption is about 18, 000 tons, whereas 92, 000 tons of processed fish and fish products produced mainly from imported raw materials are exported. (Ministry of Fisheries Annual Report, 2010)From a trade and support services viewpoint, it is also important for its links with the Rs 40 billion per annum tourist industry of

Mauritius. Total local production is small at about 9, 000t per annum. Mauritian fish processing and export sector dominates seafood activities. These activities are concentrated in the seafood hub in Port Louis and in 2009 the businesses that comprise the seafood hub had a turnover of approximately $283 million. The seafood hub of Mauritius is a cornerstone of the seafood and fishing business in the Indian Ocean. It comprises ten companies that make Mauritius a leading choice in that sector. It engages mainly in Shipping Agencies, Fishing Vessels, Reefer Vessels chartering for the transport of tuna from the certified fishing zone, private Quays in the port together with unloading and cold storage facilities, tuna processing of cooked loins, cans, tuna processing of raw frozen fish, fish meal manufacturing and a fully equipped shipyard for ship building and ship repairs. In the same vein, Mauritius Port Services amount to an annual turnover $ 250 million. The total turnover of the fisheries sector was around $ 600 million. The first quarter of 2012 has brought about a 35. 1% increase in the total export of fish and fish products. (Ministry of Fisheries Annual Report, 2010)

1. 4 TUNA FISHERY IN MAURITIUS

The tuna fishery is a major industrial fishing activity in Mauritius. It forms the basis of important local fish processing industries. Mauritius is an important tuna transhipment base in the South-West Indian Ocean. The temperate tuna fishery based on the albacore tuna is fished mainly by foreign longliners which tranship their catch in Port Louis. In Mauritius, the tuna fishery forms the basis for local fish processing industries and is a valuable contributor to its social and economic development. Tuna transhipment at Port Louis is

another important fish valuable related activity since several decades (NPOA-IUU, 1995). An artisanal tuna fishery has also developed around Fish Aggregating Devices (FADs) placed around Mauritius. The economic contribution of tuna and tuna like species stands at €250 million and there is the potential for such contribution to be further increased. The fishing methods adopted for tuna fishery in Mauritius include purse seine, longline and FADs. Tuna is exported to our main market which is the EU. Mauritius benefits from several agreements such as Mauritius EU fishing Agreement, Fishing Agreement with the Federation of Japan Tuna Fisheries Cooperative Association, Fishing Agreement with Seychelles and Memorandum of Understanding with Mozambique. These agreements help Mauritius to enjoy preferential market access. In each ocean, there are Regional Fisheries Management Organisations (RFMO) which manage tuna and tuna like species. In Mauritius, the export of tuna accounts for 90 % of total export value of seafood products. However, factors such as local catch, foreign catch, inflation rate, number of licences, transhipment, employment, foreign exchange, market price and imports affect the export. The industry can be a major pillar in the future only if Mauritius can ensure sustainability in its development.

1. 4. 1 The Mauritian Tuna Industry History

Before 1979, tuna was fished in Mauritius mainly with longlines and pole-and-line. The longline fishery started in 1970, but stopped operations soon after. Two small longliners started again in 1980, but, their catch was too low and had to stop operations. By 1995, there was only one longliner from Mauritius. In 2004, three foreign owned vessels came to operate in the

Mauritian water in longline fishery. Their fishing area was spread widely in the Western Indian Ocean. In 2007, the number of licences provided to longliners increased to 141, mostly from Taiwan, South Korea, Japan, Indonesia, Belize and Malaysia. In that year, a total of 15580 tonnes of tuna and related species were transhipped by these longliners of which 4268 tonnes were caught in the Mauritian EEZ. (NPOA-IUU, 1995)The purse seine tuna started to operate in 1979 with the first Mauritian purse seiner ‘ Lady Sushil’. It was operated as a joint venture involving Mauritius Tuna Fishing and Canning Enterprise and two Japanese companies. From then, it made pioneering fishery in the northern sector of the South West Indian Ocean and was one of the vessels to confirm the successful operation of purse seiner in the area. Eight years later, it was joined by a second vessel ‘ Lady Sushil II’. A third purse seiner ‘ Cirné’ started operation in 1991. Until 1997, they were operating for the local canning factory. However, due to financial problems and changes in the administration of the factory, the vessels were sold off in 2000 and the factories now rely on import of raw materials to meet its requirements (NPOA-IUU, 1995).

1. 5 Role of the Tuna Industry in Mauritius

Investment in the seafood hub in December 2005 amounted to Rs 2 billion. This sector is being promoted by the government in order to transform Mauritius into an impressive seafood hub for trading, warehousing, processing, distribution and export of fresh, chilled and frozen raw or value added seafood products (Bauljeewon, 2011). The Seafood hub is defined as " An efficient and attractive environment for the supply of value added processes and services related to the sourcing and marketing of seafood

products (Ministry of Fisheries, 2011)". In the seafood hub, tuna occupies a significant role. The balance of trade in 2010 amounted to Rs 2, 308, an improvement from that of 2009 which was Rs 1, 932. 9. It can be noted that tuna constitutes a high % in our fish trade. Processing of tuna contributes to Rs. 10. 1 billion (7. 8 processing and 2. 3 re-export). Mauritius was found to be among the two biggest exporters of canned tuna to the EU market among the ACP countries. It ranks 3rd in terms of overall EU canned tuna external supply, 3rd in terms of volume of overall EU tuna loins external supply and in terms of value. (Ministry of Fisheries Annual Report, 2010)At present there is no Mauritian vessel engaged in the industrial tuna fishery. All tuna fishing vessels operating in the Mauritius EEZ are foreign-flagged vessels which operate under fishing licences. Fishing licences are issued to purse seiners and longliners. Most of tuna fishing activities in the Mauritius EEZ is carried out by longline fishing vessels. In Mauritius, there are two main firms which are engaged in the processing of tuna. They are Princes Tuna Mauritius Ltd and Thon des Mascareignes. Not only in terms of exports, the tuna industry also contributes in terms of employment and food security.

1. 5. 1 Princes Tuna Mauritius Ltd

Tuna canning operation started in 1972 with raw materials from Madagascar and later from Maldives (NPOA-IUU, 1995). Since 2000, a modern new canning factory which is the Princes Tuna Mauritius Ltd was set up at Riche Terre. The factory is operated under a British-Mauritian joint venture. It has a processing capacity of 220 tonnes per day and a labour force of 2300 in 2010. The new factory satisfies all the norms and regulations for export to the European Markets.

1. 5. 2 Thon des Mascareignes

A second processing plant, Thon des Mascareignes started its operation in 2005 and is a subsidiary of the IBL Group. This factory is presently involved mainly in the production of tuna loins which are exported both to European and non-European markets. It processes 30 % of Albacore, 30 to 40 % of Yellowfin and 30 to 40 % of Skipjack. It offers a wide range of products namely industrial, semi-industrial and finished products. The raw materials are imported mainly from Seychelles. The factory has a daily processing capacity of about 230 tonnes and a labour force of 1800. The total export of processed tuna amounted to 20, 716 tonnes in 2011. Thon des Mascareignes continuously upgrades its premium products which aims at a real discover in taste. A Chef keeps looking for new flavours and choosing the ingredients with care. The packaging changes according to needs with glass jars, doypacks and cans.

1. 5. 3 Methods of tuna fishing in Mauritius

There are various forms of industrial tuna fishing namely purse seine, longline, Pole-and-line and troll. In the Indian Ocean, purse seine or longline ships and FADs methods are adopted. Tuna purse seining involves setting a large wall of net, approximately one mile in length to encircle tuna schools and entrap them (FAO, 2001). Longlining involves the use of line with baited hooks as fishing gears. It is made up of baskets which consist of a main horizontal line about 250 to 800 m long with 4 to 15 branch-lines each with a wire leader and a hook. FADs are floating objects that are designed and located to attract tunas. A FAD is made up of a large anchor, a heavy-duty mooring chain of about 30m long and a mooring rope. The rope and chain

are joined by various shackles, rope connectors, splices and thimbles. A flag is attached to be able to locate them. They may be placed in shallow waters 50-100m or deep waters 500-1500m (NPOA-IUU, 1995).

1. 5. 4 International Agreements for Tuna activities.

Mauritius has longstanding trade relationships with several economic partners including the EU, US and Japan. Under specific trade agreements, it benefits from unrestricted duty free access for its seafood products. It has also secured preferential access to many markets including EU through the Economic Partnership Agreement (EPA), with the US under the African Growth and Opportunity Act (AGOA), with Eastern and Southern Africa through the Common Market for Eastern and Southern Africa (COMESA) and Southern African Development Community (SADC). Mauritius also has fishing Agreements with the EU and the Federation of Japan Tuna Fisheries Cooperative Associations. These agreements allow the EU and Japan to fish in its EEZ provided they pay a license fee. Mauritian fishing vessels are able to fish in the Seychelles waters due to the bilateral agreements. Mauritius, Madagascar and Seychelles have benefitted from preferential access to the EU market which in turn has enabled them to invest more in their tuna canneries. In aggregate terms, the ACP share of production of canned tuna in the world experienced a rise of 5% to 12% during the years of 1976 to 2003 (Oceanic Development, 2005). To address tariff erosion, tuna processors in Mauritius have contributed significantly to form the African Tuna.

1. 5. 4. 1 ACP-EU Fisheries Access Agreements

Bilateral Fisheries Agreements between the EU and developing countries existed since long as the Common Fisheries Policy. These agreements show the goal of the EU to help the these countries in their development. There are 16 Fisheries Partnership Agreements at the moment. This enables EU fleet the right to use resources which its partners cannot or do not want to exploit. The EPA between the ACP and EU- the ACP-EU Partnership Agreement existed 2000 with the signing of the Cotonou Agreement (Technical Centre for Agricultural and Rural Cooperation, 2006). The tuna fishing agreements gives European the ability to obtain license fee under each agreement. Each ocean has to be controlled by international management such Regional Fisheries Management Organisations (RFMOs) which are regulated under the Indian Ocean Tuna Commission (IOTC) for the Indian Ocean, International Commission for the Conservation of Atlantic Tunas (ICCAT) for the Atlantic Ocean and Inter-American Tropical Tuna Commision (IATTC) for East Pacific (ISSF, 2012). The agreements provide a legal framework for accessing these resources and the tonnage of tuna that may be caught in the water of the country concerned, is specified together with the number of vessels that will receive a license (ISSF, 2012). Since the European Union (EU) accounts for some 60% of the ACP fishery exports by value, European market is an important player for ACP exports of fish and fish products (Gorez, 2003). Fisheries relations between ACP and EU are governed by various instruments like ACP National Fisheries Policies, EU Common Fisheries Policy, Development Cooperation Instruments and Bilateral Fisheries Agreements between the EU and ACP states (Gorez,

2003). The Bilateral Agreements facilitate access to fisheries resources through payment of access fees which generate income for ACP states together with joint venture activities (Gorez, 2003). In 1975, the EU and ACP signed their first co-operation agreement in Lomé, Togo (Mensah, 2010). After four such Lomé Conventions, a broader partnership agreement was signed in Cotonou Benin, in June 2000 known as the Cotonou Agreement (Mensah, 2010). The objectives behind this agreement were mainly to achieve sustainable development and poverty reduction. Under the Lomé Convention, ACP countries such as Ghana, Cote d'Ivoire, Madagascar, Mauritius, Papua New Guinea and Seychelles which are among the main exporters of tuna to the EU market benefit from zero and unreciprocated tariff on their canned tuna since 1982 (Mensah, 2010). This preferential tariff has helped ACP countries to compete with Asian tuna producing nations such as Thailand, Philippines, Indonesia and Vietnam which face 24% of duty tariff (Campling, 2007). This agreement is indeed very important for ACP countries to promote and boost up their trade (Campling, 2007). Without this, tuna industries in Seychelles, Mauritius, Papua New Guinea and Ivory Coast would have been less competitive in the European market. The export performance of these countries hinges on, a lot on the preferential access enjoyed under the Agreement (Mensah, 2010). In 2008, the Cotonou Agreement was replaced by EPA which is at the main economic and trade cooperation pillar of the Cotonou Agreement. The Economic Partnership Agreement (EPA) will slowly remove barriers to trade between the EU and the ACP countries (Campling, 2007). EPAs are based on World Trade Organisation (WTO) regulations and put EU and ACP trade on a secure and sustainable basis. The

ACP countries are divided into 6 regions which are Caribbean, the Pacific, East and Southern Africa (ESA), the SADC, West Africa (ECOWAS) and Central Africa (CEMAC) which are negotiating their own EPA (Campling, 2007). EPA aim at integrating ACP countries in the global economy through reciprocal access to the two markets and regional integration with the emphasis on promoting sustainable development and contributing towards poverty eradication (European Commission, 2013). EPAs make it easier for trade and investment to develop. With the Agreement, the ACP countries benefit from no quotas and duties on export of tuna to the EU (European Commission, 2013). This helps them to get access over a larger market, that is, European Free Trade Association (EFTA) including Switzerland and Norway. EU consumers will benefit from lower prices (European Commission, 2013). The removal of trade barriers enable ACP counties to compete with bigger Asian suppliers on the EU market. By accessing the EU market, ACP countries are able to expand their industry. This help in boosting and strengthening trade and contributes positively in the diversification of their economies. As far as EU consumers are concerned, they benefit from a variety of tuna products and have greater choice (European Commission, 2013). EPA agreement creates regional market. This contributes to the development of trade in ACP countries. With better techniques for tuna production, production capacity will increase. In the long run, trade will help ACP countries prosper and generate more income. The increase in demand for EU expertise will not only benefit ACP countries but will also generate jobs for the EU population. So, both will benefit. Producers Association comprise of 6 countries namely Mauritius, Seychelles, Madagascar, Kenya, Ghana and the Ivory Coast and 8

processors. This is to try and ensure that the EU hears the African voice. The main concern of Mauritian processors is to keep market access to the European Union.

1. 5. 4. 2Preferential market access

The EU has granted market access to the ACP countries since 1964 under the successive Lomé conventions and Cotonou Agreement (European External Action Service, 2012). Mauritius is a member of the Cotonou Agreement (European External Action Service, 2012). http://eeas. europa. eu/delegations/mauritius/eu_mauritius/trade_relation/index_en. htm The partnership agreement aims to promote and foster trade between the ACP countries and the EU. This enables ACP countries to benefit from zero and unreciprocated tariff on fish and fishery products exported to the EU by satisfying the required criteria and rules of origin (Mensah, 2010). Preferential access is also enjoyed in the USA under the GSP and the AGOA (Wong,).

1. 5. 4. 3 Mauritius EU fishing Agreement

In November 1990, a fishing agreement was signed between the EU and Mauritius under which five protocols were set up. They defined the fishing possibilities, licence fees and financial compensation for the period 03 December 2003 to 02 December 2007 (European Commission, 2012).

1. 5. 4. 4 Fishing Agreement with the Federation of Japan Tuna Fisheries Cooperative Association

This agreement was signed in May 2000 to allow Japanese tuna long liners to fish in the Mauritian waters and is renewed on a yearly basis (Ministry of Agro Industries and Fisheries, 2007).

1. 5. 4. 5 Fishing Agreement with Seychelles

Two fishing Agreements were signed in March 2005 between Mauritius and Seychelles on a reciprocity basis. They defined the fishing possibilities for 12 purse seiners and 20 long liners in each other's waters and the licence fees (Ministry of Agro Industries and Fisheries, 2007).

1. 5. 4. 6 Memorandum of Understanding (MOU) with Mozambique

A MOU in the field of fisheries was signed with Mozambique in Mauritius in March 2002. This was related to bilateral investment in fishing, aquaculture and fish processing (Ministry of Agro Industries and Fisheries, 2007).

1. 5. 5 Indian Ocean Tuna Commission

It is recognized that the tuna industry in the South West Indian Ocean (SWIO) region is under pressure due to the decrease in production of the purse seine fleet as a consequence of piracy. There are different RFMO's that are involved in the management of tuna and tuna like species. In the Indian Ocean and adjacent seas, the IOTC is responsible for the management of tuna and tuna like species (WWF, 2005). It is an intergovernmental organisation established by the FAO constitution under Article XIV (WWF, 2005). Its objective is to promote cooperation among its members and

responsible for the conservation and optimum exploitation of stocks through appropriate management and encourage sustainable development of fisheries in Mauritius and its neighbouring areas (United Nations Conference on Sustainable Development, 2012). Mauritius acceded the IOTC on 10 October 1994 (Ministry of Fisheries, 2012). It adheres to all resolutions regarding the sustainable exploitation of tuna resources. In this respect, the National Plan of Action has been put in place to monitor and control fishing activities in order to combat IUU in the region.

Figure 2: IOTC Area of Competence

Source: IOTC

1. 6 Factors affecting the development of the tuna industry

Cost of inputs

The major factors contributing to the operating costs are raw material, labour and fuel costs (Miyake, 2005). The most important input of the industry is the tuna fish itself. It is usually sold fresh, frozen and canned. The situation of the price of tuna is dynamic and therefore changes rapidly due to many factors (Pan, 2004). Seasonality – of both fishing (low production in the Indian Ocean occurs during the European summer) and markets (better prices occur in the EU because of increased demand during the European summer). Rising labour and fuel cost lead to a rise in operating costs thereby affecting the price of tuna. A rise in the price of tuna will increase cost of production of the processing industry and eventually reduce profit and future investment. Conversely, if tuna is cheap, cost of production will fall and the

industry can increase production and supply at a lower price in the local and foreign markets to increase its competitiveness.

Technology

The development of new technology in the tuna industry is identified by Miyake (2005b). Through more effective fishing techniques and more sophisticated vessels, there is an increase in the productivity and hence supply (Miyake, 2010). However, it is important that fishing entrepreneurs have access to the necessary financial resources to acquire these new techniques in order to carry out innovation in their activities. Also, improvements in terms of the use of many mitigation device and procedures such as circle hooks instead of J-hooks may affect the fishing efficiency (Miyake, 2005a). Apart from the traditional fishing gears such as long line and purse seine, today it is possible to locate schools of tuna at sea by using echo sounders and the support of satellite system (Dagorn, 2012). Further, innovation in canning techniques contributes to improve productivity and efficiency (Laxe, 2008).

Natural Influences

The weather, cyclones and tsunamis affect the catch and supply of tuna. According to Schon (2000), Roberts and Sauer (1994), catch variability are linked with wind direction, turbidity, sea surface temperatures and oceanographic phenomena such as upwelling and climatic conditions. But, more important is global warming which changes the temperature of the sea and hence alter the current pattern and distribution of tuna. Generally, tuna

schools are highly migratory species and they move in the Indian Ocean during summer season.

Illegal, Unreported & Unregulated fishing (IUU) and Piracy

IUU fishing is a major threat to the long-term sustainability of the world's oceans (World review of fisheries and aquaculture, 2012). They occur when fishing is performed without permission to relevant state, unreported to them and unregulated that is by changing their flags to non-contracting parties (Schmidt, 2004). IUU fishing depletes fish stocks, destroys marine habitats and distorts competition particularly in developing countries. The EU and the US are the world largest importers of seafood. On the 26th September 2011, they signed the joint agreement in Washington to increase cooperation against IUU. ' Piracy is another threat to the tuna fisheries', highlighted Joel Morgan, Seychelles Minister of Environment, Natural resources and transport (Kyama, 2011). Seychelles revenue has suffered a drop of 30% over the past year due to pirate attacks originated in Somalia. The Government of Seychelles is working together with the EU, the US, India and other partners to patrol its waters and establish a regional VMS with the support of satellite system (Kyama, 2011). Piracy has emerged as a potential threat to fishing activities being carried out in the Mauritian zone also. As a consequence, this may deter local and foreign companies to venture and investment possibilities will be risky. Due to piracy, the number of EU purse seiners operating in the Indian Ocean has fallen leading to a fall in the supply for originating fish for the Mauritian factories. The last five years have seen a reduction in fishing effort by 30% leading to decrease on production by 15-

20%. In addition, continuous increase in costs mainly due to security has led to a rise in the cost of fish. (Robert, 2012)

Increased Investment

The availability of sufficient funds to efficiently manage processing facilities are key factors in the fishing industry. SSA countries have been able to sustain the operations due to foreign direct investment from countries to which they supply their fish. These investments were obtained by foreign plants which operate in the SSA countries namely StarKist in Ghana and Seychelles and Princes' in Mauritius. These plants produce for the EU market, under labels owned by their parent firms (United States International Trade Commission, 2007).

Government Policy and Agreements

Havice and Campling (2010) highlighted that institutional and political regulations are necessary to control the access for tuna fisheries. The government can influence the supply of the tuna by using taxation and subsidies or grants. A rise in tax on the profits of tuna fishing companies will increase their costs and reduce profits. Then, some companies may decide to contract their activities while others can stop completely. Conversely, if a subsidy or grant for the innovation in fishing fleets is given, companies will be encouraged to invest more in tuna fishing. In Mauritius, the Ministry of Fisheries provides the necessary support services to such companies and ensures enforcement to prevent illegal fishing. Many countries issue licenses to limit the entry distant water fleets which come to harvest in their territories and is common in many national fisheries (Townsend, 1990; Wilen,

1988, and Sinclair, 1983). The EU is the most active foreign player. Issue of licences impacts a lot on exports. The distant water fleets usually land their catches in the SSA country's ports, which lead to a rise in the supply of fish to local canneries (United States International Trade Commission, 2007). Licences are provided to fishing companies from Taiwan, Japan, Korea, China and EU countries to fish in our EEZ under specific conditions. An agreement exists with Seychelles over the license fee which is preferential in return for cheaper tuna exported to Mauritius to be used as raw material for canning. According to Guidetti (2006), the number of Marine Protected Areas established has increased significantly in recent years. These areas are not only seen as nature conservation instrument but as a useful tool against declining coastal fish resources as well as attracting tourists (Badalamenti et al., 2000; Claudet et al., 2006). Moreover, since the majority of tuna stocks have been overfished, regulatory measures are being enforced so as to protect the remaining stock. These measures include catch quota and effort limitations but also other measures such as time-area.

Export of Tuna

Exports in no small way contribute a lot to the economic growth of any country. According Samiee and Walters (1990), the export performance of any country is regarded as an apparatus for boosting sales revenue, growth, survival and reinforcing competitive edge. High and increasing exports by encouraging specialisation according to comparative advantage improve static and dynamic efficiency and promote economic growth (Gylfason, 1997). Table 3. 1 shows total export of fish and fish products for 1994-2010.

Table 3. 1 Total Export of fish and fish products 1994-2010.

Year

Export

Qty(t)

Value (MR)

1994

9662543

1995

13570658

1996

13820780

1997

15955922. 4

1998

13014972. 2

1999

15206968

2000

38151961. 5

2001

473811840. 8

2002

495604081

2003

487193178. 4

2004

542413358. 1

2005

672494842. 1

2006

797077120. 4

2007

861708170. 8

2008

834827931. 7

2009

879389041. 2

2010

10474010118Qty (t) = Quantity in tonnes MR= Million RupeesSource:

Ministry of FisheriesFigure 3. 1: Total Export of fish and fish products 1994-

2010. Qty (t) = Quantity in tonnesSource: Author’s ComputationData:

Ministry of Fisheries.

3. 1. 2 Factors affecting Export of tuna

Catch

The total catch comprises catch by local and foreign vessels. It is a factor which affects tuna export. A rise in total catch will increase supply of tuna and hence enable processing firms to export more. But, a fall in local and foreign catch will reduce the supply of tuna, resulting in a fall in export. Figure 3. 3 shows total catch for the period 1994-2010. Figure 3. 3: Total Catch of tuna in tonnes 1994-2010. Qty (t) = Quantity in tonnesSource: Author's Computation. Data: Ministry of Fisheries. From the above diagram, we can see that between 1994 and 1999, catch fluctuated. From 2000 and 2010, it has decreased from 7322 to 5565 tonnes. But, in 2007, we had the highest catch of 15580 tonnes. In 2008, catch fell significantly. This is because there were no EU longliners fishing in our waters as no licences were issued to them.

Number of Licences

Licences are issued to foreign fishing vessels either under fishing Agreements between Mauritius and other states or to individual fishing vessels. An increase in the number of licences given will increase catch and this will contribute towards raising exports. But, if government adopts a restrictive policy, less licences will be issued and exports can eventually fall. Figure 3. 4 shows the number of licences for the period 1994-2010.

Figure 3. 4: Number of Licences 1994-2010.

Source: Author's Computation. Data: Ministry of Fisheries. From the diagram, we can observe that the number of licences has increased from 19 in 1994

to 190 in 2010. However, we can notice that in 2008, there has been a significant fall from 200 in 2007 to 97 in 2008. This was due to the phasing out of the EU fishing Agreement in 2007.

Transhipment

Since 1965, Port Louis serves as an important transhipment base. Each year about 600 to 700 calls are noted there. From 1994 to 2010, the total tuna transhipped has increased from 14225 to 43729. Figure 3. 5 show the total tuna transhipped.

Figure 3. 5: Total tuna transhipped 1994-2010.

Qty (t) = Quantity in tonnesSource: Author’s Computation. Data: Ministry of Fisheries. From the above, we can see that total tuna transhipment has increased from 14225 tonnes in 1994 to 43729 tonnes in 2010.

Import of tuna

In Mauritius, we have to import tuna in order to supply the processing plants which will then be exported. A rise in imports helps in increasing export. However, the rise in imports will have a negative impact on the Balance of Payments. This situation can be solved if Mauritius exploits its EEZ of 1. 9 million km2 effectively. Figure 3. 6 shows the imports of tuna from 1994 to 2010.

Figure 3. 6: Import of tuna 1994-2010.

Qty (t) = Quantity in tonnesSource: Author’s Computation. Data: Ministry of Fisheries. From the above, we can observe that import of tuna has increased tremendously from 8696 tonnes in 1994 to 153518 tonnes in 2010. Here, we

can observe that imports rose in 2008 due to the phasing out of the EU fishing Agreement and Mauritius had to import more in that period.

Employment

Employment is important to every country. If labour resources are used efficiebtly, I can contribute to the growth of the economy (Kuldilok, 2009). According to BBC Three (2009), employees who work in tuna manufacturing plant usually work five-six days per week from 7am to 5pm. The level of employment in tuna factories depend on orders and the demand for tuna. In case of high demand for tuna, tuna factories may need to employ more workers to meet the increasing demand (Kuldilok, 2009). Thus, a rise in employment in processing plants will enable the firms to produce more, and hence increase exports. A fall in employment will reduce output and cause export to fall. Figure 3. 7 shows the number of people employed in the tuna industry. Figure 3. 7: Employment in the tuna industry for the period 1994-2010. Source: Author’s Computation. Data: Ministry of Fisheries. From the diagram, we can see that from 1994 to 1996, the number of people employed rose. But, fell in 1996. From 1997-2004, the number of people employed was quite stable. But, in 2005 and 2006, it experienced a rise. In 2007, it fell and from 2008-2010, the number decreased.

Inflation

Inflation affects the price of tuna which in turn lead to a rise in production costs which are passed onto consumers (Kuldilok, 2009). High inflation has tended to be associated with low exports (Gylfason, 1997) and hence decrease tuna export. Figure 3. 8 shows the inflation rate in Mauritius for the

period 1994-2010. Figure 3. 8: Inflation Rate for the period 1994-2010. Source: Author’s Computation. Data: Ministry of Fisheries. From the above diagram, we can see that the rate of inflation has been fluctuating over the years. In 2008, Mauritius experienced the highest inflation rate at 9. 7% which accounted partly for the slow rise in exports. But in 2009, it fell to 2. 5% which explains the significant rise in exports in 2010.

Exchange Rate

It has a crucial role in tuna exports (Kuldilok, 2009). If the Mauritian Rupee appreciates, Mauritius loses competitive advantage on the international market. But, a weak currency has positive effect on the tuna exports. Figure 3. 9 shows the value of the Euro vis-à-vis the Mauritian Rupee. Figure 3. 9: Exchange Rate for the period 1994-2010. MRU = Mauritian RupeesSource: Author’s Computation. Data: Ministry of FisheriesFrom the above diagram, the Mauritian Rupee showed some stability but became weaker in the period 2000-2008. Afterwards, it showed a sign of catching up. This can account for the slow growth in tuna exports between 2008 and 2009.

Market Price

According to the law of demand put forward by Marshall (1980), there is an inverse relationship between price and demand. A rise in the price of tuna will cause demand to fall. As a result, this will reduce export. A fall in price will increase demand and hence export. Figure 3. 10 shows the market price per tonne of tuna that prevailed for the period 1994-2010. Figure 3. 10: Market price per tonne of tuna for the period 1994-2010. Source: Author’s ComputationData: Ministry of Fisheries. From the diagram, we can see that

the price of tuna per tonne rose from 1995 to1998. From 1998 to 2000, it fell. From 2000 to 2002, it rose due to increase in demand for tuna by the EU, fell in 2003 to 2004 and then followed a rising trend from 2005 to 2009. In 2010, we can notice a fall compared to 2009.

3. 2 Problems and challenges facing the Mauritian tuna industry

Though the tuna fishing industry contributes significantly in the economic development, it is recognised that inherent weaknesses of the local fishing companies, coupled with emerging external factors hamper investment for expansion of the sector. Problems such as reduction in the availability of raw materials, food security, increasing competition and rise in operating costs may undermine the sustainability of the industry. In addition, there is indication that preferential access to the EU market is presently not a guarantee for the long-term and the EEZ extension represent real challenges which will require the government to devise new strategies to make the tuna industry more sustainable and make it a pillar of the economy. Piracy has emerged as a potential threat to fishing activities being carried out in our zone. As a consequence, this deters local and foreign companies to venture and investment possibilities will be risky. Due to piracy, the number of EU purse seiners operating in the Indian Ocean has fallen leading to a fall in the of raw materials for the Mauritian factories. The last five years have seen a reduction in fishing effort by 30% leading to decrease on production by 15-20%. Mauritius is dependent on imports of tuna to a significant extent as local production is not sufficient enough to supply the processing plant with raw materials. So, we have to import tuna from Seychelles which is endowed

with rich tuna fishing grounds. This dependence on imports can cause future instability in supply and hence put the sustainability of the industry at stake. It is difficult to monitor, control and enforce surveillance effectively. There is a lack of resources in terms of funding and trained personnel. Illegal fishing by foreign fishing vessels still causes a problem to existing Monitoring and Controlling Surveillance System (MCS). So, the country is foregoing benefits as a consequence from these prevailing activities. At the same time, the possibility of causing damage to our marine environment has increased.

3. 3 The need for sustainable fishery

Sustainability is the Holy Grail part for the various stakeholders involved in fisheries management such as biologists, environmentalists. The belief underlying sustainable development of the fisheries sector is that it must be managed in such a way that it does not cause overfishing and for stocks which are already on the verge of exploitation must be managed so that they can recover from depletion. Moreover, efficient fishing methods should be used so as not to affect the marine environment. The NGO Greenpeace convinced most retailers in the UK which ranks second in the world for canned tuna consumption to start selling only FAD free tuna. The tuna industry has paved the way to sustainability by protecting the marine environment and devise efficient ways to preserve tuna stocks for the future generations. The UK has not only raised the bar but it has excelled as the world most sustainable tuna market. Tuna caught from FADs are not accepted anymore and it is now becoming a worldwide trend. Well recognised supermarkets such as Sainsbury, Waitrose and M&S in the UK have already adopted sustainability standards by selling FAD free tuna.

(Greenpeace, 2012)Mauritius is currently at a critical juncture where ineffective regulations, inefficient fishing methods and illegal fishing are continuously destroying the tuna stocks. In discussion with the Mauritian government, it was found that proper management of the fisheries, reduction in the number of fishing fleets plundering the seas and conservation of the marine environment can help in alleviating the overfishing problem. It was highlighted that only by taking effective actions to protect the marine environment which is constantly under threat will help to protect the livelihood of the coastal regions and sustain food security for the present and future generations. The aim underlying the expedition was to identify the harms resulting from overfishing and unsustainable fishing practices and to make sure that the future generations will reap high benefits from the wealth from the oceans. Implementation of a responsible fishery management to eliminate overfishing and the setting up of Marine Protected Areas to cover 40% of the oceans around the world is no longer seen only as an instrument of nature conservation but as a useful tool against declining coastal fish resources as well as sustaining ample seafood for people in the future. Overfishing has put the life of many fishermen as well as that of their family at risk. Mauritius is not left behind also as the use of poor quality fishing materials and illegal fishing are leading to the degradation of the marine ecosystem hence limiting the catch levels. It can be noted that Mauritius lies at both extremes when it comes to the sustainability spectrum. Mauritius has the opportunity to decide whether it wants to achieve sustainability for its fisheries for the short term only or for the long term. On the short term aspect, Mauritius can reap high revenue by

enabling foreign-flagged vessels to operate in its EEZ under fishing licences but at the expense of a fall in the level of catch and the destruction of the environment. On the other hand, if Mauritius aims at sustaining food security and preserving the marine environment be viewed as a pioneer in the Indian Ocean as a sustainable seafood, it has to take ownership of its water. The Rainbow warrior is an environmentally friendly ships designed specifically for Greenpeace to patrol different oceans. It has a significant role in the Greenpeace campaign in that it provides Greenpeace with the opportunity to identify problems facing the marine environment and to take effective actions to eradicate environmental crimes globally. The Rainbow warrior has been recently patrolling the Indian Ocean seas including Mauritius and it was found that Indian Ocean seas are currently at a critical juncture where ineffective regulations, inefficient fishing methods and illegal fishing are continuously destroying the tuna stocks. It was also found that illegal fishing is persisting and unsustainable fishing is on rise which puts the economy and food security at risk. Regulations and Policies placed to monitor and control the exploitation of the fishery resources such as catch quotas and the closure of some fishing zones limit catches. In addition, yearly volume catches and that of processing capacities are more or less balanced. So, the risk of stock outs is high. Further, there is no longer the possibility to undertake Intra ACP sourcing. It is regarded as a Cotonou Minus. However, there do involve opportunities in the sector upon which Mauritius can rely on to ensure sustainability of its fisheries. Concerning eco-certification, Mauritius is a member of the Indian Ocean Tuna Operators Association (IOTOA) which was set up in 2011. The primary objective of the IOTOA is to

establish eco-certification for tuna seine fishing and canning for countries in the region so as to promote sustainability. Value added activities in the sector keeps on improving with the setting up of new factories to process sashimi grade tuna below 40 degrees. The Mauritian tuna industry constitutes of various legal framework and policy measures to preserve the industry. A new policy has been implemented to promote sustainable fisheries development and management. The main aim of the policy is to boost up revenue, maintain employment, foster both local and international investment and to ensure sustainability. The strategy hinges upon the consolidation of the Sea Food Hub with the aim of encouraging foreign investment in the country, create more jobs with a lot of emphasis on other fish related activities.