YANGON UNIVERSITY OF ECONOMICS

MASTER OF ECONOMICS

A STUDY ON FISHERY EXPORT IN MYANMAR

SU HLAING MOE

SEPTEMBER, 2018

YANGON UNIVERSITY OF ECONOMICS
MASTER OF ECONOMICS

A STUDY ON FISHERY EXPORT IN MYANMAR

A thesis submitted as a partial fulfillment towards the requirements for the Degree of Master of Economics

Supervised by:

Daw Hla Theingi Swe
Lecturer
Department of Economics
Yangon University of Economics

Submitted by:

Su Hlaing Moe
Roll No. 7
MEcon (Eco)
(2016-2018)

September, 2018

YANGON UNIVERSITY OF ECONOMICS

MASTER OF ECONOMICS

This is to certify that this thesis entitled, "**A Study on Fishery Export in Myanmar**" submitted as a partial fulfillment of the requirements for the Degree of Master of Economics has been accepted by the Board of Examiners.

Board of Examiners

1. Professor Dr. Tin Win
   Rector
   Yangon University of Economics — (Chief Examiner)

2. Professor Dr. Ni Lar Myint Htoo
   Pro-Rector
   Yangon University of Economics — (Examiner)

3. Professor Dr. Cho Cho Thein
   Professor and Head
   Department of Economics
   Yangon University of Economics — (Examiner)

4. Professor U Aung Myint
   Rector (Retired)
   Monywa University of Economics — (Examiner)

5. Professor Daw Aye Aye Myint
   Professor and Head (Retired)
   Department of Economics
   Yangon University of Economics — (Examiner)

(Than Soe Oo)
Head of Department
Academic Affairs
Yangon University of Economics

SEPTEMBER, 2018

ABSTRACT

The production and export sector is contributing as an important role of economic growth of nation. Thus, the production and export of fishery products in Myanmar from (2007/08) to (2016/17) was studied. The fishery sector is recognized as an important economic sector for the country. The descriptive method and secondary data are used for this study. The objective of the study is to support the improvement of fishery in Myanmar. The export of fisheries products is increasing because the area of fish ponds were expanded due to the freshwater fisheries law enacted in 1991. A government should make the policy which encourages more investment in the production must provide the infrastructure such as electricity which is key for cold storage in the fish value chain to promote fishery exports of Myanmar. In Myanmar, the Livestock and Fishery sector is the fourth largest after agriculture, trade and processing and manufacturing. The fishery sector is key important to the economy and to the social well being of Myanmar.

ACKNOWLEDGEMENTS

Firstly, I would like to express my high gratitude of Professor Dr. Tin Win, Rector, Yangon University of Economics.

Secondly, I also deeply indebted to Professor Dr. Ni Lar Myint Htoo, Pro-Rector, Yangon University of Economics for her effective and efficient administration support of this thesis.

Thirdly, may I express thankfulness to Professor Dr. Cho Cho Thein, Head of Department of Economics, for allowing me to submit and helpful guidance for this research paper.

This thesis would not be possible without the constant guidance of my supervisor, Daw Hla Theingi Swe, Lecturer, Department of Economics, Yangon University of Economics, who is always spending her valuable time on guiding and supervising throughout the whole thesis.

Fourthly, I would particularly like to thank and appreciate U Phone Maw (Officer, Sea Turtle Conservation Station, Thameehla Island, Department of Fisheries), U Aung Htay Oo (FAO National Consultant Fisheries. TCP/MYA 3601 Project), U Thet Naing (Deputy Director, Research and Development, Department of Fisheries), responsible persons in Department of Fisheries and Myanmar Fishery Federation for their willingness to support me and by sharing experiences and information and for providing necessary data and documents for my study.

Finally, I wish to express my heartfelt gratitude to my parents who give all round support and encouragement during the course of my study and thanks are also due to my classmates for their co-operation in various ways.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADB	= Asian Development Bank
AFTA	= ASEAN Free Trade Area
ARDC	= Agriculture and Rural Development Cooperation
ASEAN	= Association of South East Asia Nations
BEDC	= Burma Economic Development Cooperation
DOF	= Department of Fisheries
EEZ	= Exclusive Economic Zone
EU	= European Union
FAO	= Food and Agriculture Organization
GDP	= Gross Domestic Product
GHP	= Good Hygienic Practices
GMP	= Good Manufacture Practice
GMP	= Good Manufacture Practice
HACCP	= Hazard Analysis Critical Control Point
JICA	= Japan International Cooperation Agencies
MFF	= Myanmar Fisheries Federation
MLFDB	= Myanmar Livestock and Fisheries Development
MT	= Metric Ton
WTO	= World Trade Organization

Chapter (1)

Introduction

1.1 Rationale of the Study

Fish and fish products are becoming more increasingly important as primary source of protein for many peoples. They fulfill requirement of protein, important vitamins, minerals and omega 3 fatty acids for a human body.

Fishery is an important economic sector of throughout the world. Fishery sector plays a crucial role in the production of food, generation income and consumption, offering employment opportunities and earning foreign exchange for Myanmar economy. The fishery sector is considered as the most important one after the agricultural sector to fulfill the protein requirement of the people of Myanmar and to provide the food security as well as to get the opportunity for the employment to a large number of rural communities and rural peoples.

Myanmar has fishery resources and extensive inland waters and a long coastline of 2832km along the upper eastern side of the Bay of Bengal with abundant marine and reveries fishery resources. Myanmar has rich fisheries biodiversity including 310 freshwater fish species and 465 marine fish species.

Fisheries sector contributes it higher to the national GDP and also important as a source of export earnings. The role of fisheries becomes more significant in the recent decade by increasing its share in GDP. The contribution of 7.6% in 2007/2008 was increased to 7.8% in 2015/2016.According to the statistics of 2016/2017, the Union of Myanmar has a population (52.9) million and the per capita consumption of fish was (99) kg in the fiscal year 2016/2017.

In 2016/2017 fiscal years, the total production of fish was 5.67 million tons in Myanmar. In this period, the production of freshwater fish was 2.64 million metric tons

(47% of the total fish production) and the production of marine fish was 3.03 million metric tons (53% of the total production of fish in Myanmar).

The exported amount of fish and fishery products was (0.439) million metric tons and the value of which was (605.820) million in US$ in 2016-1017. The exported amount was (8%) of the total production of fish in Myanmar in this period, 2016/2017. The Department of Fisheries (DOF) reports that fisheries are the fourth most important source of export earnings. Although there were 20 countries which were importing Myanmar fishery products in 1993/94, it increased to 40 countries in 2016/2017. Major importer countries of Myanmar fishery products are Singapore, Thailand, Hong Kong, China, Japan, Malaysia, Austria, Britain, USA and Indonesia.

The Asia region is a major supplier of fish products to the European market. The aquaculture sector in a number of Asian countries has become an important producer as well as exporter of various captured and cultured seafood products. Since Myanmar is in transition to democracy and the EU decided to remove most sanctions to fuel economic development, Myanmar is very interesting for the European seafood industry.

1.2 Objective of the Study

The main objective of this research paper is to study how the fishery sector provides the economy of the country during the period from 2007/2008 to 2016/2017.The objective of the study is to support the improvement of fishery export in Myanmar.

1.3 Method of Study

Descriptive method is used and data and information are collected from secondary sources. Sources of data are from the department of fisheries of Myanmar, Myanmar Fisheries Federation (MFF), relevant department organization books, papers and internet websites.

1.4 Scope and Limitation of the Study

The study is focused on the fishery production and its export in Myanmar. The data analysis is based on year 2007 to 2017.This study specialize the production and export of fish and prawns rather than other fishery products.

1.5 Organization of the Study

This paper includes five chapters as follows; Chapter(1) is introduction section, set up with rationale of the study, objective of the study, method of study, scope and limitations of the study and organization of the study. Chapter (2) studies the importance of fishery sector, the determinants of exports, the performance of export, export and economic growth, export policy in Myanmar and review on previous studies. Chapter (3) explains about an overview of fishery industry in Myanmar. These are a background history of fishery sector, institutions of Myanmar fisheries sector, fisheries policies and plans, percapita fish consumption, production of marine fishery, production of freshwater fishery and contribution to GDP by fishery sector in Myanmar. Chapter (4) focuses the role of fisheries exportation in Myanmar. They are trade policy, top ten species of exported fish and fishery products of Myanmar, export of fish and fishery products of Myanmar, seafood exports markets, organization or companies for fisheries export, composition of fishing vessels in Myanmar and challenges for exports. Chapter (5) includes conclusion and findings.

Chapter (2)

Literature Review

2.1 Importance of Fisheries Sector

Fishery is an important sector for the socio-economic development of a nation and also important as a source of export earnings. The importance of fisheries in a country cannot only be measured by the contribution to the GDP, but one must also take into consideration that fisheries resources and products are fundamental components of human feeding and employment (Vella 2009). As a part of primary production sector, fisheries and aquaculture provide numerous jobs of production in ancillary activities such as processing, packing, marketing and distribution, manufacturing of fish processing equipment, fishing net and gear making, boat construction and maintenance, research and administration. All of this employment, together with dependents, is supporting the livelihoods of people. Thus, fishery is an important sector and plays a significant role in livelihoods and employment of people.

The more considerable and substantial contribution of fisheries worldwide is the supply of highly nutritious animal protein for human consumption and the employment and income generation in often-remote coastal areas. While globally some seventeen percent of the animal protein supply is derived from fisheries, in many developing countries—especially in the Asian region that is home to nearly two-thirds of the world's population (Tsen 2010).

Historically, fishing has been a major source of livelihood for coastal and inland fishing communities as well as a source of healthy food for humanity at large. Fisheries sector occupies a very important place in the socio-economic development of the country. It has been recognized as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries and is a source of cheap and nutritious food besides being a foreign earner. Most importantly, it is the source of

livelihood for a large section of economically backward population of the country (Briguglio 2009).

Thus, fish is highly nutritious, minerals, essential fatty acids and proteins, and represents a valuable supplement to diets otherwise lacking essential vitamins and minerals. The fishery sector provided livelihoods and income for people engaged in the primary sector of fish production, processing, marketing and related sectors of economy.

2.2 The Determinants of Exports

Exports promotion strategy is oftenin accordance with the principle of comparative advantage, when a country specializes ina product, which it can produce competitively. The goods become available to the community of the world at cheaper prices. The markets are extended. The internal andexternal economies are attained. Income and employment levels expand. Consequentlyprocess of economic development is facilitated. The promotion of exports would permit the optimal allocation of world resources and,therefore, returns from trade sector depend upon accelerating growth of exports (Edwin Emmanuel Ukama, 2012).

The higher level ofproduction is the main cause of export expansion, because surplus of output can beexhausted in international markets. In a close economy surplus of production leads to fallin prices, which, in turn, creates pessimism among producers. In an open economy suchsurpluses create foreign reserves by exporting production. So, the higher production level can have the positive impact of export growth. In empirical literature Kumar (1998) confirms thepositive impact of GDP on exports (AtharasiaStylianouKalaitzi, 2015).

Growth of the GDP is an indicator of future potential and sustainability ofproduction level. Growth is more valid determinant of exports as compare to GDPbecause it measures the sustainability of output levels.

A fall in the relative domestic prices due to exchange rate depreciation makesexports cheaper in international markets resulting in increased demand for exports,the real exchange rate can have the positive impact on export growth.

Large size of official development assistance implies is likely to facilitate growthof infrastructure, which in turn will favorably affect investment climate. Therefore, this variable can have positive effect on export growth.

Optimum utilization of resources depends upon the labor force. Labor forcepositively determines production levels. In developing countries large volume of laborforce in agriculture sector can be transferred in industrial sector without affecting theoutput of agriculture sector, because this sector is confronted with the problem ofdisguised unemployment. Such labor force can be properly utilized in industrial sectorthat in turn expand export sector. In empirical literature, Pfaffermayr (1996) justifies thepositive impact of labor force on exports.

Skilled labor force is the source of competitiveness in production and lower costof production. Many developing countries exploit the advantages of skilled labor force for competitiveness in export sector. At the same time many developing countries have unskilled labor force. The effect of unskilled labor force is opposite on competitivenessin export sector (Muhammad Tariq Majeed, 2006).

2.3 The Performance of Export

The globalization of the world economy and the common view that increasingexports has benefits for society has encouraged research into the field ofexports (Liargovas& Skandalis, 2008). Differences in economic growth havecreated differences in income across countries, which transform into significantdifferences in living standards and other indicators of the quality of life(Brzezinski &Dzielinski, 2009). Developing and highly advanced countries arebecoming aware of the importance of prioritizing exports in national planningpolicies, although export-led growth policies have largely been implemented bydeveloping countries (Liargovas& Skandalis, 2008).

There is a dynamic relationship between exports, domestic demand andeconomic growth, with exports and domestic demand being important foreconomic growth (Tsen, 2010). Moreover, economic growth has a positiveimpact on exports and

domestic demand, meaning that successful andsustained economic growth requires growth in exports and growth in domesticdemand (Tsen, 2010).

Factors not in the control of the country have also not received enough attentionin export performance research (Baldauf, Cravens & Wagner, 2000). A betterunderstanding of how these factors influence export performance could assist inclarifying some unanswered empirical questions such as those raised byBlalock and Roy (2007), who looked into reasons why Asianexportperformance did not improve after the Asian financial crisis of 2007. They werefaced with the dilemma that the results of their empirical study were largelyinconclusive. Export performance did not improve despite the fact that terms of trade improved in favor of exports as Asian currencies devalued, the level ofentrepreneurial ambition was unchanged and firms that exported behaved in thesame way as firms that were not exporting (Blalock & Roy, 2007).

Export instability is by no means the only cause of economic vulnerability, withother important factors being low levels of economic development, loweconomic growth and high levels of income inequality (Guillaumont, 2010).Briguglio, Cordina, Farrugia and Vella (2009) also included economic opennessand reliance on strategic imports as factors contributing to economicvulnerability. However, the larger the share exports of GDP, the larger theimpact of an export shortfall (Guillaumont, 2010). The literature (Agosin, Alvarez& Bravo-Ortega, 2012; Athukorala, 2009; Meilak, 2008; Feenstra, 2008)suggested that export concentration can make a nation vulnerable to externalchanges. Therefore, global output and demand fluctuations affecting a country'sexport performance may have serious implications on a country's overalleconomic vulnerability (Guillaumont, 2010).

A general insight is that open economies and economies with diversifiedexports seem to be less vulnerable than those economies with a high exportconcentration (Naude, McGillivray &Rossouw, 2008). However, there isconsensus through many studies that export instability has a negative effect ongrowth (Naude et al., 2008). Guillaumont (2010) suggested that exportinstability was increasing and was significantly higher in less developedcountries (LDCs), while it was decreasing in small

island developing states(SIDS). One of these factors wasa dependence on commodity exports and reduced export diversity.

The ability of an economy to recover from the effects of adverse shocks and theability to withstand shocks are, therefore, two key contributors to economicresilience (Briguglio et al., 2009). Should a strong relationship emerge betweenexport performance and international economic growth, then an implication isthat a country has to seek alternatives that will mitigate this effect as it impactsthe overall economic resilience of the country.

2.4 Exports and Economic Growth

The role of exports as an engine for economic growth is a constant subject of debate in the economic growth literature. The classical school of economics argues that trade stimulates the economic growth through exports of surplus (Smith, 1776) and utilization of comparative advantage (Ricardo, 1817). According to these theories, countries can benefit from trade by specializing in the production of those goods, for which their resources are best suited and gaining materials, which could not produce. However, these gains are once for all and could be raised through Free Trade Agreements. In contrast, the indirect gains, so-called "dynamic gains" such as the increase in investments, the inflows of foreign exchange and technology, the imports of capital goods and the specialization in production could accelerate economic growth. It is interesting to note that these theories do not take into account negative factors for economic growth, such as differences in price behavior between countries and the decreasing demand for primary products, which could lead to deterioration in country's terms of trade.

According to other theories, trade often strengthens in the first instance the developed countries whose exports consisting of manufacturing products, while the under-developed countries are in danger of deterioration in terms of trade. As noted in Chaudhuri (1989:39), Ricardo argues that trade can increase output if the country imports "the commodity that used the fixed input (land) in production and export non land-using manufactures, but not otherwise" (Chaudhuri,1989:39). Berrill (1960)

indicates that the international trade and the export expansion could be an obstacle for the growth of small developing countries.

In particular, as Chaudhuri (1989) notes, if trade between low and high income countries lead to the former specializing in the production of labor-intensive goods, trade can be an obstacle for further growth. Specifically, the exports of low-income countries are mainly primary products, which are subject to excessive price fluctuations and have inelastic demand in the export market. Therefore, the export market for the least developed countries is not greatly enlarged. Moreover, the revenues of these exports are directed towards increasing the primary production and this often develop an on-going cycle, widening the gap between developed and developing countries (Myrdal, 1957).

In addition, Myrdal (1957) notes that the commercial exchanges between developed and developing countries could lead to deterioration in the terms of trade, increasing the differences between them. As Myint (1954) argues, the deterioration in terms of trade in developing countries is caused by the differences in price behavior between developed and developing countries and the decreasing demand for primary products.

The study by Meier (1970) demonstrates that an increase in exports of industrial products leads to the expansion of industrial sector and affects positively the domestic income, only if there is an increase of demand for the domestic production. In addition, according to Kindleberger (1962), for a positive effect from exports to economic growth, "there must be capital formation, technical change and reallocation of recourses" (Kindleberger, 1962:204).In addition, Myint (1958) shows that the export growth was not an important factor for economic growth in Asian and African countries.

Other studies have found that export growth increases the inflows of investment in those sectors where the country has comparative advantage and this could lead to the adoption of advanced technologies, increasing the national production and the rate of economic growth. As demonstrated by Gylfason (1998), an increase in exports can cause a vast expansion of imports of services and capital goods, which are essential to

improving productivity, while the increasing inflows of technology have considerable effects on economic growth. Also, Rodrik (1997) notes that the rate of economic growth is affected by the rate of exports, because of the increase in investments in export-oriented firms and in those that cover the increasing domestic demand.

2.5 Export Policy in Myanmar

Myanmar's export policy is to export all exportable surpluses and diversify foreign marketsby using natural and human resources. The activities of increasing and diversifying exportsand improving the quality of products have been attempted to increase the volume and valueof export. The following are the main components of Myanmar's export policy;

1. Export promotion is the main ingredient of Myanmar's external export policy,
2. The private sector is allowed to engage in external trade activities in accordancewith the rules and regulations relating to export.
3. Export first is required in the case of the private sector, however, accounts transferbetween different foreign currency accounts holder is also permitted.
4. The private exporters are allowed 100 percent export retention.
5. All commodities are allowed to be exported except certain restricted items likerice and rice products and other products which are prescribed to be solelyexportable by the state owned economic enterprises, with a view to maintaining internal food security.
6. All exports of the private sector including foreign traders and state enterprises aresubject to licensing.

Normally, registered exporters/importers have the right to export all commodities, except riceand rice products and other products which are prescribed to be solely exportable by theState-Owned Economic Enterprises (Min Maung Oo, 2013).

2.6 Review on Previous Studies

Edwin Emmanuel Ukama (2012), studied the relationship between export performance and global economic performance during 2002-2012. He developed

empirical tools to quantify the relationshipbetween a country's level of exports and the GDP of the recipient country by using the quantitative method. He found that a country or firm's destiny in terms of export performance can still be influenced significantly by factors within its control, even if there is a strong relationship between its exports and the GDP of the country it is exporting to.

Athanasia Stylianou Kalaitzi (2015), examined the causal relationship between exports and economic growth: time series analysis for UAE during 1975-2012. In his study, he describes (1) the nature of the link between merchandise exports and economic growth in UAE over the period 1975-2012 (2) the causal relationship between primary exports, manufactured exports and economic growth for the period 1981-2012 (3) the existence of a causal relationship between fuel-mining exports and economic growth for the period 1981-2012 (4) the existence of a causal relationship between diversified exports and economic growth for the period 1981-2012 by using empirical method. The finding of this study confirms that the ELG (export-led growth) hypothesis is valid for UAE in the short-run, highlighting the importance of export sector in the UAE economy. The suggesting concerning with the government of UAE should continue the successful export promotion policy, focusing on manufactured exports in order to accelerate economic growth in UAE.

Michiel van Dijk (2002), investigated the determinants of export performance in developing countries: the case of Indonesian manufacturing during 1998-2000. This study tries to contribute to the understanding of export behavior firms in developing countries by using the descriptive method. The author suggests that the relationship between relative size, the square of relative size, foreign ownership and age and export propensity is similar across industries. The outcomes suggest that the firm size-export relationship is inverted u-shaped. Economies of scale helps firms enter foreign markets but only up to a certain threshold point.

Brandon James Sheridan (2012), examined three essays concerning the relationship between exports, macroeconomic policy, and economic growth. The first essay investigates the relationship between disaggregated exports and growth to address why many developing countries rely on primary goods as their main source of export

income when evidence suggests they could earn higher returns by exporting manufactured goods. Thesecond essay explores the impact of fiscal episodes on the extensive and intensive margins of exports for a sample of OECD countries. The third essay takes a broad perspective in characterizing the relationship between disaggregated exports, macroeconomic policy, and economic growth. The author used empirically test and simultaneous equations methods. The author suggests that some evidence in favor of macroeconomic policy may affect the level of exports. Moreover, exports appear to exert an influence on growth, but the role of macroeconomic policy inthe growth process seems to be only through its influence on other variables.

Aye Marlar Thwin (2013), studied development of fisheries sector in Myanmar during 2001-2011. This thesis is aimed to study the Institute of fisheries sector, inputs requirements, production, export and consumption situation of fisheries sector in Myanmar by using descriptive method. She discovered that the development of fishery sector for foods security needs to be sought better ways to maintain valuable resources. The fishery exporting enterprises also needs to care about the promotional activities to entice new customers. To take bargaining power of buyers, the private enterprises need to attract new customers, not only from ASEAN countries but also from other regions of the globe.

Chapter (3)

An Overview of Fishery Industry in Myanmar

3.1 Historical Background of Fishery Sector

Myanmar is the largest country in mainland South-East Asia, comprising a land area over 261,228 square miles. Myanmar has a richness of freshwater and brackish water fisheries to the extensive big river network system in the delta region. Therefore, Myanmar has a favorable condition that enables to breed and produce fish and prawn (Khin Maung Soe, 2008).

The fishery sector in Myanmar, comprising the freshwater fishery, marine capture fishery and aquaculture plays a very important role in the economy of the country and provides an important source of food security for the people of Myanmar.

In the colonial period, the first Myanmar Fishery Act was enacted in 1875. The purpose on this Act was to raise revenue from the fishery sector. Later, reforms were advocated by fisheries researchers and revenue officers. The Act was reformed based on three views that are conservation of fishery resources, preventing the deterioration of fishery by silting and modifying inter-relations of fishery lessees. And then, the new Burma Fisheries Act was set in 1905 (San Win Naing, 2015).

Under the colonial administration, the government's interest in fisheries was only for revenue consideration to help their administration. On the other hand, little was done to develop the fishery sector. At the end of the colonial period, the prices of fishery products were high and relied upon to fulfill the required consumption. The government institution for the fishery sector was set up in 1948 as Fisheries Bureau under Agriculture and Rural Development Corporation (ARDC). In 1961 Burma Economic Development Corporation (BEDC) was formed to control the price and to carry out fishing, culturing, importing and distribution (Aye Marlar Thwin, 2013).

During the period of Revolutionary Council, the government realized that fisheries sector was important in food security. Burma Fishery Limited was replaced

by People's Pearl and Fishery Corporation in 1963. Myanmar has started its fishery export in 1972. After the establishment of the socialist government in 1962, the effort to establish commercial marine fishery began. The People's Pearl and Fisheries Board was established to promote of marine fisheries. In the socialist economic policy, the PPFC was the only company that could engage commercial fisheries and exports. PPFC's fast food stalls (Yamonar)in the main market places sold several sea food recipes and invited consumer interests in sea food. Since then, sea food becomes popular in Myanmar (Khin Maung Soe, 2008).

In 1973/74 the socialist government formulated the long term twenty years plan. In order to uplift the country's economy, the plan aimed to fully utilize production resources and to promote export. The fisheries sector benefited to increase its fishing capacity and cold storage infrastructure thanks to foreign aids and loans. The main contributors were the Food and Agriculture Organization of the United Nations(FAO), Oversea Development Assistance of the United Kingdom(ODA_UK), Japan International Cooperation Agencies(JICA), Oversea Fisheries Cooperation Foundation of Japan(OFCF), and Asian Development Banks (ADB) (San Win Naing, 2015).

In the early 1994/95, Myanmar Fishery Enterprise was abolished and all fishery activities were delegated to the private sector. The process of privatization has pushed the fishery sector to develop with a momentum. The infrastructures, such as fishing vessels, ice plants, cold storage were sold or leased to private enterprises (Ni Lar Myint Htoo, 2011).

The Myanmar Livestock and Fisheries Development Bank were established in 1996 to provide financial support to private entrepreneurs in fishing sector. The culture system was also modified and aquaculture grew significantly. Today fishery products not only take care of the country's consumption but also for exports (Aye Marlar Thwin, 2013).

3.2 Institutions of Myanmar Fishery Sector

For policy making, the Ministry of Livestock, Fisheries and Rural Development (MLFRD) is the main government institution under which the Department of Fisheries (DOF), Myanmar Fisheries Federation (MFF), Myanmar Livestock and Fisheries Development Bank are implementing bodies for fishery sector projects.

3.2.1 Department of Fisheries (DOF)

The Department of fisheries under the Ministry of Agriculture, Livestock and Irrigation is the main government institution which is responsible for fishery sector development. The Department of Fisheries undertake all round fisheries development and extend management to commercial fisheries activities including exports. The head office dedicates fisheries administrations to the provincial offices in Regions and States. The level of administration is down to the township level fisheries offices (Aye Marlar Thwin, 2013).

The DOF is responsible for the development of fishery sector of the Union of Myanmar and the responsibilities of DOF for development and management in fishery are as follow;

(1) Conservation and rehabilitation of fishery resources
(2) Promotion of fisheries researches and surveys
(3) Collection and compilation of fishery statistics and information
(4) Extension services
(5) Supervision of fishery sectors
(6) Sustainability of fishery resources

Since 1988, Myanmar economic system has changed to open market economy. The DOF changed its rules and regulations according to the market economy to catch up regional and global markets. And theDOF is one of the productive sectors and it holds vast potential for further expansion and export for the products (Department of Fisheries, Fishery Statistics 2017).

The DOF is responsible for managing all fishery activities, tacking action when necessary in accordance with the laws and collect revenues. Revenues are collected from fishing, marketing, culturing and exporting. Fishery income makes a considerable contribution to State revenue. The kinds of fishery revenues are tender fees, license fees, registration fees, inspection fees, fees payable for fishing gear and implements and fishing vessels, fresh fish duties, export duties, fines and other duties. Department of fisheries is implementing the fish price survey in Yangon every year (Soe Win Naing, 2013).

All of its tasks are then shared among the relevant management line. The administration structure of the Department has following four divisions are fisheries supervision and revenue, aquaculture, research and development and administration and finance (Tun Naing, 2014).

Under the management of Yangon Region Department of Fisheries, the section for research and development has organized with The "Institute of Fisheries Technology" and "Marine Fisheries Research". The regular training courses on aquaculture, aquatic animal disease control, fisheries and quality control and fisheries inspections are conducted year round (Aye Marlar Thwin, 2013).

In Myanmar, the Central Statistical Organization (CSO) is the only authority to undertake national level statistical data collection, processing and compiling. In the case of fisheries statistics, Department of Fisheries is responsible in data collection, processing and dissemination. All of these activities in the department are undertake by the "fisheries planning and statistic section".

3.2.2 Myanmar Fishery Federation (MFF)

Myanmar Fishery Technicians Association (MFTA) was first formed in 1989. In 1994, it was reconstituted and renamed as Myanmar Fisheries Association (MFA). Myanmar Fisheries Association (MFA) was reformed again as Myanmar Fisheries Federations (MFF) on December 1, 1998. Moreover, Myanmar Fisheries Federation was constituted as a member of ASEAN Fisheries Federation in 2002 (Soe Win Naing, 2013).

Myanmar Fisheries Federation (MFF) is one of the highest NGOs commercial organizations to encourage and promote fishery industries of Myanmar. The main objective of MFF is to develop the fishery industries while this association also performs as a medium between the government and the private sectors. There are also other associations under MFF. These associations are associated with MFF and participate to contribute to the fishery sector development. Some of the associations under MFF are as follows;

(1) Myanmar Shrimp Association
(2) Myanmar Fish Farmers Association
(3) Myanmar Fishery Products Processors and Exporters Association
(4) Myanmar Aqua-Feed Association
(5) Myanmar Marine Fisheries Association
(6) Myanmar Freshwater Capture Fisheries Association
(7) Crab Entrepreneurs Association
(8) Eel Entrepreneurs Association
(9) Ornamental Fish Entrepreneurs Association (San Win Naing, 2015).

Department of Fisheries (DOF) and Myanmar Fisheries Federation (MFF) are like twins under the Ministry of Agriculture, Livestock and Irrigation. In order to better manage the fishery sector, DOF and MFF has teamed up to work together to achieve common goal. In order to exchange views and to know the up-date information of the livestock and fishery sector, the regular weekly meetings are held at the conference hall in the MFF every week since June 6, 2005 for the development of Myanmar Fisheries. MFF has actively cooperated with DOF and supported it in many ways. The functions of MFF are as follows;

(1) MFF is able to support application made by its members to Department of Fisheries to undertake fisheries and aquaculture activities.

(2) MFF also can recommend application to the Livestock and Fisheries Bank for loan application.

(3) MFF has a good support from the government and negotiate directly for members' benefits.

(4) MFF also helps with negotiation of selling and harvesting of fish, shrimp and working collectively.

There are many members with small property. The member ship fee is 300 kyat's per year and kyat's 5000 for life.MFF was founded in 1989 as one of the highest national level non-profit making organization with a view to encourage and promote the fishery industries of Myanmar (Ni Lar Myint Htoo, 2011).

3.2.3 Myanmar Livestock and Fisheries Development Bank

The Myanmar Livestock and Fisheries Development Bank (MLFDB) were established in 1996, to provide financial supports to private entrepreneurs in fishery sector as semi-government institution. The bank has provided farmers who actually require financial investment for the expansion of fisheries-related businesses. Myanmar Livestock and Fisheries Development Bank (MLFDB) have head office in Yangon and is running with nine branches offices. Depending upon the requests received and the recommendations of the Department of Fisheries, the board of directors may approve loans of up to 50,000 Kyats per acre of fish pond. The bank will also change its name to Myanmar Yadana Bank officially on June 25.

3.3 Policies, Plans and Laws of Fisheries

National Policy on Fishery Sector is as follows;

(1) To promote all round development in the fisheries sector

(2) To increase fish production for domestic consumption and share the surplus with neighboring country

(3) To encourage the expansion of marine and freshwater aquaculture

(4) To upgrade the socioeconomic status of fisheries communities.

The ministry of livestock of fisheries is responsible overall for the fish and meat sectors. The national policies of policies of ministry of livestock and fisheries are as follows;

(1) To boost distribution of quality fish and animal strains

(2) To strive for all round development of fish and meat production sector

(3) To exceed the fish and meat for the domestic consumption and to export the surplus for export earning foreign exchange

(4) To make arrangements to increase investment in the fishery and livestock sector

(5) To further development prawn breeding

(6) To protect and conserve the fishery resources both in freshwater fishery and marine fishery

(7) To boost freshwater fish production to meet local demand and to strive with might and main for development of fishery resources

(8) To improve the socio-economic standard of farmers raising and production livestock, fish and prawn under the leadership of the government

In the national level, the fishery development plans from 2010-2011 to 2011-2012 are as follows;

(1) Planning for supporting to expansion of coastal aquaculture

(2) Expansion of rice-fish culture program for development of rural areas

(3) Mud crab culture development plan

(4) Implementation of genetic improvement in Rohu(Leabeorohita)

(5) Pilot farming projects of sea weed (Eucheumacottonii) in coastal area

(6) Planning for public awareness for conservation of fishery resources

Myanmar fisheries sector started with the "Fisheries Act 1905" and it was subsequently amended in 1954. After that, it was replaced with the following laws:

(1) Law relating to the fishing rights of foreign fishing vessels (1989)

(2) Aquaculture fisheries law (1989)

(3) Myanmar marine fisheries law (1990)

(4) Fresh water fisheries law (1991)

(5) Law amending the Myanmar marine fisheries law

(6) Law amending the law relating to fishing rights of foreign fishing vessels (Department of Fisheries, 1993).

3.4 Changes in Per Capita Fish Consumption

World population is increasing, population of Myanmar is also increasing. According to world population statistic, it is estimated, as estimation world population will be 10 billion in 2050. The people of Myanmar like fish and fishery products which are essential of daily meals of them, fish sauce and fish and shrimp paste are the favorite dishes of Myanmar. Fish constitute a major source for animal protein in the diet of Myanmar people.

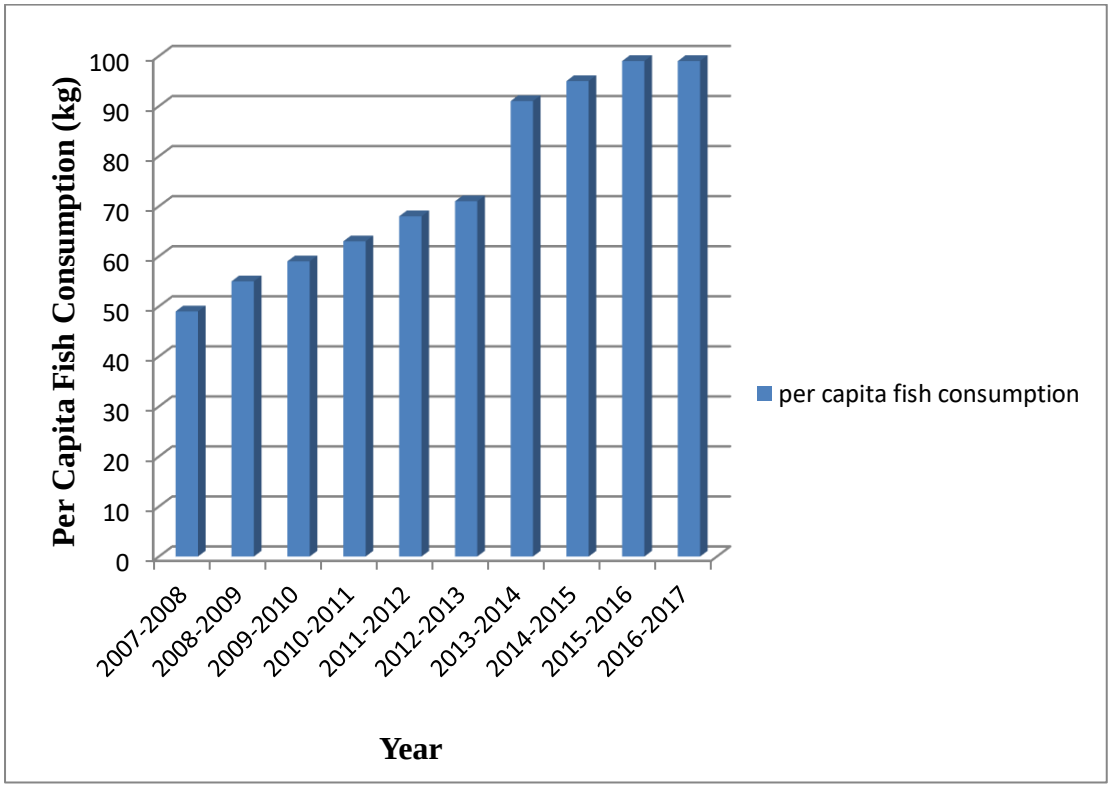
Major foods for Myanmar population are rice, fish and vegetables. Fishery products are the main food in the daily diet of Myanmar people and fishery products effect on human health. Thus, Fishery sector is standing as an important source of food and nutrition in Myanmar. A simple calculation of the ratio between the existing population and fisheries export has been assumed as per capita consumption of fish in the country. Actually, fisheries products are important for Myanmar people as a main source of animal protein. Fish for consumption in Myanmar at approximately 3,193,920 tons and suggesting a per capita consumption of fish 49 kg in 2007/2008. The relationship of population, fishery production and per capita consumption of fish is shown in table (3.1).

Table (3.1) Per Capita Fish Consumption (From 2007/2008 to 2016/2017)

No.	Year	Production (metric ton)	Export (metric ton)	Population (million)	Per Capita Fish Consumption (kg)	Changes in Per Capita Fish Consumption
1	2007/2008	3,193,920	351,652	57.50	49	11.36
2	2008/2009	3,542,190	324,710	58.38	55	12.24
3	2009/2010	3,921,970	375,092	59.13	59	7.27
4	2010/2011	4,163,460	373,892	59.78	63	6.78
5	2011/2012	4,478,350	386,981	60	68	7.49
6	2012/2013	4,716,220	376,845	61	71	4.41
7	2013/2014	5,047,400	345,267	51.48	91	28.17
8	2014/2015	5,316,950	338,290	51.99	95	4.40
9	2015/2016	5,591,830	368,970	52.45	98	3.15
10	2016/2017	5,675,470	438,706	52.92	99	1.02

Source: Department of Fisheries, Fishery Statistics

Figure (3.1) Per Capita Fish Consumption (From 2007/2008 to 2016/2017)



Source: Data from Table (3.1)

According to table (3.1), production, population and per capita consumption are relative each other. It is essential to maintain the per capita consumption as high as possible by increasing fish production. During the study period from 2007/2008 to 2016/2017, per capita consumption is from 49 kg to 99 kg. Per capita consumption increased due to the expansion of inland and marine water fisheries in Myanmar.

According to table (3.1), the production of fishery products is increasing enoughto support for the consumption of population. The production can be made enough for the increasing population, the economy of the country will continue operate to the expansion trend. According to table, the production of fishery products can provide not only for domestic consumption but also for export. FAO also recommended that fish had become an increasingly important source of protein over the last decade in most of the Asian countries. Fishery products are available within Myanmar sufficiently and easily at reasonable prices. National per capita consumption of fishery products has increased every year. Therefore, production of fishery products will take the country economy to the expansion trend.

3.5 Production of Marine Fishery

Myanmar has a long shoreline along the Bay of Bengal and the Andaman Sea as well as with various river systems and coastal seas. The complex ecosystems along the coastal areas are important for to develop further. The mangroves, coral reefs, sea grass, sand beach and mud flats are creating habitats and grounds for spawning, nursing of several aquatic animals. Owing to the extensive mangrove areas, Myanmar is ranked the fourth position among the largest mangrove prevalence Asian countries. The distribution of mangroves are in Myanmar considered of Rakhine State with 64,752 areas (ha), Ayeyawady Division with 177,147 areas (ha) and Tanintharyi Division with 140,024 areas (ha). Ayeyawady Division possesses 46.4% of total mangrove area and the largest of mangrove area in Myanmar.

Myanmar endowed with huge fisheries potential marine water in which fishing zones are allocated. The territorial fishing zone is within 12 nautical miles offshore from the baseline and the EEZ covers 200 nautical miles offshore from the base line. The total marine fisheries areas in Myanmar exclusive economic zone is about 486,000 square kilometers (Department of Fisheries, Fishery Statistics 2017).

Marine fisheries resources have played an important role as a source of food, income and employment. In the beginning, marine fisheries was composed of onshore

fisheries, inshore fisheries and offshore fisheries. After the promulgation of the 1990 Marine Fisheries Law, onshore and inshore fishery was combined into inshore (coastal) fisheries.

The inshore fishing is ranged to operate within 5 to 10 nautical miles of the shore. In this area, the fishing boat which is built by traditional type with not more than 30 feet long or using less than 25 Horse Engine Power (HPE). The fishing gears for using are driftnet, gillnet and long line. Inshore fisheries have always been the main focus of Myanmar's fishing activities. Inshore fisheries actually are of small scales but as a matter of fact, it supply several a little of several high value species (lobsters, shrimp, grouper, mud crab, clams, etc) (Department of Fisheries, Fishery Statistics 2017).

In the offshore fisheries, the offshore fishing vessels operate beyond from outer limit of the inshore fishing zone to the Exclusive Economic Zone (EEZ). The fishing vessels are more than 30 feet long or using more than 25 Horse Engine Power (HPE) operating in offshore area. In this area, the commercial fishing gears are trawl net, purse seine, and long line. There are approximately 770 fish species identified in Myanmar. Among these, 470 species are of marine fishes. Among the whole fisheries sector in Myanmar, marine fishery is most important. Therefore, the production of marine fishery during 10 years period from (2007/2008) to (2016/2017) is expressed in table (3.2).

Table (3.2) Production of Marine Fisheries (2007/2008)-(2016/2017)

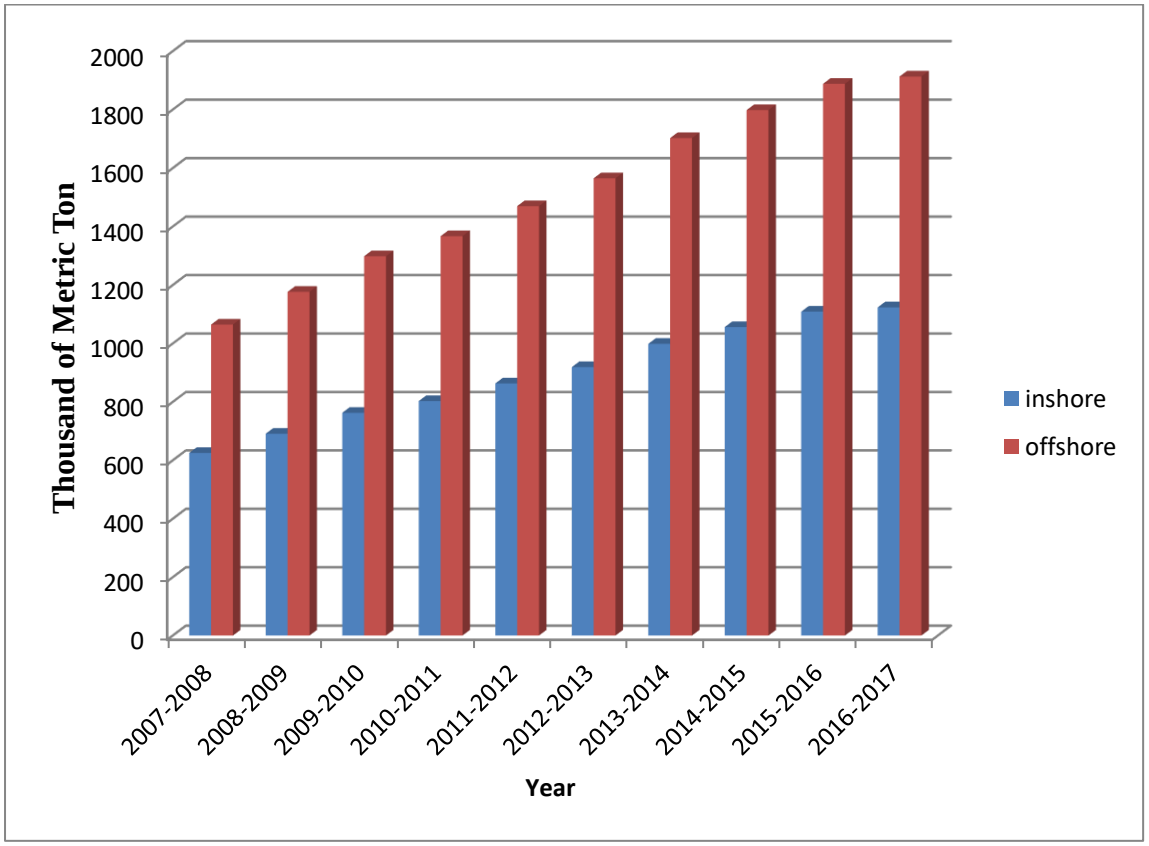
(Metric Ton, Thousand)

No.	Year	Inshore Fishery		Offshore Fishery		Total
		Amount	%	Amount	%	
1	2007/2008	625.21	37%	1064.55	63%	1689.76
2	2008/2009	690.98	37%	1176.53	63%	1867.51
3	2009/2010	762.49	37%	1298.29	63%	2060.780
4	2010/2011	802.83	37%	1366.99	63%	2169.82
5	2011/2012	863.15	37%	1469.69	63%	2332.84
6	2012/2013	919.03	37%	1564.84	63%	2483.87
7	2013/2014	999.83	37%	1702.42	63%	2702.25
8	2014/2015	1056.05	37%	1798.15	63%	2854.20
9	2015/2016	1108.79	37%	1887.95	63%	2996.74
10	2016/2017	1123.48	37%	1912.95	63%	3036.42

Source; Department of Fisheries, Fishery Statistics

Figure (3.2) Production of Marine Fisheries (2007/2008)-(2016/2017)

(Metric Ton, Thousand)



Source; Data from Table (3.2)

Table (3.2) shows that production of marine fisheries (2007/2008) - (2016/2017). Figure (3.2) shows that the production of marine fisheries (2007/2008) – (2016/2017). They were calculated by thousand metric tons for each year. In figure,thousand of metric tons show on the vertical axis and each yearly show on the horizontal axis.

In 2007/2008, inshore fisheries production was 625.21 MT. Offshore fisheries production was 1064.55 MT. Thus, total marine fisheries production was 1689.76 MT. In 2012/2013, inshore fisheries production was 919.032 MT. Offshore fisheries production was 1564.84 MT. Thus, total marine fisheries production was 2483.87 MT. In 2016/2017, inshore fisheries production was 1123.48 MT. Offshore fisheries production was 1912.945 MT. Thus, total marine fisheries production was 3036.42 MT. Offshore fisheries production was maximum amounts of thousand metric tons than inshore fisheries because Myanmar owns impressive marine water and its fish species are more than inshore fisheries.

During the study period from 2007/2008 to 2016/2017, the participation of inshore fisheries in total marine water fisheries production is 37% in 2007/2008 and 37% in 2016/2017. The participation rate of offshore fisheries is greater than inshore fisheries because Myanmar has a lot of river and sea.

The production of marine fisheries is increasing according to Myanmar Marine Fishery Law 1990, Law amending the Myanmar Marine Fisheries Law and Law amending the law relating to the fishing rights of foreign fishing vessels in 1993. Moreover, Government allowed to sell and lease infrastructure of Fishery sector (such as fishing vessels, ice plants, processing plants and fish meal plants) to the private owners of fishery enterprises.

3.6 Production of Freshwater Fishery

Myanmar has impressive inland water capture fisheries. Freshwater fisheries are mainly situated on the reverie system of the country. The freshwater fisheries (inland fisheries) are mainly provided to the people of Myanmar for food security, as well as for getting the opportunity of employment in fishery communities from rural areas. Myanmar people mainly consumed varieties of fish from freshwater such as natural inns, lakes, streams and rivers.

The inland waters are made up mainly of the Ayeyarwaddy (2150 kilometers long), Chindwin (844 kilometers long), and Sittaung (563 kilometers long) rivers, and the large ThanlwinRiver(2400 kilometers) in the east. These rivers flow from north to south into the sea such as eastern part of Bay of Bengal, Gulf of Mottama and the Andaman Sea and a huge network of river systems in the Ayeyarwaddy Delta (Ni Lar Myint Htoo, 2011).

Freshwater water fishery was carried out in accordance with the following objectives:

(1) To further develop the fisheries;

(2) To prevent the extinction of fish;

(3) To safeguard and prevent the destruction of freshwater fisheries water;

(4) To obtain duties and fees payable to the state;

(5) To manage the fisheries and to take action in accordance with the law.

Freshwater fisheries play an important role in supplying freshwater fish, which are most esteemed in the country. Inland fisheries are worked by three categories: the leasable fisheries, open fisheries and aquaculture fisheries. A total of 3714 leasable

fishery areas have been designated. Open fisheries consist of all kind of fishing in streams, lakes and reservoir and in the rice fields etc. Since 1995, fishing in reservoir was banned. Thus the landing from the reservoir is not included in fishery statistics. In 2017, the total leasable fishery was estimated at 340,000 tons while the production of the open fishery is estimated at 1,250,000 tons.

Freshwater fish producers can be divided into small-scale producers that cater mainly to the local market and large-scale producers that cater mostly to the export markets. Small scale producers contribute indirectly through creating employment and foreign exchange earnings. The most important export market for freshwater fish is the fast developing interregional market in Southeast Asia. The production of inland fishery which is most important food not only for domestic consumption but also a portion of country's economy with the export earning is presented in Table (3.3).

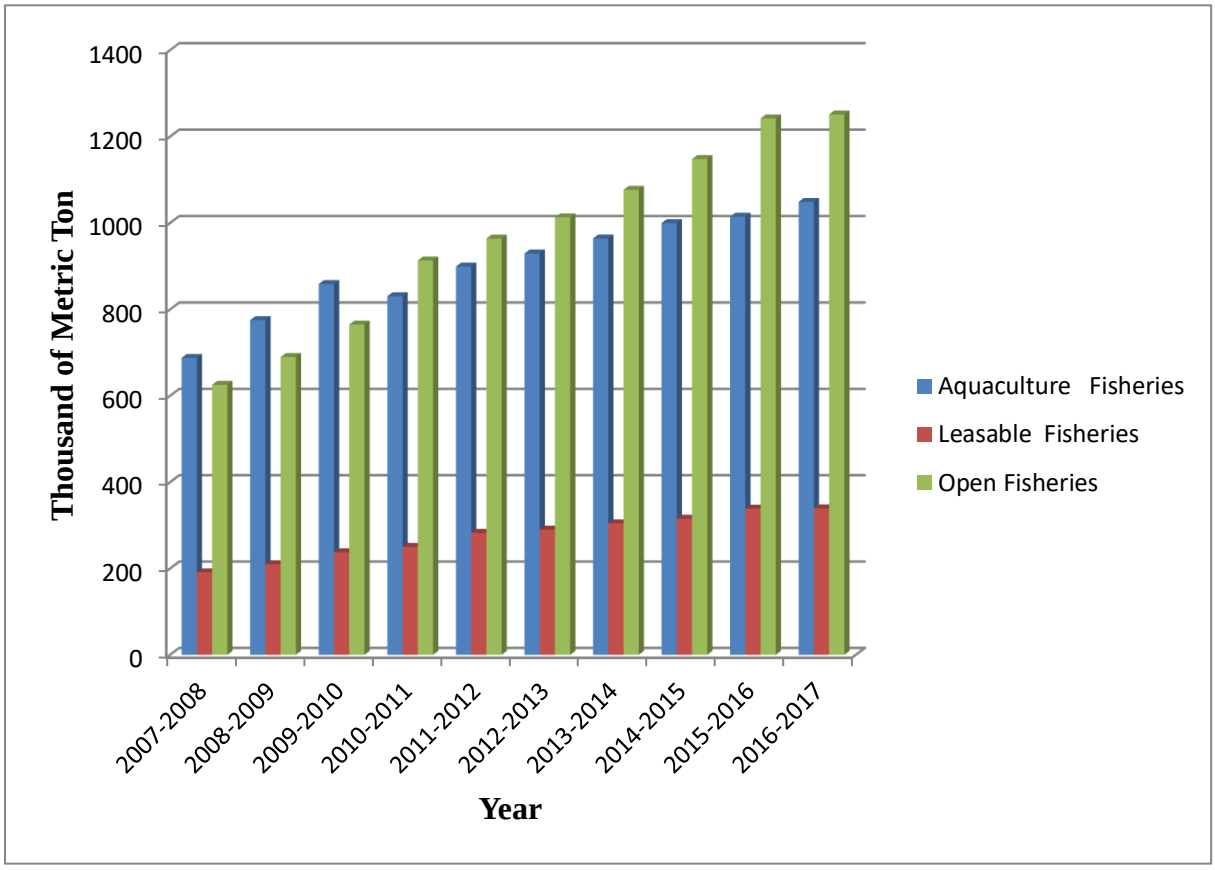
Table (3.3) Inland Fishery Production in Myanmar (2007/2008)-(2016/2017)

(Metric Ton, Thousand)

No.	Year	Aquaculture Fisheries	Leasable Fisheries	Open Fisheries	Total Inland Fisheries
1	2007/2008	687.67	191.05	625.44	1504.16
2	2008/2009	775.25	209.72	689.71	1674.68
3	2009/2010	858.76	237.46	764.97	1861.19
4	2010/2011	830.48	250.04	913.12	1993.64
5	2011/2012	899.05	282.64	963.82	2145.51
6	2012/2013	929.38	290.00	1012.97	2232.35
7	2013/2014	964.12	304.44	1076.59	2345.15
8	2014/2015	999.63	315.36	1147.76	2462.75
9	2015/2016	1014.42	338.69	1241.98	2595.09
10	2016/2017	1048.69	339.23	1251.13	2639.05

Source**:** Department of Fisheries, Fishery Statistics

Figure (3.3) Inland Fisheries Production in Myanmar (Metric Ton, Thousand)



Source; Data from Table (3.3)

Table (3.3) shows that production of freshwater fisheries (2007/2008)-(2016/2017). Figure (3.3) shows that production of freshwater fisheries (2007/2008)-(2016/2017). They were calculated by thousands metric tons for each year. In figure, thousand of metric tons show on the vertical axis and each yearly on the horizontal axis.

In 2007/2008, aquaculture fisheries production was 687.67 MT. Leasable fisheries production was 191.05MT. Open fisheries production was 625.44 MT. Thus, total freshwater fisheries production was 1504.16 MT. Among them, aquaculture fisheries production was maximum amounts of thousand metric tons than other kinds of fisheries.

In 2011/2012, aquaculture fisheries production was 899.05 MT. Leasable fisheries production was 282.64 MT. Open fisheries production was 963.82 MT. Thus, total freshwater fisheries production was 2145.51 MT. Among them, open fisheries production was maximum amounts of thousand metric tons than other kinds of fisheries.

In 2016/2017, aquaculture fisheries production was 1048.68 MT. Leasable fisheries production was 339.23 MT. open fisheries production was 1251. 13MT.

Among them open fisheries production was maximum amounts of thousand metric tons than other kinds of fisheries.

During the study period from 2007/2008 to 2016/2017, the participation of aquaculture fisheries in total freshwaterfisheries production is 46% in 2007/2008 and 40% in 2016/2017. The participation of leasable fisheries in total freshwater fisheries production is 13% in 2007-2008 and 13% in 2016/2017. The participation of open fisheries in total freshwater fisheries production is 42% in 2007/2008 and 47% in 2016/2017. Thus, the fishery sector could produce increasingly the amount of inland fishery products in every year during the period of from 2007 to 2017. During the period from 2007 to 2009, the production of aquaculture fishery became to be more than open and leasable fisheries. However, the production of aquaculture fishery became to be less than open fishery production from 2010/2011 until 2016/2017.

3.6.1 Leasable Fisheries (Inn Fisheries)

Leasable fisheries; also known as Inn, the fishing rights are granted through a lease arrangement with the DOF subject to stipulations relating to the area, species, fishing implements, fishing period and method etc. Myanmar people consumed freshwater fisheries mostly and freshwater fishes were mainly produced from inn, natural lakes and ponds.

Thereare exclusively key fishing grounds on floodplains which are primarily fished through the erection of barrage fences around the lease area with fish collected in various collections by means pens or traps. The peak season involves capturing fish migration off the floodplain at the beginning of river draw-down. Lease holders enjoy exclusive rights to fish the lease area including preventing access by others and a certain degree of environmental management and control.

Department of fisheries has been conducting the auction for leasable fisheries annually and DOF has collected the revenue 8205.706 million kyat in 2016/2017 fiscal years. There are currently 3299 leasable fishery in Myanmar of which 3299 still exploitable of these and the relationship between number of leasable fishery and its available production is shown in the Table (3.4).

Table (3.4) The Relationship between Number of Leasable Fishery and its Production

No.	Year	Total number of Leasable Fishery (number)	Production of Leasable Fishery (MT-000)	Average Production
1	2007/2008	3460	191.05	0.055
2	2008/2009	3453	209.72	0.060
3	2009/2010	3451	237.46	0.068
4	2010/2011	3458	250.04	0.072
5	2011/2012	3415	282.64	0.082
6	2012/2013	3409	290.00	0.085
7	2013/2014	3290	304.44	0.092
8	2014/2015	3304	315.36	0.095
9	2015/2016	3312	338.69	0.102
10	2016/2017	3299	339.23	0.103

Source: Department of Fishery, Fishery Statistics

Table (3.4) shows the relationship between the number of leasable fishery and its fishery production. According to table (3.4), although the number of leasable fishery was in fluctuation, the production of leasable fishery was in increasing annually. In 2007/2008, the number of leasable fishery was decreased to 3460, 3453 in 2008/2009 and 3451 in 2009/2010 because of converting the same of leasable fishery into agriculture. Although the number of leasable fishery decreased in 2007/2008,

2008/2009 and 2009/2010, its production increased to 191.05 thousands of metric tons in 2007/2008, 209.72 thousands of metric tons in 2008/2009 and 237.46 thousands of metric tons in 2009/2010 respectively. Average production (output in per number of leasable fishery) also increased in every year. Since average production is increasing steadily, leasable fishery production of Myanmar will lead to more production even if number of leasable fishery decreased.

3.6.2 Open Fisheries

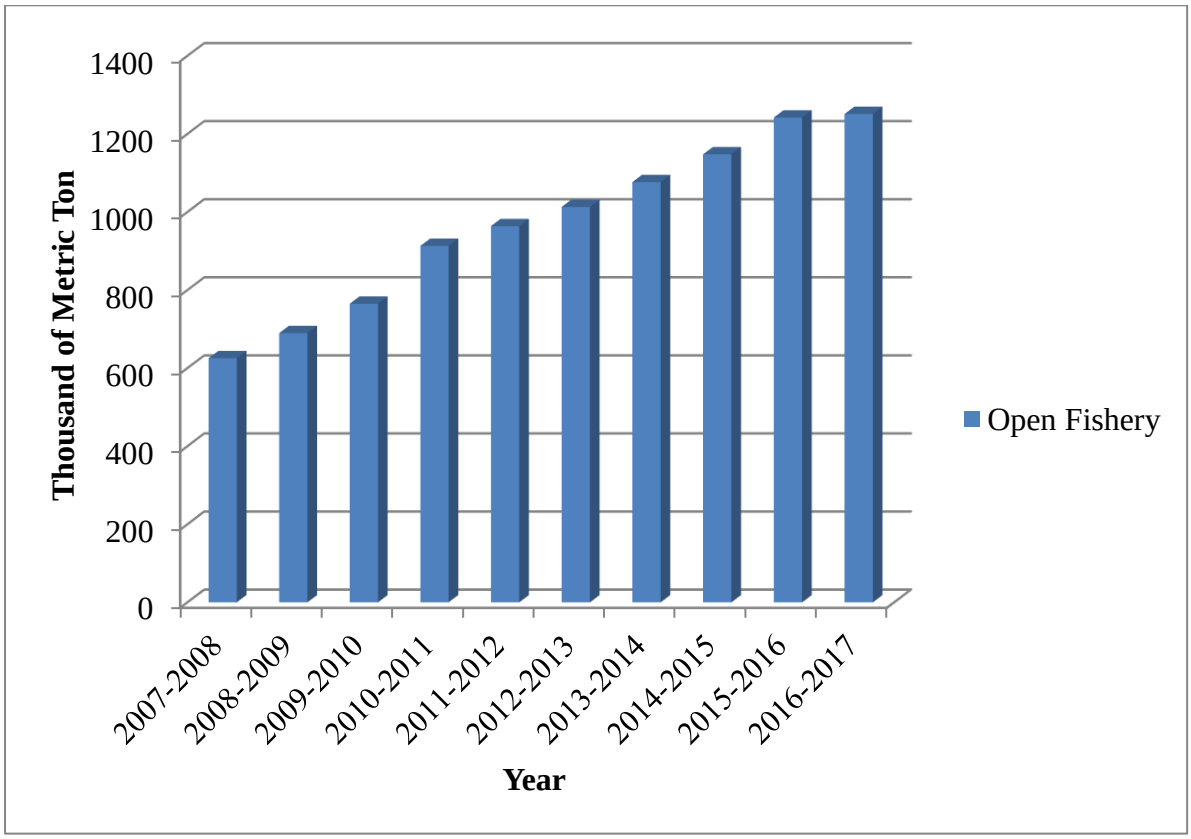
These are fisheries in all other areas including all types of fishing operation. The right to fish in these areas is licensed out by DOF. All fishing gears require a licensed out by DOF. Use of all fishing gears require a license from DOF, however in practical term it is difficult to collect license from all the small gear holders. There is widespread fishing activities in water bodies, streams, lakes, reservoirs and rice fields. For most this is a set free, called the open fisheries. Some of the larger gear set in rivers are allocated by a tender system (tender fisheries). License fees for small-gear are low. The entire fishing is closed during June, July and August to allow spawning enforced only for the "inn" fishery (leasable fishery), tender fisheries and larger gears. Small-scale fishery operates year-round although it is considered technically "illegal" during this month. Yangon division, Ayeyarwaddy division, Bago division and Mon state are the main areas for the open fishery production. Open fisheries are very important for rural population, particularly landless because its needs low investment in comparison with other kinds of fishing activities. The production of open fishery and its share in total freshwater fishery and in total fishery production is shown in Table (3.5).

Table (3.5) Open fisheries production (Thousand of Metric Ton)

No.	Year	Open Fishery	Freshwater Fishery	Total Fishery Production	Share in Freshwater Fishery (%)	Share in Total Fishery Production
1	2007/2008	625.44	816.49	3193.92	76.637	19.582
2	2008/2009	689.71	894.43	3542.19	76.683	19.471
3	2009/2010	764.97	1002.43	3921.97	76.311	19.504
4	2010/2011	913.12	1163.16	4163.46	78.503	21.931
5	2011/2012	963.82	1246.46	4478.35	77.324	21.522
6	2012/2013	1012.97	1302.97	4716.22	77.743	21.478
7	2013/2014	1076.59	1381.03	5047.40	77.955	21.330
8	2014/2015	1147.76	1463.12	5316.95	78.446	21.587
9	2015/2016	1241.98	1580.67	5591.83	78.573	22.211
10	2016/2017	1251.13	1590.36	5675.47	78.669	22.045

Source; Department of Fisheries, Fishery Statistics

Figure (3.4) Open Fisheries Production (Thousand of Metric Ton)



Source; Data from Table (3.5)

Table (3.5) shows the production of open fishery and its share in total freshwater fishery and in total fishery production. Figure (3.4) shows that open fisheries production from (2007/2008) to (2016/2017). They were calculated by thousand metric tons for each year. According to table (3.5), the production of open fishery was in increasing annually. In 2007/2008, the production of open fishery was 625.44 thousand of metric tons, 689.71 thousand of metric tons in 2008/2009 and reached to 1251.13 thousand of metric tons in 2016/2017. Its share in total freshwater fishery was 76.64% in 2007/2008, 76.68% in 2008/2009 and increased to 78.67% in 2016/2017. Thus, opening fishing is the main part of freshwater fishery production.

3.6.3 Aquaculture fisheries

Aquaculture is not only an important source of food as the major part of total output from aquaculture been used for domestic consumption but also provides employment, important nutritional contribution to society and export. Aquaculture has also become a significant source of foreign currency for Myanmar, since the products exported are usually more valuable ones destined for markets in the developed world.

Aquaculture consists of freshwater culture, brackish water system and marine-culture and fingerling production.

Aquaculture has been the fastest growing sector for over a decade and it must be relied on also to sustain future fishery production enough to meet the demand of growing population. Because of the natural threat of global warming, environmental degradation of fishing grounds and over fishing for long term, there has been depletion of natural resources and with the annual rising of population food demand and supply gap worsen, to a ratio 2 to 1. Therefore, aquaculture has to be emphasized by all over the world.

In Myanmar, there were only 6300 acres of fish ponds in 1988. Aquaculture law No. 24/89 led to a substantial increase in the number of fish ponds in the country. The three-year fish culture plan (2000/2003) was prepared to accelerate the development of aquaculture sector. The first attempts of fish culture were made in 1954 with the exotic species like common crap, tilapiaand gourami. Freshwater aquaculture is well established in terms of seed production and grow out culture of more than 20 species and 442702 acres for aquaculture were established. Due to increase in local demand and potentials in export markets, most of investment in fisherysector are inflowing into the aquaculture.

Table (3.6) TotalAquaculture Pond and Production

No.	Year	Area of Aquaculture pond (Acre)	Production of Aquaculture Pond (MT-000)	Productivity of per Acre (MT)
1	2007/2008	441098	687.67	15.589
2	2008/2009	440585	775.25	17.595
3	2009/2010	442702	858.76	19.398
4	2010/2011	443695	830.48	18.717
5	2011/2012	448468	899.05	20.047
6	2012/2013	449692	929.38	20.667
7	2013/2014	450324	964.12	21.409
8	2014/2015	469153	999.63	21.307
9	2015/2016	478002	1014.42	21.222
10	2016/2017	487525	1048.69	21.51

Source: Department of Fishery, Fishery Statistics

According to Table (3.6), the area of aquaculture pond increased in every year, the production of aquaculture ponds increased annually. In 2007/2008, the 441098 acres of aquaculture pond could produce 687.67 thousands of metric ton with the production of 15 ton in per acre, the 440585 acres of aquaculture pond could produce 775.25 thousands of metric ton pond could produce 1048.69 thousands of metric ton with the production of 21 ton in per acre in 2016/2017. Thus the increase of per capitafish production are partly due to technology and partly expanding of agricultural pond area.

3.7 Contribution to GDP by Fishery Sector in Myanmar

Since Myanmar has transformed to Market Oriented Economy in 1988, the fishery sector is one of the most important sector to provide the national economy. Fishery sector to fulfill the protein requirement of the people of Myanmar and to provide the food security as well as to get the opportunity for the employment to a large number of fishery communities and rural people.

Table (3.7) Contributions to GDP by Sector in Myanmar (2007/2008 to 2015/2016)

Year	Agriculture	Livestock and Fishery	Processing and Manufacturing	Trade
2007/2008	54.1%	7.6%	14.9%	21.5%
2008/2009	55.1%	7.5%	16.0%	21.4%
2009/2010	53.1%	7.6%	17.3%	23.2%
2010/2011	52.1%	7.1%	18.6%	22.6%
2011/2012	52.3%	7.2%	19.2%	23.0%
2012/2013	52.1%	7.3%	19.6%	23.4%
2013/2014	48.7%	7.8%	20.7%	23.9%
2014/2015	49.0%	7.5%	21.1%	24.0%
2015/2016	48.3%	7.8%	21.5%	24.2%

Source; Department of Fishery, Fishery Statistics

In 1988/89 Myanmar Fishery Enterprise was abolished in 1994/95 and private enterprises were given permits to freely export fishery products. Myanmar Fishery Federation permits 560 national own private fishery companies.

In Nov 1988, the Foreign Investment Law was introduced along with the removal of restriction on private sector participation in domestic and foreign trade. After trade liberalization and law relating to the fishing rights of foreign fishing vessels in 1989 encouraged the development of foreign investment. Moreover, many joint ventures and foreign companies carried out fishing in deep sea area and fish culture due to foreign investment law.

Moreover, the state has reduced many restricted laws and regulation due to consumer demand and export requirement. Myanmar Fishery Federation performs the sales and leases of state-owned fishing vessels, ice plants and cold storages to private enterprises and some were practiced in the form of joint venture. Livestock and Fishery sector is the fourth contributor to GDP after agriculture, trade and processing and manufacturing sector.

Chapter (4)
The Role of Fisheries Exportation

4.1 Trade Policy

Trade policy is a government policy that directly influences the quantity of goods and services that a country imports or exports. Trade is an essential driver for economic prosperity of a country as well as engine of growth for developing and developed countries. It is also a vital element of Myanmar's economic growth. Myanmar has opened its economy after 1988 and its trade volume has increased year by year. Myanmar trades with many countries especially with bordering countries such as China, Thailand and ASEAN countries, particularly Singapore (Ni Lar Myint Htoo, 2011).

Since Myanmar has changed economic course from a centrally planned economy into a market oriented system, a series of structural reforms had been introduced and new legal policy instruments were enacted as paving way for market oriented economy. The government has recognized in the context of the market oriented economic system, the private sector as a prim-mover of the market mechanism and pays great attention for its development. All-out efforts are being made to encourage the active participation sectors in foreign trade and giving full sport in every angle as to cope with the international trading practices.

Since 1997, Myanmar has potential to benefit from its membership in ASEAN by participating not only in AFTA but also in all areas of ASEAN economic cooperation. Myanmar's participation in AFTA may complement the ASEAN trade and may lead to trade creation. Myanmar's integration into ASEAN is anticipated to bring significant benefits to its economy.

Myanmar is a member country to World Trade organization (WTO). The basic principle of export policy is to penetrate into the global market by using the existing natural and human resources and to produce value added products more than normal export items. The basic of import policy is priority import the capital goods, construction materials, other essential goods, hygiene materials for the well being of the people (San Win Naing, 2015).

In addition, the state is supporting products for export promotion and support the import substitute production. Myanmar's potential with regard to trade and

investment is tremendously enormous in the areas of investment, trading, training and development, services and manufacturing sectors. Trade liberalization improved domestic technology, production process will be more efficient, and productivity in fishery sector will rise. The demand for fish exports increased due to the trade liberalization. Therefore, accelerate trade liberalization is needed to promote economic growth in Myanmar.

4.2 Top Ten Species of Exported Fish and Fishery Products of Myanmar

Myanmar fishery export includes freshwater and marine fish, prawn and other fishery products. In Myanmar, about 646 fish and fisheries species were exported to seafood market. The Table (4.1) shows the volume top ten species of exported fish and fisheries product of Myanmar in (2012/2013),(2013/2014), (2014/2015) ,(2016/2017) fiscal years.

Table (4.1) Top Ten Species of Exported Fish and Fisheries Products of Myanmar

No.	2012/2013	2013/2014

	Species (Common Name)	Value (US$ Million)	Species (Common Name)	Value (US$ Million)
1	Rohu	87.562	Rohu	69.047
2	Live Eel	40.091	Live Eel	52.212
3	Tiger Prawn	38.584	Live Mud Crab	44.680
4	Live Crab	34.583	Hilsa	26.169
5	Hilsa	33.932	Pink	25.799
6	White Pomfret	32.133	Tiger	20.231
7	Pink	29.522	Ribbon Fish	16.214
8	Ribbon Fish	25.018	Dried Fish	13.466
9	Dried Fish	16.288	Soft Shell Crab	11.993
10	White Prawn	15.538	White Prawn	11.739

Source: Department of Fishery, Fishery Statistics.

No.	2014/2015		2016/2017	
	Species (Common name)	Value (US$ Million)	Species (Common Name)	Value (US$ Million)
1	Rohu	60.335	Rohu	54.672
2	Live Mud Crab	48.907	Live Mud Crab	45.595
3	Live Eel	26.103	Ribbon Fish	35.116
4	Pink	22.951	Fish Meal	33.730
5	Tiger	20.525	Hilsa	28.044
6	Hilsa	15.507	Live Eel	25.350
7	Ribbon Fish	14.972	Soft Shell Crab	25.073
8	Soft Shell Crab	14.708	Tiger	20.965
9	Fish Meal	12.804	Pink	19.822
10	White Prawn	11.508	Big Eye Croaker	18.978

Source: Department of Fisheries, Fishery Statistics.

Table (4.1) shows top ten species of exported fish and fisheries products of Myanmar (2012/2013), (2013/2014), (2014/2015) and (2016/2017). They were calculated by US$ million for each year. According to table (4.1), the above mentioned

species are the most popular species in Myanmar. Rohu was the most exported species than others in years. It is usually the first place in most years in top ten species of exported fish and fisheries products of Myanmar. But, Rohu US$ million were decreased than 2016/2017. White Prawn and Big Eye Croaker was less than exported species than other in years. They are usually the last place in most years in top ten species of exported fish and fisheries products of Myanmar. White Prawn US$ million were decreased than 2014/2015. The amount of Rohu export is the highest among the other fish because the Arabian countries prefer to eat it. Live Mud Crab was popular in total fishery exports.

4.3 Export of Fish and Fishery products of Myanmar

Myanmar is one of the top ten countries in terms of fish production in the world. Fisheries is one of the important sectors providing substantial contribution to economic development, people's well-being of and food security of not only Myanmar people but also global people as well. Myanmar is one of the sufficient countries for fish and fishery products in the domestic consumption for food security and share the surplus with neighboring and other countries to export for national income.

Growth of an economy is directly related to exports. Export is one of the essential economic sectors in Myanmar playing a significant role in the national economy. Apart from direct contribution to the growth of GDP, it is also a source of income, employment and foreign exchange earnings. Fishery exports to major countries from Myanmar were Thailand, China, Singapore and Malaysia. Myanmar adopted the market-oriented system in 1988. Stabilization and reform measures had been undertaken to be in line with the new economic system. Privatization of aquaculture, hatcheries, and ponds, processing plants, cold storages, trading and marketing system has been a major stimulating factor in fishery exports. Government has granted export rights to private sector starting from 1988.

Only after 1994, all the fishery activities were delegated to private sector and the processing plant, cold storage plant; ice plant and fishing vessels were leased or sold. Since then, the export of fish and fishery products increases year by year as production of fish and fishery products also increases. Fish and fishery products are not new export items for Myanmar. Myanmar fishery products are exported to the foreign markets by dividing three types of that are fish products, prawn products and other products. According to DOF records, about 646 species of fish were processed and

exported to seafood market. The following table (4.2) shows the fishery export from 2007/2008 to 2016/2017.

Table (4.2) Export of Fish and Fishery Products of Myanmar

(Quantity- Metric Ton)

No	Year	Fish	Prawns	Other	Total
1	2007/2008	245473.15	21061.30	85117.60	351652.05
2	2008/2009	234060.74	18382.10	72267.70	324710.54
3	2009/2010	277823.74	17439.31	79829.38	375092.43
4	2010/2011	273043.74	19142.91	81706.06	373892.71
5	2011/2012	283688.76	17995.03	85297.53	386981.32
6	2012/2013	266464.97	17267.93	93112.79	376845.69
7	2013/2014	237142.31	16508.97	91616.08	345267.36
8	2014/2015	225974.93	17527.33	94788.33	338290.59
9	2015/2016	246970.93	13673.49	108326.47	368970.89
10	2016/2017	290580.04	13082.46	135044.01	438706.51

Source: Department of Fisheries, Fishery Statistics

Table (4.2) shows that export of fish and fishery products (2007/2008)-(2016/2017). They were calculated by thousand metric tons for each year. In 2007/2008, fish was 245473.15 MT. Prawns were 21061.30 MT. Others were 85117.60 MT. Thus, total export of fish and fishery products were 351652.05 MT. In 2011/2012, fish was 283688.76 MT. Prawns were 17995.03 MT. Others were 85297.53 MT. Thus, total export of fish and fishery products were 386981.32 MT. In 2016/2017, fish was 2905580.04 MT. Prawns were 13082.46 MT. Others were 135044.01 MT. Thus, total

export of fish and fishery products were 438706.51 MT. According to table (4.4), fish exports exceed than prawn exports and other fishery export annually. Fish exports constitute a significant contribution to the total export earnings of fish and fishery.

Fishery export of Myanmar was 351,652 thousand metric tons in 2007/2008 but it dropped to 324,710 in 2008/2009. Myanmar made endeavors to attain 560 million dollars in its fishery exports in 2007/2008 but failed 480 million dollars in 2008/2009 due to the impact of 2008 May Strom, the global financial crisis and the flash surge of hard currency exchange rate.

Table (4.3) Fisheries Export by Type of Trade (2007/2008)-(2016/2017)

(MT- Thousand Metric Tons)

No.	Year	Normal Trade	Border Trade	Total Fishery Export (MT)
1	2007/2008	143575	208077	351652
2	2008/2009	163069	161144	324213
3	2009/2010	191349	183743	375092
4	2010/2011	288190	69402	357592
5	2011/2012	188045	198936	386981
6	2012/2013	176900	199945	376845
7	2013/2014	152546	192721	345267
8	2014/2015	145413	192877	338290
9	2015/2016	148563	220407	368970
10	2016/2017	142094	296612	438706

Source; Department of Fisheries, Fishery Statistics

Table (4.3) shows that the fisheries exports for normal trade and border trade (2007/2008)- (2016/2017). They were calculated by thousand metric tons. In 2007/2008, normal trade was 143,575MT. Border trade was 208,077 MT. Thus, total fishery export was 351,652 MT. Both them, border trade was maximum amounts of thousand metric tons than normal trade.

In 2011/2012, normal trade was 188,045 MT. Border trade was 198,936 MT. Thus, total fishery export was 386,981 MT. Both them, border trade was maximum amounts of thousand metric tons than normal trade.

In 2016/2017, normal trade was 142,094 MT. Border trade was 299,612 MT. Thus, total fishery export was 438,706 MT. Both them, border trade was maximum amounts of thousand metric tons than normal trade.

4.4 Seafood Exports Markets

The fishery economy of Myanmar is heavily dependent on global fish market and trade which by largely related to major importing countries such as Japan, China, United States and European Union. Previously US was an important export market for Myanmar. However, since 2004 US buyers could no longer do business with Myanmar as a result of trade sanctions. Before the trade sanctions were imposed, the United States purchased almost US$ 25 million of frozen shrimp and around US$ 3 million of frozen fish per year from Myanmar exporters. Seafood export to US only started again in 2012 but are still limited. After the US and Canada also imposed sanctions in 2008 and then stopped importing.

The EU already removed the Generalized System of Preferences (GSP) status of Myanmar in 1997 after accusations of forced labor by International Labor Organization (ILO). Even though the loss of GSP status affected the competitiveness of seafood products, some EU buyers continued to fisheries product from Myanmar. Despite the sanctions, the UK which is a member of EU continued to import about US$ 15 million of seafood per year. Since the EU announced that Myanmar will be given the GSP status in the near future, many exporters hope that they will regain their competitiveness in EU market. Although the United States and European Union market are also import for Myanmar fisheries product export, Myanmar fisheries product are mostly exported to Asian fishery market.

Table (4.4) List of Countries Related to Export of Myanmar in 2016/2017

(Metric Ton)

No	Country	Fish	Prawn	Other	Total
1	Singapore	9767.186	363.455	4945.585	15076.495
2	Kuwait	8331.781	3.108	51.877	8386.766
3	Saudi	20756.158	11.284	362.353	21129.795
4	Malaysia	2518.637	1150.565	7960.769	11629.971
5	Japan	84.979	4397.089	1567.539	6049.425
6	Thailand	168426.109	1771.084	40900.757	211097.950
7	China	31409.967	3222.377	65567.885	100200.229
8	UAE	13657.961	151.016	75.524	13884.501
9	UK	6390.791	30.609	188.102	6609.502
10	Hong Kong	126.241	759.893	279.852	1165.986
11	Qatar	3210.600	7.746	58.165	3276.511
12	Korea	287.619	6.561	1076.741	1370.921
13	Bahrain	2084.381	0.662	14.388	2099.431
14	Italy	1669.388	0.005	48.005	1717.398
15	Australia	434.424	0.004	494.230	928.658
16	USA	2547.406	134.102	844.303	3525.811
17	Oman	3933.291	4.340	23.383	3961.014
18	Iraq	5116.660	-	0.200	5116.860
19	Vietnam	224.164	358.170	6290.503	6872.837
20	Bangladesh	7111.144	225.325	3780.864	11117.243
21	Canada	437.960	-	0.450	438.410

22	India	897.752	-	10.000	907.752
23	Ireland	121.030	7.300	-	128.330
24	Jordon	113.363	1.500	3.327	118.190
25	South Africa	106.564	6.802	27.122	140.448
26	Philippines	-	5.940	16.740	22.680
27	France	-	0.160	62.843	63.003
28	Indonesia	-	111.240	8.428	119.668
29	Greece	63.517	-	-	63.517
30	Macau	1.080	-	0.798	1.878
31	Pakistan	135.200	-	-	135.200
32	Germany	42.375	-	-	42.375
33	Sweden	252.208	-	-	252.208
34	Netherland	125.633	-	-	125.663
35	Belgium	23.930	80.239	-	104.169
36	New Zealand	-	-	5.424	5.424
37	Taiwan	2.172	271.875	366.989	641.036
38	Turkey	147.000	-	-	147.000
39	Lebanon	9.360	0.100	3.000	12.460
40	Brunei	12.190	-	7.590	19.780
	Total	290580.039	13082.461	135044.005	438706.505

Source; Department of Fishery, Fishery Statistics 2017

Myanmar's fisheries products are exported to the foreign market by dividing into three types of fish, prawn and other. There are many countries which are import the fisheries product from Myanmar and there have been changed in number of imported countries yearly. In 2002/2003, the countries importing fish and fisheries

product from Myanmar was 43 number of countries, 41 number of countries in 2003/2004, 34 number of countries in 2004/2005, 2005/2006 and 33 number of countries in 2006/2007, 32 number of countries in 2007/2008, 27 number of countries in 2008/2009, 2009-2010 and then 40 number of the countries in 2016/2017.

Although number of importing countries for the Myanmar's fisheries products was decreasing annually, the amount of fishery export metric tons and foreign export earning was increasing in every years. In 2002/2003 which owned 43 number of importing countries, total amount of fishery products export was 103132.560 metric tons while the year of 2016/2017 which owned only 40 numbers countries could produce total amount of fishery products to438706.505 metric tons. Therefore, Myanmar's fishery products export continued to increase even though the number of importing countries continued to decrease. Among the many importing countries of fishery products from Myanmar, top ten countries imported fishery products are presented in the Table (4.5).

Table (4.5) Top Ten Countries Imported Fisheries Products from Myanmar

(Quantity-Metric Ton)

No.	**2011-2012**		**2012-2013**	
	Countries	**Quantity**	**Countries**	**Quantity**
1	Thailand	136278.599	Thailand	137631.665
2	China	92775.645	China	90780.734
3	Kuwait	45496.48	Kuwait	34515.926
4	Malaysia	23325.904	Singapore	26584.447
5	Saudi	20771.698	Saudi	21738.835
6	Bangladesh	17296.858	UAE	15142.596
7	UAE	16045.38	UK	6341.284
8	Singapore	15881.889	Malaysia	19288.339
9	Japan	6839.415	Japan	6895.203
10	UK	6275.849	Bangladesh	9529.391

Source: Department of Fisheries, Fishery Statistics

No.	**2013-2014**	**2014-2015**

	Countries	Quantity	Countries	Quantity
1	Thailand	126645.544	Thailand	127537.529
2	China	82665.926	China	75732.900
3	Kuwait	26196.712	Kuwait	23428.406
4	Singapore	20086.003	Singapore	21453.699
5	Saudi	19672.380	Saudi	20689.382
6	Malaysia	16459.550	Malaysia	16769.467
7	UAE	16008.274	UAE	13838.681
8	Bangladesh	8190.575	Bangladesh	7602.536
9	UK	7123.743	Japan	6750.174
10	Japan	6490.001	UK	5654.002

Source: Department of Fisheries, Fishery Statistics

No	2015-2016		2016-2017	
	Countries	**Quantity**	**Countries**	**Quantity**
1	Thailand	149,567.763	Thailand	211,097.950
2	China	78,217.835	China	100,200.229
3	Singapore	27,049.903	Saudi	21,129.795
4	Kuwait	20,986.639	Singapore	15,076.495
5	Saudi	20,862.038	UAE	13,884.501
6	UAE	14,189.191	Malaysia	11,629.971
7	Malaysia	13,862.229	Bangladesh	11,117.243
8	UK	70,08.604	UK	6,609.502
9	Japan	5,371.332	Japan	6,049.425
10	USA	3,340.950	USA	3,525.811

Source: Department of Fisheries, Fishery Statistics

According to table (4.5), Thailand and China are key important countries from Myanmar. In 2011/2012, Thailand imported the amount of 136278.599 metric ton of fishery products. Moreover, the Thailand was also mostly importing country relative to other countries in 2012/2013, 2013/2014, 2014/2015, 2015/2016 and 2016/2017. China imported the amount of 92775.645 metric tons of fishery products from Myanmar in 2011/2012, 90780.734 metric tons in 2012/2013, 82665.926 metric tons in 2013/2014, 75732.900 metric tons in 2014/2015, 78217.835 metric tons in 2015/2016 and 100200.229 metric tons in 2016/2017 as second mostly importing country. UK and USA lessly imported fishery product from Myanmar because of imposed sanction and then mostly exports go to China.

4.5 Organization or Companies for Fisheries Export

In the 1930s, the exporting of fish product was regulated by an official export licensing system with three large producer organizations having gained a monopoly of exporting frozen an salt products, as they had virtually unlimited export licenses from the authorities. This system was gradually abandoned from 1987.

Today, a large number of small agencies and companies export fish from iceland to various part of the world. Many of the companies distribute their fish products by their own distribution network and the largest companies run their own market departments. There are about 480 registered exporting companies in fishery sector but only about 282 companies are actively conducted the export. The main fishery exporting companies are expressed in table (4.6).

Table (4.6) Top Ten Exported Companies

(USD-million)

No.	**(2009/2010)**	
	Name of Company	**Revenue**
1	Shwe Mann Co,Ltd	16.106
2	Thone Pwint Hsain Co,Ltd	12.855
3	Anawar Hlwam Co,Ltd	11.092
4	Asia Winner Ind'l Ltd	9.857
5	Win Thein & Sons Co,Ltd	8.145
6	Myint Myat Hein Co,Ltd	6.121
7	Good Brothers Co,Ltd	5.975
8	AungMyay Co,Ltd	5.069
9	Asia (M) Zenith Co,Ltd	4.962
10	Advance Sea Food Co,Ltd	4.879

Source; Department of Fisheries, Fishery Statistics

No.	(2012/2013)	
	Name of Company	**Revenue**
1	Amazing Cherry Worls	47.565
2	La Min Htein Htein Thar	40.941
3	Golden October Trading	24.044
4	Shwe Zin Nanttha Co.,	22.388
5	Anawar Hlwan Co., Ltd	20.607
6	Shwe Mann Co., Ltd	19.426
7	Shwe Yamone Co., Ltd	18.523
8	Royal Trading Enterprise	17.399
9	Farmer Phoyarzar Co.,	14.483
10	Mascort Industrial Co.,	10.429

Source; Department of Fisheries, Fishery Statistics

N0.	(2016/2017)	
	Name of Company	**Revenue**
1	Farmer Phoyarzar	27.480
2	Shwe Kyauk Ni Maw Co., Ltd	26.519
3	Ngwe Pinlae Live Stock Breedings & Fisheries Co., Ltd	23.185
4	Annawar Myanmar Trading Co., Ltd	20.769
5	Lap Kaung Co., Ltd	19.592
6	Htoo Htoo Toe	16.312
7	Texchem Food (M) CO., Ltd	16.159
8	K G L Family Co., Ltd	16.025
9	Saint Zayar Co., Ltd	14.507
10	Patamyar Gone Yay Co., Ltd	14.232

Source: Department of Fisheries, Fisheries Statistics

As government has changed its economic policies, private sector invest in a number of facilities such as processing plants, ice plants and cold storages. The plants produce various fish and fishery products. The exporting companies invest processing plant, ice plant and cold storage plant which provide the quality of their products. In

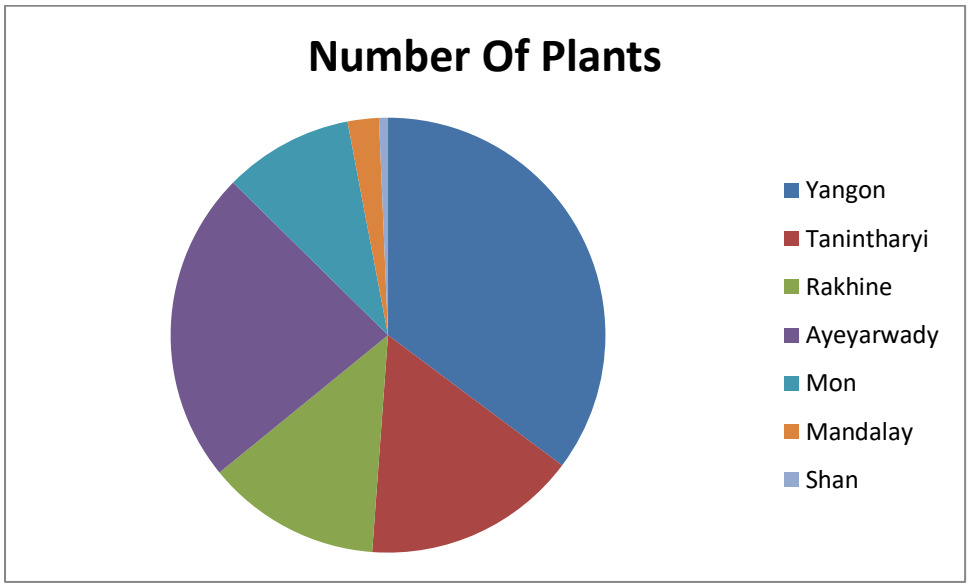
table (4.7), ice plants by State and Division are listed. Most of the ice plants are operated by private sector.

Table (4.7) State and Divisional Registration List of Ice Plant in Myanmar (2016-2017)

No	Region /State	Number Of Plants	Capacity of Ice Plants (Metric Ton Per Day)
1	Yangon Region	106	2364
2	Tanintharyi Region	48	2535
3	Rakhine State	39	456
4	Ayeyarwady Region	70	869
5	Mon State	29	528
6	Mandalay Region	7	30
7	Shan State	2	3
	Total	301	6785

Source; Department of Fisheries, Fishery Statistics

Figure (4.1) State and Divisional Registration List of Ice Plants in Myanmar (2016/2017)



Source; Department of Fisheries, Fishery Statistics

In 2016/2017, there are 301 ice plants operating in fisheries sector. They produced 6785 metric tons of ice per day. In Yangon Region, 106 ice plants can produce 2364 ton of ice per day. In Taninthayi Region, 48 ice plants can produce 2535 ton of ice per day. In Rakhine State, 39 ice plants can produce 456 ton of ice per day. In Ayeyarwady Region, 70 ice plants can produce 869 ton of ice per day. In Mon State, 29 ice plants can produce 528 ton of ice per day. In Mandalay Region, 7 ice plants can produce 30 ton of ice per day. In Shan State, 2 ice plants can produce 3 ton of ice per day. Yangon Region has mostly ice plants because it is main point for trade and electricity.

Two-thirds of catch goes to modern processing, iced, canned, while others are preserved by traditional method. Traditional fish processing farms are practicing salting, sun drying, smoking and fermentation. There are also 10 fish meal plants in Yangon Region, Tanintharyi Region, Rakhine State and Ayeyarwady Region.

4.6 Composition of Fishing Vessels in Myanmar

Several types of fishing vessels are used from the minimal capacity of 30 GRT to high capacity of GRT and above. About 30000 to 33000 boats are operating in marine fishing as a whole. Almost 90% of them are registered as inshore fishing boats and half

of them are non-powered. Foreign fishing vessels are allowed to fish in Myanmar offshore fisheries water under the marine fishing right system.

The fishing efforts have been controlled by the licensing system. Any fishing activities without licenses are illegal. Several provisions have endorsed with fishing licenses, such as, limits in fishing ground, fishing periods, and fishing gear and method.

In general, there are two kinds of fishing vessels; small fishing boat and offshore fishing vessels. And then, the small fishing boats can categorize into two; powered boat and non-powered boat. Offshore vessels can also categorize into two; national and foreign owned. Before the practice of the market oriented economy, the offshore fisheries were totally controlled by the state. Different kinds of fishing vessels are used due to from the shore. The following table represents different kinds of vessels in fishery sectors.

Table (4.8) Fishing Vessels (2007/2008)-(2016/2017)

No	Year	Small Fishing Boat		Offshore Vessels		Total
		Powered Boat	Non-Powered Boat	National	Foreign	
1	2007/2008	14289	15219	1863	248	31619
2	2008/2009	14025	14645	1758	356	30784
3	2009/2010	13788	17054	1814	391	33047
4	2010/2011	13823	15548	2196	396	31963
5	2011/2012	12288	15463	2598	264	30613
6	2012/2013	1215	12757	2724	150	27788
7	2013/2014	12490	13732	2736	153	29111
8	2014/2015	12240	13391	2840	52	28523
9	2015/2016	13831	12583	3030	11	29455
10	2016/2017	16012	10704	3105	48	29869

Source; Department of Fisheries, Fishery Statistics

According to table (4.8), the number of small fishing boats, power boat and non power boats are greater than offshore vessels. In 2007/2008, the participation of small fishing boats is 93.32% and offshore vessels 6.67% in total number of vessels. In 2012/2013, the participation of small fishing boat is 89.66% and offshore vessels 10.34% in total number of vessels. In 2016/2017, the participation of small fishing boat

is 89.44% and offshore vessels 10.56% in total number of vessels, because inshore fishing boats is increased due to the Myanmar Marine Fishery Law (1990).

4.7 Challenges for exports

There are some barriers faced by fisheries exports. Some barriers are export tariff, low electricity, low quality and safety of fish for export, trade sanctions, underdeveloped infrastructure and low technology.

4.7.1 Quality Control and Food Safety System of Fishery Products

Fish marketing for both domestic and export markets require guaranteed fish quality, safety, and proper management systems if export markets were to be sustained. Fish exports largely depend on the quality and safety of fish. Thailand and China were major buyers or customers for Myanmar fishery products. To penetrate the European market, it must be able to give high-quality assurance of its fish to get export earnings. Quality has become a major factor in expanding and sustaining markets.

The quality and safety of fish products in Myanmar are of high concern throughout the catching, handing, processing and distribution chain for both the domestic and export markets. Regarding this, safety and management systems are required to ensure healthy and wholesome fish products.

The national fish quality, safety and management systems and the reference standards used are of considerable importance for international trade. Fish and fishery products safety management system emphasize on prevention of diseases and to meet the standards of importing countries. The implementation of Good Manufacturing Practices (GMPs) and Hazard Analysis Critical Control Point (HACCP) as a quality management system is currently the most important among the food manufactures.

Under the agreement on the Application of Sanitary and Phyto-sanitary Measures (SPS Agreement), governments may apply sanitary measures only to the extent require to protect human health. The Agreement on Technical Barriers to Trade (TBT) seeks to ensure technical regulations and standards that include packaging, marketing and labeling requirements. The increasing globalization of world markets is forcing ASEAN countries to comply with these international standards.

Among various management systems, Codex recommends a HACCP-based approach for food safety. HACCP systems are particularly important for export to

several major markets. HACCP differs from other systems by placing obligation on producers to remove risks to food safety.

Compliance with HACCP and with EU Directives has major concerns of fishery sector. Such quality system has urged the government to initiate a move by which the sector can comply to maintain the country position in the highly competitive seafood trade. In 2010, thirteen factories received a key certificate that would enable them to export fishery products to the EU.

To compete with other fishery exporting countries in the world market, factories should apply relevant quality control system in line with the international standards. To achieve sustainable development in the fishery sector, fish handling and processing and fishery-related industries are important. Insufficient onshore facilities in Myanmar limit the export potential of many fishery products. To increase fishery production and export, there is, to a large extent, a need for construction of ice plants, cold storage facilities, fish meal plans, canning plants and establishments of hatcheries.

All these are in fact included in the sectoral development plans of DOF in Myanmar. Generally, fishery products are exported in the form of raw products. This consequently leads to more intensive need for improved and modernized facilities. In Yangon and other places where fishing is heavily undertaken ice plants are insufficient along with other necessities.

There is still a long way to develop the necessary infrastructure in Myanmar. As essential need in the fishery sector is the electricity supply which is totally insufficient for cold storage and ice plants. The government needs to concentrate more on developing infrastructures, since the inadequate supply of electricity simply leads to higher demand for fuel in the unofficial market at unreasonably high prices.

4.7.2 Technology

Technologies are potential support for fisheries export and can be help in achieving growth of the fisheries sector. To control the quality standards and safety for the export products, technology is very important. Myanmar fishery products are mostly exported as raw material through China because there is only one value-added factory in Myanmar. It is very difficult for any developing countries to stay in the global market because the analytical apparatus, equipment and materials are so expensive to buy and the technology is so high to reach.

4.7.3 Trade Sanctions

Myanmar fish and fishery exports are mostly on the global fish market which is greatly influenced by major fishery importing countries such a United States and European Union. On 29th July 2003, U.S.A executive ordered imposing economic sanctions on Myanmar. Economic sanction included prohibition of remitting money directly or indirectly to Myanmar from U.S.A persons or whatever located, made by foreigners for financing, facilitating or guaranteeing and any product from Myanmar was prohibited for importation into the U.S.A after effective date of this order. As a result, the foreign exchange earnings from Myanmar garments (CMP System) and sizeable quantity of fishery products at main area of exports to U.S.A were hurt by the sanctions. US buyers could no longer do business with Myanmar as a result of trade sanctions. Before the trade sanctions were imposed, the United States purchased US$ 25 million of frozen shrimp and US$ 3 million of frozen fish per year from Myanmar exporters. After the US and Canada also imposed sanctions in 2008, stopped importing.

Chapter (5)

Conclusion

5.1 Findings

Myanmar is endowed with big rivers, huge network of tributaries, and a long sea coast that possess rich fisheries. The fishery sector in Myanmar has a large potential to contribute to food security, employment and economic development. Fisheries sector is an important source of income and animal protein for the domestic population.

The fishery resources of Myanmar play crucial role in the production of fisheries. Rapid production has resulted in increase in demand for fish, increasing recognition of the contribution of fishery to nutritional and food security. In Myanmar, production, processing and marketing of all fishery activities are carried out by private sector. All stated-owned fishing vessels, ice plants, processing plants, cold storages and fish-meal plants are sold or lease to private sector. Fishery production has been spreading all over the country.

Both freshwater and marine fisheries are domestic consumption items as well as crucial export items in international trade. Although the extent of aquaculture has been pronounced in recent years, the products from marine fisheries are still contributing larger share in the total fisheries landing. However, the products are given priority for export and only the surplus in used in the domestic market. Due to the lack of proper reporting and recording system, it is difficult to clarify the actual domestic use of the fisheries products.

In 2016/2017 fiscal years, the total production of fish was (5,675,470 metric tons) and then subtracting exports (438,706 metric tons) give the total available fish for consumption in Myanmar approximately (5,236,764 metric tons). Myanmar has a population (52.92) million and per capita consumption of fish was (99) kg in the fiscal year 2016/2017. According to table (3.1), per capita fish consumption is increasing annually although population has grown. In 2007/2008, per capita consumption was 49 kg, 68 kg in 2011/2012 and it increased up to 99 kg in 2016/2017 because of the increasing production of fishery products.

Myanmar fishery production has been increasing year after year during the ten year period from 2007/2008 to 2016/2017. Myanmar fishery sector could produce

(3,193,920 metric tons) in 2007/2008 and then it increased to (5,675,470 metric tons) in 2016/2017. In order to achieve the high rate of fishery production in the long run, DOF has conducted conservation and rehabilitation of fishery resources, promotion of fishery researches and surveys, collection and compilation of fishery statistics and information, extension services, supervision of fishery sector and sustainability of fishery resources. DOF also provide financial assistance and loans through Livestock and Fisheries Development Bank. The critical source of increasing fishery production after allowed the private sector is due to the specialization of aquaculture fishery. After 1988, fishery exporting businesses were allowed to private sectors and fisheries sector has been developing rapidly during a short period.

Myanmar fisheries production includes two types of fisheries, Freshwater Fisheries and Marine Fisheries. Freshwater fisheries consist of (a) aquaculture (b) leasable (c) open fisheries. Marine fisheries include (a) in-shore fishery and (b) off-shore fishery.Myanmar fishery production has been dominated by the marine fishery rather than freshwater fishery.

As well as the fishery production increases, the surplus of fishery products in domestic market go to the export market. Growth of an economy is directly related to exports. If exports increase at a faster pace as compared to imports, nothing can stop an economy from being a developed one. On the other hand, the lower exports mean low foreign earning and low foreign earning in turn means a small purchasing capacity of a nation in the international market the export of Myanmar fishery products has been increasing year after year.

In total, fish and fisheries export volume increased from 351652.05 metric ton in 2007/2008 to 438706.51 metric ton in 2016/2017. The fisheries export value increased from US$ 561.02 million in 2007/2008 to US$ 605.82 million in 2016/2017. These export quantity and value are earned from both normal trade and border trade. The export of fisheries products is increasing because the area of fish ponds were expanded from (441098) acres in 2007-2008 to (487525) acres in 2016/2017 due to the freshwater fisheries law enacted in 1991.

After the fishery sector privatization in 1994/95, fishery exports have grown and this sector became one of the major contributions in foreign exchange earnings. In

Myanmar, there are 646 fish and fisheries species. Myanmar exported its fish and fisheries products through border trade and normal trade.

5.2 Suggestions

The public and private sector need to establish the required onshore facilities such as ice plants, processing plants and cold storages. The fishery products such as fish, prawn, shrimp etc, should be exported as fresh fishery products to abroad. Therefore, there is an important need to upgrade the fish products to be semi-processed or value-added in order to increase to value. It is good for fishery industries to get electricity regularly. Production processes are needed to improve and upgrade until international standard in fishery sector.

For promotion of fish exports, it is important to have quality control in Myanmar. The fishery sector should develop and apply fish quality and safety management systems that support the current competitive position of Myanmar fishery products in the regional and world markets through the implementation, validation and promotion of HACCP, GMP, GHP and improved laboratory practices, the promotion and conduct of training programs to upgrade the technical skills and competencies of personal in the private sector and the strengthening the compliance of fisheries industry to regional and international requirements.

Government activities are in fact the most important among all factors leading to the overall growth and development of fishery sector itself. A government should make the policy which encourages more investment in fishery production and must provide the infrastructure such as electricity which is key for cold storage in the fish vale chain to promote fishery export of Myanmar.

New production and processing technology are being increasingly introduced. Most of Myanmar fishery products are exported as raw materials. The importers reprocess or transform these raw fisheries from Myanmar for further marketing them into other external markets. In this regard, there is an important need to upgrade the fish product to be semi-processed or value-added in order to increase its value. The approaches to upgrade traditional fishery processing and preservation methods as well as market promotional are also crucial for the effective of fishery exports.

Nowadays, the export of fish and fishery products is at high demand on the world market. Therefore, they are needed to be in good quality, properly graded, packages. For these purpose, a number of measures needs to be done: provision of adequate processing and ice making facilities, which must be properly matched to increasing fishery exploitation, implementation of hygiene and quality control measure must be done before being exported.

References

Aye Marlar Thwin (2013). Development of Fisheries Sector in Myanmar. Yangon: Yangon University of Economics.

Department of Fisheries (2013). *Fishery Statistics* 2013. Yangon: Department of Fisheries.

Department of Fisheries (2015). *Fishery Statistics* 2015. Yangon: Department of Fisheries.

Department of Fisheries (2017). *Fishery Statistics* 2017. Yangon: Department of Fisheries.

FAO (2012). *Fishery Country Profile in Myanamr*. Rome: Food and Agriculture Organization of the United Nations.

FAO (2016). *The State of World Fisheries and Aquaculture*. Rome: Food and AgricultureOrganization of the United Nations.

Khin Maung Soe (2008). *Trends of Dvelopment of Myanmar Fisheries*: With References to Japanese Exportation. Yangon: Institute of Developing Economies, Japan Externel Trade Organization.

Kalaitzi, A. S. (2015). *The Causal Relationship between Exports and Economic Growth*. Manchester : Manshester Metropolian University.

Majeed, M. T. (2014). *Determinants of Export in Developing Countries*. Pakistan: Quaid- i-AzamUniversity.

Minn Maung Oo (2013). *The Effect of Trade Liberalization on Myanmar Foreign Trade*. Yangon: Mekong Institute.

Netherlands: Ministry of Foreign Affairs of the Netherlands. Retrieved from www.cbi.eu/.

Nilar Myint Htoo (2011). *Trade Liberalization and its Impact on Fishery Sector in Myanmar*.Yangon: Yangon University of Economics.

San Win Naing (2015). *A Study on the Fishery Export in Myanmar*. Yangon: Yangon Uiversity of Economics.

Sheridan, B. J. (2012). Three Essays Concerning the Relationship between Exports, Macroeconomic Policy, and Economic Growth. *These and Dissertations--Economics*.

Soe Win Naing (2013). *An Analysis on the Performances of Fishery Sector in Myanmar*.Yangon: Yangon University of Economics.

Sorokina, V. (2012). *Factors Influencing Export Performance*. Sweden: Lulea University of Techlogy.

Tun Naing (2014). *A Study on Fishery Production and consumption in Yangon Region* (2001- 2012). Yangon: Yangon University of Economics.

Ukama, E. E. (2012). *The Relationship between Export Performance and Global Economic Performance*. South Africa: Gorden Institute of Business Science ,University of Pretoria.

UR, L. W. (2012, December). *Myamar Seafood Exports Qick Scan of The EU Market Potential*.