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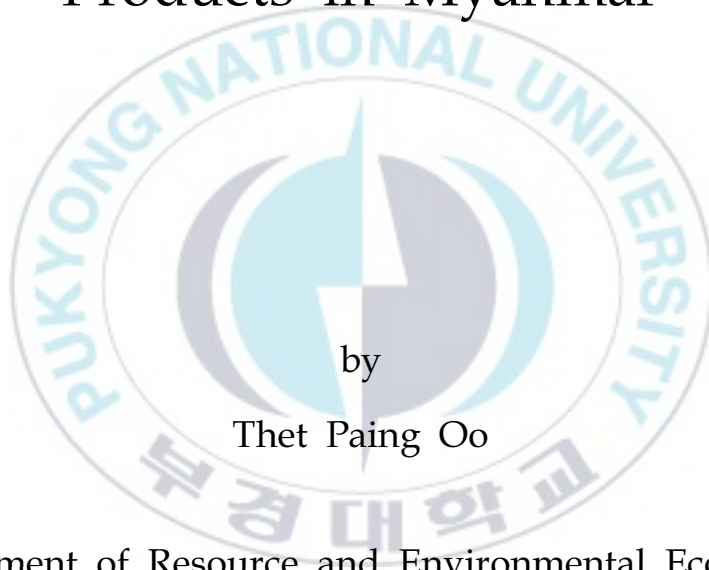
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Thesis for the Degree of Master of Economics

# Analysis on Distribution Structure of Fishery Products in Myanmar



by

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February 2020



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미얀마의 수산물 유통구조에 대한 분석

Advisor: Prof. Hyong Mo Yoon

by

Thet Paing Oo

A thesis submitted in partial fulfillment of the requirements  
for the degree of Economics

in Department of Resource and Environmental Economics,  
The Graduate School, Pukyong National University

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# Analysis on Distribution Structure of Fishery Products in Myanmar

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February 2020



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# List of Abbreviations



SEAFDEC	: Southeast Asian Fisheries Development Center
NACA.	: Network of Aquaculture Centers in Asia-Pacific
FAO.	: Food and Agriculture Organization
FIC.	: Myanmar Foreign Investment Commission
FDI.	: Foreign Direct Investment
EEZ	: Exclusive Economic Zone
JFDP	: Joint Fishery Development Program
FR	: Fishing Rights
JV.	: Joint Venture
ICD.	: Inland Container Depots
TEU.	: Twenty-foot Equivalent Unit
DOF.	: Department of Fisheries
YCDC	: Yangon City Development Committee
CSO.	: Central Statistical Office
MFE	: Myanmar Fishery Enterprise



# 미얀마의 수산물 유통구조에 대한 분석

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## 요    약

본 논문은 미얀마의 국내 총생산 (GDP), 동물성 단백질 소비, 고용 및 해양 수산 영역 및 지방 정부 수입의 현황을 살펴본다. 미얀마 수산업의 물리적 환경 조건은 Rakhine, Ayarwady, Yangon, Mon, Tininyaryi의 5개 어업 지역으로 구성된다. 이들 지역은 인구 밀도가 높고 운송 시스템이 발전하여 미얀마 수산경제 발전에 중요한 역할을 담당하고 있다.

본 연구의 목적은 미얀마 수산경제 발전에 기여하고자 수산물 가공 과정 및 상품 무역 확대 방안을 분석해 보는데 있다. 특히, 본 연구는 이들 어업분야의 외국인 투자와 국내 투자가 어떻게 운영되고 있는지, 그리고 미얀마 어업분야의 수출 성과는 어떠한 지를 분석해 보고자 한다.

연구 방법으로 본 연구는 미얀마 수산물 수출의 상대 효율성을 평가해 보고자 2000년부터 2018년까지의 시계열 데이터를 사용하여 선형회귀 분석을 실시한다. 분석 결과, 미얀마의 경제 성장을 촉진하기 위해서는 미얀마의 수산물 수출 수준이 여전히 낮음으로 수산물 수출의 확대 정책을 필요할 것으로 판단된다.



# I . Introduction

Destination Myanmar, a country in Southeast Asia, bordering the Andaman Sea and the Bay of Bengal south. It is bordered in north and northeast by China, in the east by Laos and Thailand, in the west by Bangladesh and the Indian. The total area of Myanmar comes to approximately 252,237 square miles. Of this area, about 7,718.45 square miles are coastline, and the remaining 244,518.55 square miles are comprised of the land. Myanmar is roughly 3.06% water and 96.94% of the land. The water areas include the shore along the Bay of Bengal. The total population is about 54 million in 2018.

The fisheries sector in Myanmar, comprising the freshwater fisheries, marine capture fisheries, 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. Myanmar is a “rice-fish culture”, where rice provides the majority of energy in the diet, and fish provides a major share of micro-nutrients. Ensuring adequate availability and accessing fish supplies are therefore critical to ensuring food and nutrition security in a country where one out of every three children is stunted and one out of four are underweight. The fisheries sector plays a vital role in the culture and socioeconomic life of Myanmar. Traditionally Myanmar people prefer freshwater fish to marine fish. With the population of Myanmar 54 million in the



year 2018, the per capita fish consumption is 22.7kg/year.

According to the Myanmar fishery statistics, the total fish production was 5.87 million metric tons in the 2017–2018 of fiscal year. In this period, the production of freshwater fish was 2.72 million metric tons (46% of the total fish production) and the production of marine fish was 3.15 million metric tons (54% of the total production of fish in Myanmar). The exported amount of fish and fishery products was 0.57 million metric tons and the value of which was USD 711.72 million in 2017–2018. It was exported to 46 different countries. The exported amount was 10% of the total production of fish in Myanmar for this period, 2017–2018. In this situation, the marketing and distribution of fisheries in Myanmar need to be improved. In preparing this paper, attempts have been made to analyze the fishery sector of Myanmar. The export and distribution of the Myanmar fisheries sector were based on the ordinary least square method using data for a period from 2000 to 2018.

This study presents data derived from secondary sources and primary research. Official statistics on fish production and fish exports were collected from the Central Statistical Office (CSO) and the Department of Fisheries (DoF).



## II. General Status of Fishery Industry

### 1. Fisheries Production

Fish is one of the most important sources of animal protein and micro-nutrients in Myanmar with average consumption levels estimated to be approximately 23kg/person/year. However, with significant levels of malnutrition in the country, these figures are likely to hide a large diversity of consumption patterns. The fisheries sector in Myanmar employs 3.2 million people (0.8 million full-time and 2.4 million part-time).<sup>1)</sup>

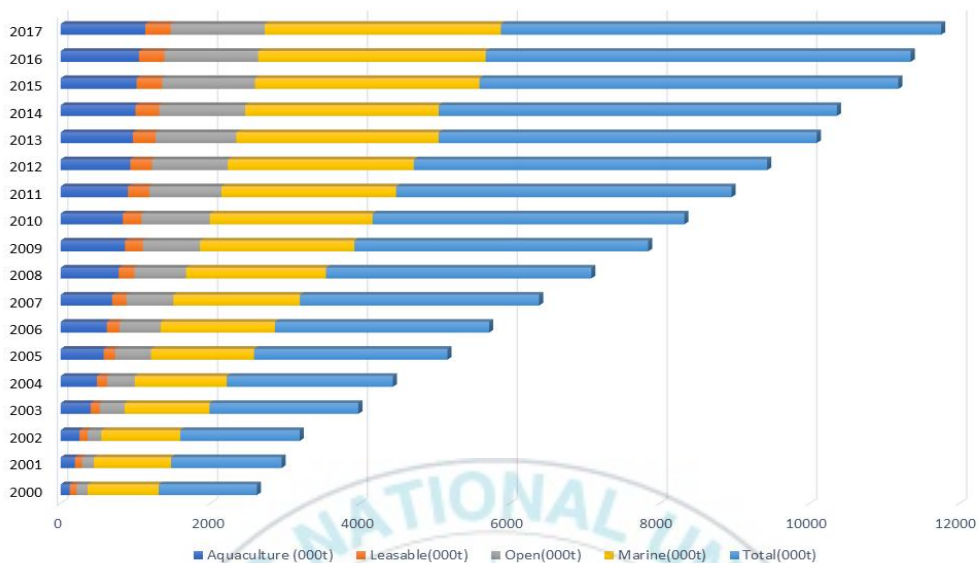
In 2017, the total production of fish was 5.87 million metric tons of which 3.15 tones were marine fish (Department of Fisheries, 2017). According to SEAFDEC (2017) catches have grown at the rate of 10% year on year from 2000 to 2014. The Department of Fisheries (2017) lists the following landings (and aquaculture production) for the period 2000/01 to 2017/18. Marine landings have almost doubled in less than a decade.<sup>2)</sup>

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1) <https://www.worldfishcenter.org/country-pages/myanmar>.

2) Myanmar fisheries, situation report Duncan Leadbitter Fish Matter Pty Ltd, 2017.





Source: Myanmar Fishery Statistic 2017.

[Figure 1] Fisheries Production in the period 2000/2017

## 1.1 Processing

Various methods of processing are used to preserve perishable fish and shrimp. The lesser-known processing method is presented here.

## 1.2 Drying

There are two methods of drying

1. Drying in the sun
2. Dehydration

A special method of making a special product called Ngabokechawk, the dry fish is worth mentioning in Yangon



Division. And also Giant Sea Perch made from this dry fish. Heads and tails are cut off and visceral organs removed. After being split, the split fish is spread in water or 12 hours to be half-rotten. The rotten fish is marishes with salt and left for two hours. The salted fish is washed thoroughly and dried in the sun for 4 to 5 days. It has no hard backbone and a characteristic sweet taste formed by some organic compounds coming out of the bones. Some Myanmar people pay a good price. The method of drying shrimp is quite different from that of dry fish. Shrimp dried are put into a large vessel and boiled for round about ten minutes. Then the shrimp are dried in the sun for a few days depending on the sun's heat or weather conditions. Soft-shell is early removed first when the shrimp is dried.

### **1.3 Smoking**

Smoked products have usually better flavor compared to dried products. People like smoked products and it is more famous among in Myanmar consumers. In some areas, salt is not readily available in large quantities but firewood is abundant at a reasonable price. Smoking is a very common way of fishes especially when there is a good market or demand for it. Bamboo is put up open-air just low enough for the smoke to reach the thoroughly washed spat fishes. The firewood that gives off much smoke is the best for the purpose. To reduce the heat and draw more smoke, green leaves may be added to the fire under the



rocks. Half a day or a day of smoking is quite good. It should be remembered that keeping quality is better when smoke gets into the tissues slowly. River eel, carp, and catfish are usually smoked.

#### **1.4 Salting**

Salting is a very good way of preserving fishes for 3 to 4 days. Salted fishes are cooked like fresh fishes. These tastes are similar to fresh ones. The product is a little bit hard and the fish smell disappears. So, some people prefer salted fish to fresh fish. Fishes salted must be scaleless and headless. Then they are cut open to be eviscerated. The fishes are now washed and strained. Some salt dissolves in fish juice that comes out of the fish body. If there is insufficient salt, the fish becomes soft and will not last very long. With a good amount of salt, the product turns into what is known as the Ngapi gang. It can be found in North Kalapa and Hlaing Thayer.

#### **1.5 Fermented Fish**

Nga Be Pyu, Nga Kone Ma, and Carp fries are good to be fermented. Scales, heads and alimentary tracts are removed. Then they are wash and the water is strained. The amount of salt to be used is slightly more than that is used in cooking. If more salt than needed is used, it takes longer to ferment. The desired amount of cooked rice is added to mix thoroughly with the fish. This mixture of salted fish and cooked rice can be leaves or



placed in earthen vessels covered and pressed under banana leaves and left to be fermented in 3 or 4 days. It can be found in every township of Yangon Division.

## 1.6 Ngapi Making

Two main classes of ngapi are:

- (1) Ngapi made from fish
- (2) Ngapi made from shrimp

Based on processing method and consumption ngapi is classified as:

- (1) Sein Sar
- (2) Hmyin
- (3) Daminn
- (4) Ngapi Yei Gyo
- (5) Ngapi Gang
- (6) Sone Htone
- (7) Sa Phyu
- (8) Nga Note
- (9) Kaung Latt
- (10) Doe Wine
- (11) Gang Phyt
- (12) Thone Oo Satt
- (13) Htaung Tha
- (14) Nga Sa Nae



## **1.7 Sein Sar Ngapi**

A fisherman uses conical nets to catch tiny marine shrimps while they are swimming in large numbers on the surface of the sea. They have placed the bamboo racks. Salt (25% to 30% of the weight of shrimp) is sprinkled over the shrimp which is dried in the sun for a few days until the shrimp is dried. Traditional mortar and pestle or modern grinders may be used. When salt is thoroughly mixed with the pounded or ground shrimp the product is put into earthenware to become a good quality product for 1 to 2 months.

## **1.8 Hmyin Ngapi**

First, those small marine shrimps are placed on straining racks. New rakes are used (to raise and let fall on shrimps) while salt is being sprinkled on them. After being dried in the sun for 3 to 5 days, the shrimps are pounded just to break them in the middle.

Khakyo Hmyin or broken Hmyin is mixed with additional salt, broken rice powder or rice flour and coloring matter of the desired color. Partly processed Hmyin Ngapi is dried in the sun and pounded to give us Soandone ngapi. At this stage, some workers wearing leather shoes do the threshing on the product while some other worker keeps sprinkling salt, flour and coloring matter. The job is tiresome and strenuous. Nowadays ngapi makers have introduced power grinders to use sanitary methods to make a



cleaner product.

## **1.9 Fish Meal Production**

The inedible parts of the fish and the parts that are not fish for human consumption are ground after dehydration. This is rather a new product in Myanmar and there are only two fish meal plants one in Danyingon and the other in Myeik. Two completely different grades of this product are put out by manufacturing. High-quality ground fish meal in the form of fine powder is mixed with sticky rice powder, seasoning powder, and salt. The mixture in the form of dough is rolled and sliced into disks. The disks are then dried to be marked as fish water for human consumption. For more than the last thirty years fish meal has been used as one important protein supplement in poultry and pig rations around the world. It is now being used on some livestock farms in Yangon Division.

## **1.10 Fish Sauce Top of Form**

Formerly fish sauce is kept in earthen vessels. But at present small brick pond made to use as storage tanks for fish sauce.

Fish sauce is obtained in two ways:

### **(1) Bottom of Form**

Usually, a 24-meter room with a special cement floor is used. The central portion of the cement floor as seen in the diagram is sloping towards the center. The dripping fish sauce can readily go



down to the center tank. This product is called “AIK HTUK YI”. (1.10.2) The other way of extracting fish sauce from Ngapi is very simple. From time to time we can collect fish sauce on top of Ngapi in Ngapi vessel. This product is known as “SINT TAT YI”. In Yangon Division has a “PWINT KOUNG” fish sauce factory in Thuwana Township.<sup>3)</sup>

## 2. Small Scale Processing

In addition to industrial-scale processing operations, there are also many small businesses located at San Pya and Shwe Padauk markets that produce nga chit - a paste made of ground fresh fish flesh, which is a popular ingredient in curries and many other dishes. Traditionally nga chit was made with bronze featherback (nga phel; *Notopterus notopterus*), a fish source of freshwater capture fishery. However, this species is increasingly rare and expensive, and small farmed rohu is now the main raw material used by the processor at San Pya to make nga chit. (Nga chit made from rohu costs around USD 8/kg, whereas that made using featherback costs around USD 15/kg.)

Byproducts from nga chit production include fish skins (fried and sold as snacks), fish heads (sold into retail markets for making soup), and swim bladders (dried and exported to China). Fish frames (bones with attached scraps of meat) are sold as feed for African walking catfish farms. The production of walking

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3) Khaing Khaing Lwin, Fishing Industry of Myanmar, 1983–2000.



catfish was initiated after the growth in nga chit production to utilize this supply of byproducts, and there are reportedly now 100 ponds close to Yangon using nga chit processing waste as the main input. Almost all the nga chit producers at San Pya originate from a single village, close to the market on the opposite side of the Yangon River. The number of businesses producing nga chit at San Pya was reported to have grown rapidly, from none in 2004 to 14-15 in 2009, to more than 50 in today, employing, according to one informant, as many as 1,500 workers, most of them women, earning up to \$10 day for the semi-skilled processing work. This rapid growth was said to have taken place in response to demand from Nay Pyi Taw and elsewhere in Upper Myanmar.

### **3. Cold Storage in Myanmar**

Modern fisheries require cold storage because fishes and shrimp lose freshness when kept at a temperature above the freezing point. Rotting may be slow at first but later the fish or shrimp becomes unfit for human consumption. At first, the cells become blocked. After passing this stage the fish or the shrimp becomes stiff, but rotting has not started until this time. Now is the latest time to be placed in cold storage or to be covered with pieces of ice to keep the temperature down. If the shrimp or fish is kept in a warm or hot room, it may turn slimy and soft. The process called autolysis and the sliminess and softness is caused by one



enzyme contained in the tissues.

Modern fishing vessels have cold storage aboard the vessels to keep the catch for many days while the vessels are fishing on the sea. All dealers handling fresh or processed fish and shrimp also need cold storage facilities before transporting to overseas markets or domestic markets.

There are numerous cold storage facilities located around Yangon, particularly in its industrial zones, where large wholesale traders and exporters rent space to store stock. There is one cold storage facility located at San Pya, operated by a military-linked business group, which sources and freezes fish for processors and exporters. Cold stores in other locations perform similar functions. Many processors and some exporters have cold storage facilities integrated into their operations, and some businesses combine all three functions.

There were 77 seafood processing factories in Yangon Division in 2014 (Table 1), of which 57 were reported to process fish for human consumption (the remainder specializing mainly in processing shrimp or producing fish meal). Two hundred and eighty-nine companies are recorded as having exported fish and seafood products from Myanmar by the sea in 2012, and 211 as having exported fish by overland border trade. Most of these businesses were small, exporting less than 500t/year, with only four reported to have exported to about 10,000t.<sup>4)</sup>

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4) FAO & NACA, Food and Agriculture Organization, 2003.



<Table 1> Numbers of seafood processors in Myanmar by state/region in 2012

Region/State	Number of Seafood Processors
Yangon	77
Tanintharyi	18
Ayeyarwady	6
Mon	7
Rakhine	5
Shan	1
Total	144

Source : DoF, 2012.

Fishes can be chilled or frozen after removing heads, scales fins, and visceral organs. The handling and processing method for shrimp is somewhat different. When the shrimps are fresh, they are chilled without removing soft shells. If they are not so fresh, the heads and soft shells are removed before placing the commodities in the cold storage. Whole fish may be transported directly to the market area. Giant SeaPerch, Shark, and fishes with a small number of bones are sliced. Rohu (Nga Myint Chin), Carp (Nga Gyin) Katla are out open and digestive tracts and livers taken out before being frozen.

Hilsa (Nga Thalauk), Ribbonfish (Nga Pa Gan), Yellow Croaker (Thin Wa), John's Snapper (Nga Pa Ni) are frozen whole. Plant No.5, Ahlon Cold Storage deals with fishes separately.

Japanese Daigo and Thunder Theingi Joint Venture handle Squid



and Cattle Fish. Cattle fish bodies, eyes, and heads are processed separately. Heads, ears, and bodies of Squid are also processed separately. Shrimps are processed in two ways for the market. Headless shrimp is called the first quality processed shrimp. Another class is without a soft shell and head. Shrimps coming from different regions are sorted and weight first. Then heads are removed, and they are graded by guess. After that machine grading is done. Graded headless shrimps are frozen at 30C for 4 hours in blocks. Paper boxes containing frozen shrimp blocks are held at 18 c to kill the virus before shipping. Those blocks for export are then inspected for quality by responsible Officers from Department fisheries. During this interim period, samples are sent to the National Health Institute Laboratory for the microbiological test.<sup>5)</sup>

Depending on the size of shrimp from 4 to 4 dozen processed shrimp may weigh a pound. After holding the frozen product in freezers for 4 hours, 12 Kg boxes each containing 6 blocks are ready to be shipped. It is a customary practice for the processor to use labels and cards supplied by the purchasing or exporting company. Fish and shrimp come from Yangon Division, Ayeyarwady Division, Mon State, Rakhine State, and Karen State. Some companies buy them on a contract basis and transport them by trucks, aircraft, and vessels. Freshwater Hilsa, Rohu, Carp, and freshwater shrimps' principal items. Hilsa comes from Bogalay,

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5) [https://webgate.ec.europa.eu/sanco/traces/output/MM/FFP\\_MM\\_en.pdf](https://webgate.ec.europa.eu/sanco/traces/output/MM/FFP_MM_en.pdf).



Laputta, Pathein is Pyapon of Ayeyarwady Division. Giant Tiger Prawn comes from Rakhine and Mon States. Freshwater shrimp season begins in May and ends in November. Marine shrimps such as Giant Tiger Prawn, White or Banana Prawn, and Pink or Jinga Prawn are obtainable after December.

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the export price states that it must not be less than the minimum price fixed by the Department of Livestock and Fisheries to prevent the export at a price below the international price.<sup>6)</sup>

<Table 2> Cold Storage List in Myanmar (2018)

Approval number	Name	City	Regions	Activities	Date of request
LPT/002/TMLL/DOF	Texchem Marine Laputta Limited	Laputta	Ayeyarwady	PP	24/05/2017
LPT/003/MF/DOF	MEF International Co., Ltd	Laputta	Ayeyarwady	PP	24/05/2017
MGIE/010/PT/DOF	Pyi Phyo Tun International Co., Ltd.	Kyun Su	Tanintharyi	PP	26/06/2018
PTHN/001/AYWD/DOF	Ayeyarwady Fisheries Limited	Pathein	Ayeyarwady	PP	23/11/2010
YGN/037/HNL/DOF	Htun Nay Linn Co., Ltd	Yangon	Yangon	PP	11/04/2013
YGN/041/YFL/DOF	Yuzana Fisheries Ltd	Yangon	Yangon	PP	23/11/2010
YGN/067/MZN/DOF	MIN ZAR NI CO LTD	Yangon	Yangon	PP	13/12/2013
YGN/071/SYM/DOF	Shwe Yamone Manufacturing Company Limited	Yangon	Yangon	PP	16/12/2009
YGN/075/MMF/DOF	Mega Marine Frozen Sea Food Co., Ltd	Yangon	Yangon	PP	24/05/2017

6) Fisheries, International Trade and Sustainable Development), 2006.



Approval number	Name	City	Regions	Activities	Date of request
YGN/077/M YM/DOF	May Yu Marine Products Co., Ltd	Yangon	Yangon	PP	16/12/2009
YGN/079/T BS/DOF	Twin Brothers Seafood Cold Storage	Yangon	Yangon	PP	16/12/2009
YGN/087/S N/DOF	Shwe Ngar Processing & Cold Storage Plant	Yangon	Yangon	PP	13/12/2013
YGN/090/M MH/DOF	Myint Myat Hein Co., Ltd	Yangon	Yangon	PP	16/12/2009
YGN/100/G WI/DOF	Ghani Win International Modern Processing Plant and Cold Store	Yangon	Yangon	PP	13/11/2014
YGN/102/S M/DOF	Shwe Myanmar Cold Store	Yangon	Yangon	PP	23/11/2010
YGN/104/G BL/DOF	Golden Bay Limited	Yangon	Yangon	PP	28/06/2018
YGN/114/K YZ/DOF	Hlaing Htate Khaung Cold Store.	Yangon	Yangon	PP	13/12/2013
YGN/115/U VS/DOF	Universal Cold Store	Yangon	Yangon	PP	13/12/2013
YGN/116/O S/DOF	Ocean Pacific Cold Storage	Yangon	Yangon	PP	13/12/2013
YGN/119/S KB/DOF	Shwe Kaba Cold Store.	Yangon	Yangon	PP	13/12/2013
YGN/123/S GCW/DOF	SG C rabs World Limited	Yangon	Yangon	PP	10/18/2015

Source: [www.foodindustrydirectory.com.mm](http://www.foodindustrydirectory.com.mm).



<Table 3> Ice Plants in Myanmar 2018 (By Region & State)

No	Region and State	Number of Plants	Capacity of Ice Plant (Metric Per Day)
1	Yangon	106	2364.06
2	Tininthayi	48	2535.60
3	Rakhine	39	456.00
4	Ayeyarwady	70	869.00
5	Mon	29	528.00
6	Mandalay	7	30.00
7	Shan	2	3.20
Total		301	6785.86

Source: Fisheries Statistic of Myanmar, DoF. 2018.

#### 4. Myanmar Fisheries Laws

On-time inundated areas in Delta were fish-catching places where fishes inhabited. After the completion of the Suez Canal, fishing grounds disappeared because of the extension of paddy cultivation. Because of the clearing of bushes and creepers where fishes could stay, land reclamation, or transporting of carts and bullocks, fish inhabited areas or fishing grounds disappeared. Similarly, traveling to and from paddy fields becomes inconvenient because ingoing waterways to paddy fields were blocked to catch fish. Such a problem of fish and paddy field arose frequently which led to the emergence of fishing laws.

Fisheries act in Burma Fisheries Manual of 1905 is no longer suited to the needs of the changing conditions of the country and its present economic structure and politics. Therefore, Myanmar



government enacted and issued 20 pages Freshwater Fisheries Law on the 4th of March 1991.

Chapter 1 of this booklet given a definition of many terms that need clarification, Chapter 3,4,5,6 contains application for and issue of Lease and License, Permission to operate a fishery in foreign currency, payments. Duties and rights of people operation fisheries and conditions for the refund. Invalidation of Permission to operate a fishery, appeals, prohibitions, and penalties can be found in Chapters 10 to 13.

This chapter of the thesis deals with the following 4 sections of Myanmar Fisheries Law. I have tried in translating and simplifying Myanmar Version on these 4 sections without changing or adding the original written and published in that booklet by the Department of Fisheries.

Department of Fisheries has fixed fishing zones for Rakhine State, Ayeyarwady Division, Mon State and the Tanintharyi Division for those intending to operate offshore fisheries.<sup>7)</sup>

#### **4.1 Fishing Zone for Rakhine State**

A total of 30 squares namely A1 to A20 and B1 to B10 for Rakhine State fishing have been demarcated and are shown in pink in the map of Myanmar Waters.

Vessels that have obtained Rakhine State offshore fishing license are allowed to fishing zone except in water within 5 miles from

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7) Myanmar Fisheries Act 1991.



the coast inshore waters).

#### **4.2 Fishing Zone for Ayeyarwady Division**

A total of 44 squares namely B11 to B20, C1 to C25 and D1, D4, D5, D9, D10, D14, D15, D19, D20 have been demarcated for Ayeyarwady Division and the squares for this zone are shown in yellow in the map of Myanmar waters.

Vessels that have obtained Ayeyarwady Division offshore fishing license are allowed to fish within the above fishing zone except in waters within 10 miles from the cost (onshore fishing area).

#### **4.3 Mon State Fishing Zone**

A total of 14 squares namely D2, D3, D4, D6, D7, D8, D11, D12, D13, D16, D17, D18, D21, D22, D23 for Mon State have been demarcated and are shown in Yellow and Light-Yellow in the map of Myanmar waters.

Vessels that have obtained Mon State offshore fishing license are allowed to fish within the above-mentioned fishing zone except in water 10 miles from the cost (onshore fishing area).

#### **4.4 Tanintharyi Division Fishing Zone**

A total of 52 squares namely D24 to D29, E1 to E25, and F1 to F21 for the Tanintharyi Division have been demarcated and the square for this zone is shown in Orange color in the map of



Myanmar waters.

Vessels that have obtained the Tanintharyi Division Fishing License are allowed to fish within the above-mentioned fishing zone exception waters within 10 miles from the coast (onshore waters).<sup>8)</sup>

#### **4.5 Demarcation of fishing Zones**

Ministry of Livestock and Fisheries issued Order No.1/88 dated 10th November 1988 to announce the Demarcation of Fishing Zones along Myanmar coastline following order of the previous time. Unlike Ayeyarwady and Tanintharyi coastlines Rakhine coastline is quite steep and fishing ground near the shore or inshore fishing area is marked just 5 miles from the shore. Fishing licenses are issued for the use of vessels, implement engineless boats, with traditional fishing implements, measuring thirty feet in length and equipped with 12 horsepower engines.

Such kind of demarcation was made to help hand to mouth native fisherman to make themselves earn a living by making a fishing trip within a day. Problems have arisen frequently because travelers would get entangled with dipping nets, floating nets and fishing lines cast by native fishermen and demarcation of the boundary of the fishing area was done with sympathy towards the natives.

The majority of fishing equipment used by the natives, depth of

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8) Myanmar Fisheries Situation Report October 2017.



water where they fished and the distance between the shore and their fishing site were studied and considered for the demarcation.

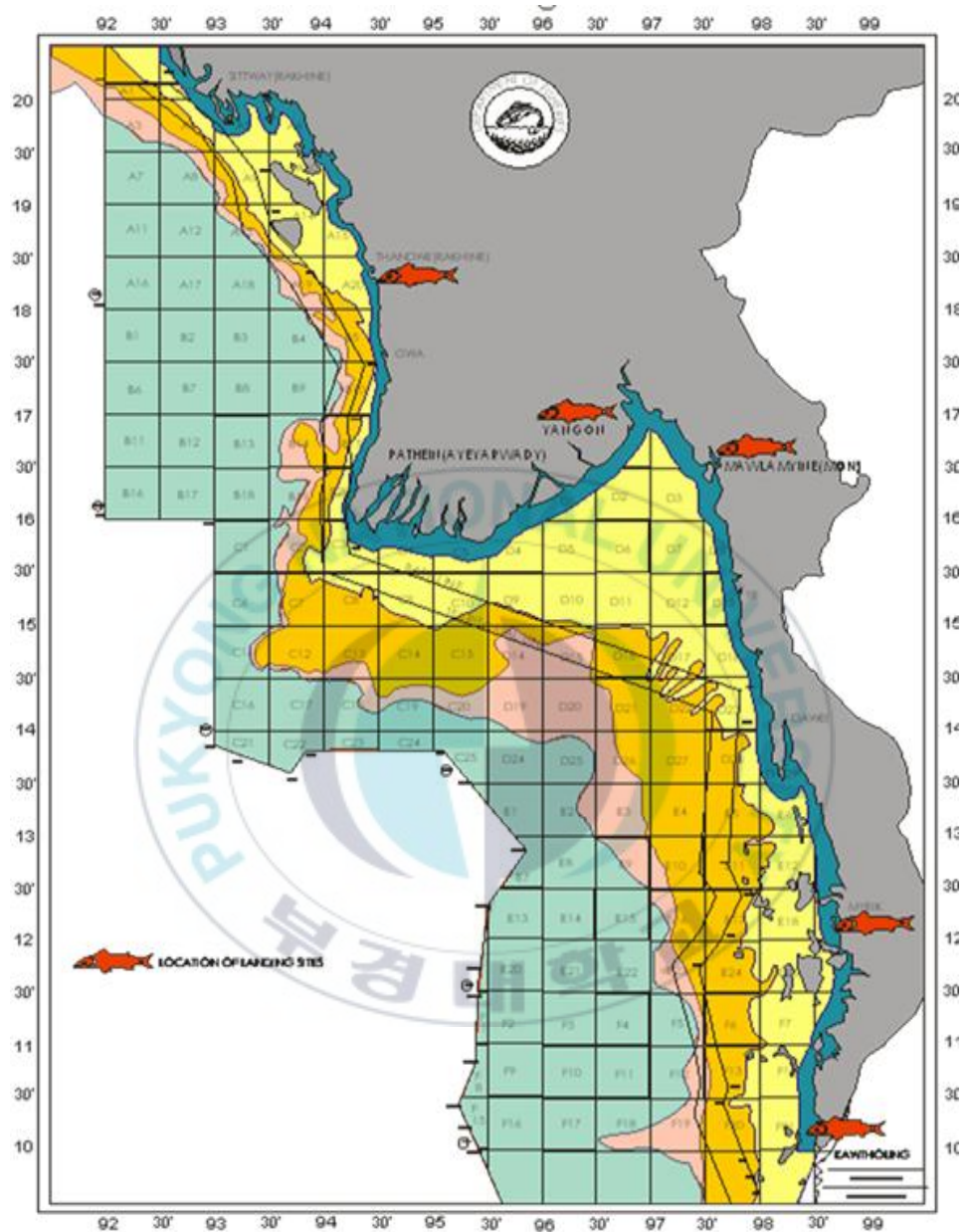
There were three reasons why such demarcation was needed. The first reason was shrimp food was formed there. Another reason was that trawlers would be likely to destroy shrimp seeding when they went out to fish in these areas. The third reason was that used to have conflicts with the native there.<sup>9)</sup>



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9) Fishing Industry of Myanmar 1997.





Source: Department of fisheries fishing Grounds of Myanmar and Landing sites.

[Figure 2] Fishing Zones in Myanmar



## 5. Act for Permission Regarding Foreign Fishing Vessels

The act allows foreign fishing vessels to be able to engage in Myanmar seawater with the fishing right following the changing system of the market of the State.

A foreigner owning a vessel registered in a foreign country or his representative may apply for permission to operate a fishery in the Exclusive Economic Zone in any other fishing area if there is any special reason. Requirements after submitting a prescribed application form to the Fisheries Department are License fee, tax on fresh fish, regarding the vessel, the course on the sea with day, date and time, kind of implements and list of persons aboard the vessel should be included in the report in advance as required by the department.

The flag of Union of Myanmar and the flag of the country of vessel registration must be hoisted while the vessel is sailing on Myanmar Waters. Every time the vessel enters or leaves Myanmar fishing areas the vessel must be presented for inspection at the port assigned to by the Fisheries Department. If the grant of rental or tender license is withheld or withdraws for the benefit of the State, a natural danger prevailing in the site of fisheries or if there is any reason that affects production, the refund may be applied for following the ways prescribed by the Department of Fisheries. No foreign vessel allowed to fish shall go against any



of the prohibitions mentioned in the license, permission or elsewhere. Inspectors may be appointed by the Director-General of the Fisheries Department.

Finance and Revenue Minister's Custom Department, Infantry or Navy personnel may be assigned to carry out the inspection. If a foreign fishing vessel is found to go against vessel, implements and fish's inspection or violate prohibitions by law, the lawbreaker will be brought to the nearest court and the vessel, implements, and fishes will be confiscated. Director-General of the Fisheries Department has full authority to deal with such matters, but if the law barker is not satisfied with the Director-General's order decision, he can go up to Minister of Livestock and Fisheries within 30 days of receipt of the order or decision for an appeal. The Minister may confirm, cancel or modify the Director General's decision or order. The Minister's decision is final.

When law violators are used by inspectors at the court, they will be given punishment provided by the Fisheries Law, foreigners receiving punishment must pay their fines in foreign currency.

## **5.1 Myanmar Marine Fisheries Act**

State Law and Order Restoration Council has enacted Myanmar Marine Fisheries Law so that the State Economic Organization can operate joint venture marine fisheries with foreigners and Myanmar can operate either joint venture marine fisheries with



foreigners or domestic marine fisheries systematically.

Myanmar Fisheries Waters mean water between estuaries and Exclusive Economic Zone. Onshore fisheries, offshore fisheries, Joint Venture fisheries, collecting and marketing marine products and fishing for a hobby can be operated following Myanmar Marine Fisheries Law. Those wishing to operate onshore fisheries are required to apply for the license at the township level and those intending to operate offshore are required to go up to Director-General through Head of Division. Applicants for offshore fisheries are required to submit a photograph of the vessel, registration paper for the vessel, document to prove the ownership of the vessel and a statement signed by the applicant that he understands and agrees that the vessel together with the fish and the implement will be confiscated by Myanmar Government.

If certain foreigners, overseas organizations or foreign countries other than those included in the agreement are found to be involved in the fisheries, the vessels with the implement and the products will be confiscated for the State. Foreigners applying for the permit's fisheries must sign the agreement containing the above clause. Joint Ventures must obtain permits from the Director-General and pay the tax in foreign currencies. Those wanting to build fishing vessels in Myanmar country must attach a blueprint or a photograph of the prototype, import and export license, company registration card to their application stating size and shape or design of the vessel, engine power, capacity and



kind of business to do with the vessel after completion.

If a person is employed aboard a fishing vessel, he must register himself at the township office of the Department of fisheries to obtain the registration card for the job. Anyone employed aboard a fishing vessel without such a card is punishable by Myanmar Marine Fisheries Law.

Inspectors appointed by high authorities may be army and navy personnel. The duty of the inspectors and those assigned by the Director-General have to act on lawbreakers. Their vessels with the implements and themselves will be taken to a court where proper punishment in the way of confiscation of the State will be carried out. The Director-General makes decisions for the cases brought to him and the minister concerned may accept appeals and the minister's decision is final just like charging lawbreakers in another type of Fisheries.

Regarding Director-General's part, the fixes time to operate specifies an area of operation, kinds of fishes that the operator is allowed to catch and implement that can be used. The Director-General has full power to delay, withdraw or cancel a license because of certain reasons. He can change original rules and regulations for fishing, and he can also change the fishing area that was originally assigned to the license.<sup>10)</sup>

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10) Marine Fisheries Law 1990 /as amended in 1993.



## 5.2 Freshwater Fisheries Act

Freshwater fisheries carried out in ponds, reservoirs, river systems and other bodies of water lie between Myanmar coastlines and land boundaries where fisheries may inhabit and reproduce are subject to the Freshwater Fisheries Act, Leasable Fishery, Reserved Fishery, Reservoirs where fisheries are allowed with license, any land lying within a government department estate, inundated areas, water on an island, nests, and pits where turtles and crocodiles lay their eggs and brackish water found outside the line drawn from one point of the estuary to another point on the opposite bank are all included.

Anyone wishing to operate freshwater fisheries may obtain a license at the auction and the full rent will have to pay in cash. All freshwater fisheries except leasable ones can be operated by depositing license fees for fishing implements, by obtaining a tender license or silence that may be issued after submitting the price list with sealed tender. Auctioning Leasable and issuing tender licenses for freshwater fisheries other than leasable are done in April and May every year.

If there is any foreigner is living in a foreign country who wishes to operate freshwater fisheries in accordance with Myanmar Investment Law or if there is any person organization willing to pay in foreign currency for the operation of freshwater fisheries, rental or tender license will be issued and the rents,



tender fees, and license fees will be collected in foreign currencies.

A lease grant of a license is issued only after inspection for agreement with the specification was done. An order for import and export of live fishes may be issued in advance after checking the application submitted to the Director-General of the fisheries department.

People wishing to be engaged in fish and shrimp culture may carry out the work only after paying the tax due. As for the equipment they can get an exemption. Inspectors appointed by the authorities concerned may inspect the fish and shrimp culture to see if everything is done in accordance with the Law and Acts. If a person is found to have violated the Law, the Director-General of the fisheries Department may confiscate the fishes, equipment, and pond. The person will be taken to a court for punishment provided by the law. If that person is not satisfied with the Director-General's decision or order, the Minister's decision is Final.<sup>11)</sup>

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11) Freshwater Fisheries Law and Order Restoration Council Law No. 1/91, 1991.



### III. Fisheries Domestic Distribution and Export Status

#### 1. Foreign Investment in Myanmar Fisheries (Since 1988)

In Myanmar, the government has formed the Union of Myanmar Foreign Investment Commission (FIC) by Notification Number 12/88 dated December 7, 1988. Like some other Southeast Asian nation, FIC of Myanmar mainly reviews investment proposals to issue permits. The commission may accept any proposal which in its opinion will promote the interest of the state without prejudice to any existing law. It permits economic organizations to open foreign currency account as well as kyat account and their financial transaction in the bank. It also can decide on the suitability of the projects, review extensions and may also evaluate the performance of the enterprise. The commission that is FIC deem at any time on evidence of facts of investor's furnishing operations. It may result in deterring some investors as they would not like to disclose their firm's confidential or secret information.<sup>12)</sup>

Nonetheless, global economic integration has increased the inflow of FDI to many countries and has embraced all economic

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12) Byung Min, Attracting FDI, 2010.



activities. Global integration will continue to desire FDI flows, whenever the economic environment is opened. Globalization will increasingly blur the distinction between foreign and domestically owned enterprises, and between developed and developing countries.<sup>13)</sup> Countries that have opened to foreign investments stand to share in the rising global prosperity that globalization brings.<sup>14)</sup> Thus, in Myanmar, foreign capital plays an important issue in the economic development process. She also has well realized the need to boost investment to expedite the pace of development and to strive for export promotion. Hence, such foreign investments that meet these criteria have been warmly welcomed.<sup>15)</sup>

There has been hoped for economic development in Myanmar with her strategic location, economic environment and rich natural resources particularly fishery resources within the South East Asian region. Myanmar has a great tendency for economic and investment mobilization, as she is strategically located in Southeast Asia and bordering with Bangladesh, China, India, Laos, and Thailand. She stands at the crossroad among these countries. Besides her English-speaking efficiency, a legacy of the former British Colonial rule has meant the existence of a legal system and a framework for business and accounting that are familiar to international investors. The government of Myanmar has

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13) Mya Than, Myanmar Dilemmas and Option, 1990.

14) FDI No 5, 2010.

15) Byung Min: Attracting FDI 2010.



encouraged the use of resources and the plentiful supply of land for agriculture, livestock and fisheries activities, downstream processing in food and non-food light manufacturing.<sup>16)</sup>

Myanmar has a long coastline and fishing grounds in its waters. They are less exploited places the offshore fishing grounds have been the least exploited. Hence, vast plentiful land and sea have always existed.<sup>17)</sup> Nowadays, offshore fishing has become an important economic sector in many countries. Fish is an important item for both food and income for many people, especially in developing countries.<sup>18)</sup>

On the other hand, because of an open-access fishing business, fishery management has become important. Clash of interest of fishermen or individual fishing units and the national economy has been arising. In an open-access fishery, individual fishing units which are motivated by the private profits operate to the point of attaining the highest level of profits. This brings to the clash of interest, of national economies of many countries. Thus, issues in fishery management have become the concern of many state and government. Together with these issues are the social and political problem which arise as byproducts of the fishing business. Governments must intervene in such cases as an employment problems in many industries, the distribution of income between them and even in the sharing of economic rent and playing the

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16) Myanmar Trade and Investment Potential in Asia 1996.

17) Byung Min: Attracting FDI 2010.

18) Fisheries and Food security, "world Food Summit" Rome FAO, 1996.



role of the state economy. The granting of EEZ by coastal governments to foreign companies also gave more authority to the former. Thus, it is not wrong to say that once which seems not to be a so important department, fishery work has now increased in importance both in the international and domestic arenas.<sup>19)</sup>

Marine fisheries can be subdivided into onshore, inshore and offshore fisheries. Onshore fisheries are the marine fisheries that exist in the tidal mudflats and swamps caused by ebb and flow. It is exploited by small scale fishermen with indigenous catching mechanisms. Inshore fisheries are in the shallow areas within 10 miles from shore or the area where the shore is visible and the duration of fishing time within a day. The area is mainly exploited by artisanal and small-scale fishermen using locally constructed small powered or un-powered vessels. Of these fisheries, the least exploited are offshore fishing grounds, especially in the deep sea which are beyond the visibility of shoreline or 10 miles offshore. Thus, the potential for marine fisheries is quite promising and there is much room for further development.<sup>20)</sup> For this reason, the Ministry of Livestock Breeding and Fisheries granted fishing rights to many foreign fishing vessels. From 1988 to 1990, among the operating fishing vessels owned by various foreign companies, Thailand stood first with the largest number of vessels of 217, Malaysia was the second several 40 and Singapore, the third with

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19) Ibid.

20) U Win Htin & Dr Nyan Taw 1985: "Status of Fisheries In Burma" Bangkok, 7-18.



12 vessels.<sup>21)</sup> This transnational fishery relations seem to bring benefits for both host country and investing countries. But the nature of most of the fishing activities have been involved only in trading and not in production.<sup>22)</sup> The importance of the fishery sector for any country is a known fact by all countries of the world. Myanmar has therefore tried to grasp the offering by other countries. In the fulfillment of her national economic objectives, the first step is to grant fishing rights to her neighboring foreign companies. The importance of fisheries can be seen in many aspects, such as their capability to contribute to gross domestic products, foreign exchange earnings, domestic nutritious employment and effects of their output in other industries, known as 'linkage effects'.<sup>23)</sup> Following the national objectives of Myanmar in building a modern developed nation, the fishery sector has, therefore, helped fulfill these national objectives as much as it could. For these reasons, the Ministry of Livestock breeding, and fisheries have started to grant fishing rights to foreign companies just after the reforms in September 1988. In 1989-90, among the foreign fishing companies in Myanmar, there were 13 companies enjoying fishing rights with license fees while six companies were operating as Joint Fishery Development Program with Myanmar Fishery Enterprise (MFE). These can be illustrated by the following table.

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21) Status of Livestock and Fisheries, 1994.

22) Lawson: Economic of fisheries.

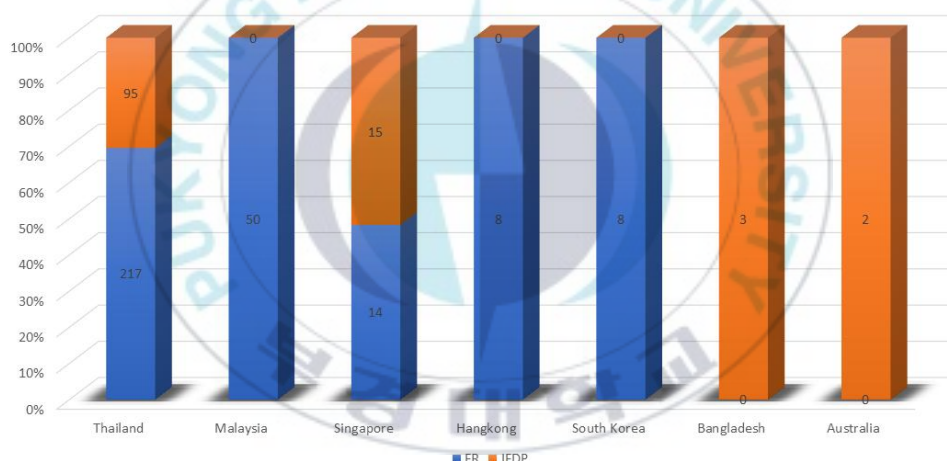
23) Lawson: Economic of fisheries.



<Table 4> Foreign fishing companies allowed to fish in Myanmar

No	Country	No. of Company	No. of Vessels		Total
			FR	JFDP	
1	Thailand	7	217	95	312
2	Malaysia	2	50	–	50
3	Singapore	4	14	15	29
4	Hongkong	1	8	–	8
5	South Korea	3	8	–	8
6	Bangladesh	1	–	3	3
8	Australia	1	–	2	2
Total		19	297	115	412

Source: Creation of author after data from Kyaw & Su: Present Status of Fisheries.



Note : JFDP - Joint Fishery Development Program, FR - Fishing Rights.

Source: Global Corruption Report 2008.

[Figure 3] Illustration of foreign fishing companies allowed to fish in Myanmar

According to the above illustration, fishing vessels and JFDP vessels operating in Myanmar start from in 1989-90, Thailand has had the largest number of vessels, Malaysia is the second and Singapore the third. The majority of these fishing vessels were



from Southeast Asian countries.

## **2. Examples of foreign company investors in (marine) aquaculture**

There are few foreign marine aquaculture investors established in Myanmar. In freshwater aquaculture, there are possibly more 'hidden proxy' investments made through local companies. This is not different from several other SE Asian countries, as the legislation sometimes is very restrictive towards foreign investors such as in Thailand. Tropical marine aquaculture is still not considered an investment object, as investors have no documentation that it can be successful.

Following FDI companies were encountered during the mission:

- A Japanese JV pearl oyster company in Tanintharyi region. It started in 1962-63 but was nationalized by the military regime and is now operated by the local 'partner'.
- A Korean company MSC started in 2008 with a production of *Eucheuma/kappaphycus/gracilaria* in a buy-back arrangement with local fishermen. This is a 100% FDI company given permitted directly by the Minister during the military regime
- Thai CP group has a JV with PPT in Myeik for the production of white leg shrimp in 100 ha ponds.
- Depuis is building a livestock feed mill planned to open in 2017. They import the aqua-feeds from their factory in Vietnam. There is no information if they have a local partner.



- Texchem food Sdn Bhd (Malaysia) has a JV with Mascot Industries co. ltd (Myanmar) within seafood processing since 2003. The mother company Texchem Ltd (chemicals) established already in Myanmar in 1997. Texchem Marine Labutta Ltd is a new 2015 JV also with Mascot Industries for soft shell crab production, likely it is a continuation of an existing Malaysian invested soft shell crab farm near Yangon with the brand name Crab World.
- Green Feed Vietnam Corp. together with Fisheries and Feed Development Public Company are building a livestock and aqua feed mill in Yangon in a JV.
- KOSPA ltd is a cold chain logistics service provider. They have cold storage and refrigerated trucks, transporting seafood, etc. It is a JV between Yoma Strategic Holdings Ltd (Myanmar) and Kokubu & Co. (Japan).
- Aller Aqua, the Danish feed mill is considering seriously making a feed mill in Myanmar. Partner unknown if any.<sup>24)</sup>

### 3. Distribution Structure

Distribution networks in Myanmar are fragmented and unreliable outside metropolitan areas. This is changing with the entry of international general and specialized logistics services. The majority of the retail market is comprised of small and

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24) Global Corruption Report 2008: Corruption in Water Sector.



medium-sized businesses. Yangon is the major distribution center for goods imported by sea and air. Mandalay is the distribution hub for upper Myanmar, especially for goods imported by land from China and Thailand. Yangon International port terminals handle approximately 90% of the country's legal imports and exports and 3 Inland Container Depots (ICD) has a combined capacity of more than 15,000 twenty-foot equivalent units (TEU). Today, the maritime cargo traffic of Yangon Port has climbed to more than 24 million tons per year.<sup>25)</sup>

Distribution of fish from San Pya (central fish market) to other areas of the country takes place primarily by train, by truck and public express bus. Transport workers at San Pya reported that a total of 12 twelve-wheel trucks made long-distance deliveries of fish to Nay Pyi Taw and Mandalay on a daily basis (six to each destination), with additional trucks of a similar size making deliveries to other states and regions. Ten years previously, out of state deliveries were made by six-wheel vehicles with approximately two-thirds of the capacity of those operating at present - 6000 vises (9.6 t), versus 10,000 vises (16 t). Five years ago, only one truck delivered fish to Nay Pyi Taw each day. Trucks sending fish along these routes carry dry goods on their North-South journey and typically deliver fish to four to five customers on the return journey, dropping off at several markets along the way. Vehicle owners come both from Yangon and other

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25) U.S Country Commercial Guides, 2018.



parts of the country. Owner-operators of a further 50 small (six-wheel) trucks were reported to offer delivery services from San Pya to cold storages and processors located in industrial zones in and around Yangon, and to the Aung Mingalar Bus Terminal. Fish deliveries from Yangon to the rest of the country by express bus began in 2011.<sup>26)</sup>

Before 1990, the delivery of fish outside of Yangon was not legal, the food security of the then capital city being prioritize over that of the rest of the country. After this time, 53 licenses were granted enabling wholesalers to export fish to other parts of the country. License conditions stipulate the amount of fish that can be traced to particular destinations, and license holders are required to report the quantities they deliver and to obtain a letter of permission from DOF for every delivery, allowing them to transport a specified category of goods on a specific route. These restrictions are ineffective. Registered traders deliver quantities of fish over their allowable quotas, and unregistered traders deliver fish interstate illegally. One informant indicated that if trucks carrying fish without permission were stopped, the matter could be settled for a small “unofficial fine” of USD 1.50. However, another noted that unauthorized interstate deliveries of fish could be confiscated and sold at auction if found during inspections by DoF at toll gates entering destination cities, making it important for a

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26) DOF. 2012. Statistics of Exported Fish and Fishery Products from Myanmar [2010-2011] & [2011-2012]. Nay Pyi Taw: Department of Fisheries, Ministry of Livestock and Fisheries).



trader to maintain “good relations” with its officials.<sup>27)</sup>

The demand for fish is growing faster worldwide. The fishing sector has, therefore, become significant not only in interstate also in international relations. For 22 out of 118 countries, fish represent over 40% of the total direct consumer demand for animal protein. Twenty countries consume over 30 Kilograms per person per annum. These countries range from Japan to Ghana. About 35 countries, both rich and poor, consume about 5 kg per annum by every person. The majority of fish used for human consumption is frozen, though almost is sold fresh. Of the world total catch, about 70% is used for human consumption and the remainder is diverted into manufacture for fish meals and fertilizer.<sup>28)</sup> In 1997, per capita consumption of fish in Myanmar was 18 kilograms while their meat consumption was 6.2 kg. According to FAO estimations, global per capita consumption of fish in low-income food-deficit countries and South Asia was only 9.2 and 4.4 kg per year.

Using estimates based on the inland fisheries areas (6 million ha of a floodplain, 1.3 million ha of permanent water) of Myanmar the national per capita figure could range between 26–34 kg per capita year. Thus, the status of Myanmar capita fish consumption is not lower than the global standard.<sup>29)</sup>

The demand for developing countries for luxury species such as

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27) Value change transformation, fish and food security in Myanmar, 2015.

28) Rowena. M. Lawson: Economics of Fisheries Development, New York, Preager Publisher, 1984.

29) Status of Livestock and Fisheries of the union of Myanmar. 1989, 2018, DoF.



shrimp, lobster, prawn, and tuna has increased vastly over the last thirty years. Developing countries are a notable trader in these luxuries' species with shares of over 50% world trade respectively. Demand for such luxurious species in developing countries continues to grow day by day. Demand for many other species, however, depended to some extent on marketing, presentation, and packing since domestic consumer demand is increasing day by day.<sup>30)</sup>

#### 4. Changes in Fish Price by Region

Fish represent a cheaper source of micro-nutrients than other animal source foods (Figure 4). The price of fresh fish was 35% lower on average than that of meat in 2010. Other than milk (consumption of which was negligible), fermented fish and shrimp products were by far the cheapest animal source food. Freshwater capture fish were moderately cheaper on average than marine capture fish, while fish from aquaculture were, on average, marginally more expensive than those from marine capture. This underlines the point that while farmed fish is cheaper than eggs and all meats, it may still be less accessible to the poorest consumers than fish from other sources.

The unit price of dried fish is more than double that of fresh fish, but this price differential reflects water loss during the drying process, which makes it a concentrated source of nutrients,

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30) Lawson: Economics of Fisheries.



representing good value for money despite the high normal price. Fish prices vary widely across the country, reflecting transportation costs, differences in supply, and localized consumer preferences. In general, prices are lowest closest to the point of production and highest in the areas most distant. Thus, the overall trend is for lower prices in West, Lower and South Myanmar, where the majority of capture fisheries and aquaculture production occurs. East Myanmar has both the lowest levels of fish consumption and the highest prices for fish in all categories.<sup>31)</sup>

The lowest prices for fish of all types are found in West Myanmar, comprised of Chin and Rakhine, the two states with the highest poverty incidence. Although Rakhine has a large marine capture fishery, this cannot account for the low prices of farmed and freshwater capture fish consumed there. This result can be attributed to a tendency for poor consumers to eat the cheapest of fish available, from all sources.<sup>32)</sup>

The real price of snakehead (freshwater capture) and hilsa (marine capture) increased by 2.9% and 5.2% per year on average over the period 2008-2014 respectively, whilst the real price of the main farmed fish, rohu, fell 0.5% per year. Among 10 common fisheries products analyzed, the real price of eight out of nine originating entirely or predominantly from capture fisheries increased faster than the rate of inflation (Table 5).

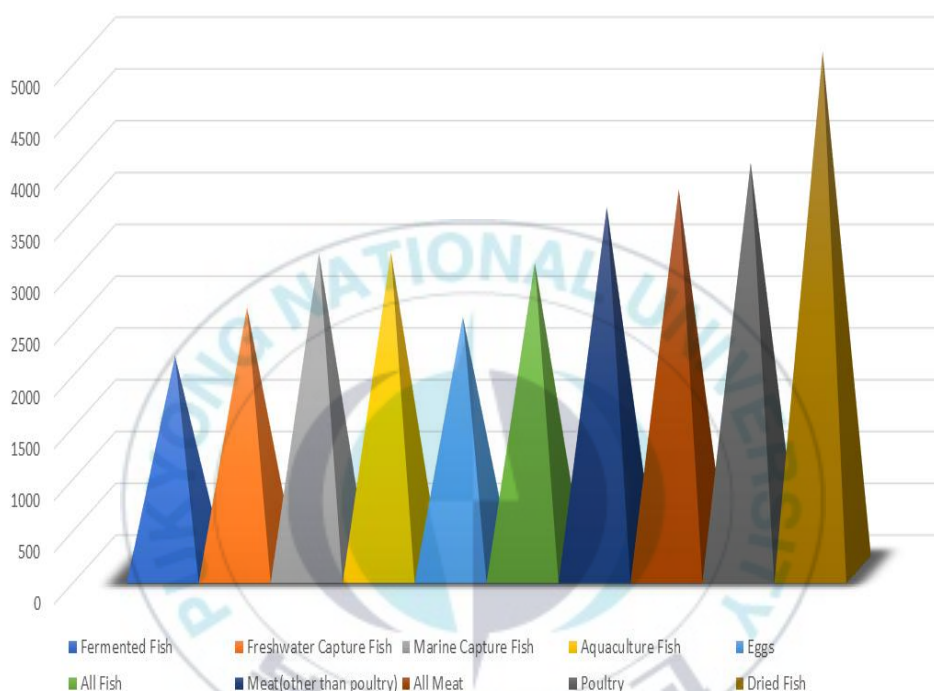
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31) Sena S. De Silva, *Aquaculture Successes in Asia: Contributing to Sustained Development and Poverty Alleviation*, 2010.

32) IHLCA, 2011.



Similar long-term trends in real fish prices, as a result of declining capture fisheries productivity or production relative to demand and rapidly expanding aquaculture, have also been reported in neighboring Bangladesh.<sup>33)</sup>



Source: Myanmar daily wholesale price.

Unit - Kyat / kg

**[Figure 4] National median prices of animal source foods**

33) Toufique, K.A. and Belton, B. 2014. Is Aquaculture Pro-Poor? Empirical evidence of impacts on fish consumption from Bangladesh. World Development.



<Table 5> Annual changes in the real price of animal source foods,  
2008–2014

(Unit: Kyat)

Origin	Fresh capture			Marine capture			Aquaculture			
Product	Nga yant	Nga Yant (Dried)	Nga Ku	Nga gyi	Pazun doke	Nga pi ye (fish)	Nga thalauk	Pazun kyawt	Nga pi ye (Shrimp)	Nga Myint chin
Annual price change (%)	2.94	4.45	1.20	1.67	3.19	1.43	5.20	3.77	-2.82	-0.47

Source: CSO, various years

(Unit: Kyat)

Livestock farming		
Pork	Chicken	Eggs
0.91	1.77	-1.94

Source: CSO, various years.

The real price of chicken meat and eggs which, like rohu, are produced in large volumes by a rapidly growing commercial farm sector, fell by an average of close to 2% per year over the same period. These figures indicate that aquaculture will have an increasingly important role to play in Myanmar's future fish supply, as the only fisheries sub-sector with the potential to expand production sufficiently rapidly to avert real price increases.



## 5. Marketing

### 5.1 Central wholesale markets

Most fish ponds in Myanmar lie within a 50km radius of the capital, Yangon. Myanmar's largest fish wholesale market, San Pya, is located in Yangon, on the river which marks the city's western boundary and provides the main transport link to pond clusters located in the zone around the city. The vast majority of farmed fish produced in this zone are traded through San Pya. San Pya was established in 1991 and is administered by the Markets Department of the Yangon City Development Committee(YCDC). The market operates daily, from late night until mid-morning.

A second fish wholesale market, Shwe Padauk, opened in Yangon in October 2014, further north than San Pya, on the Yangon River. Shwe Padauk was privately constructed on land belonging to YCDC, and it is envisaged that it will partially replace San Pya market, which is located in a congested residential area. However, at present only a relatively small fraction of the fish traded in Yangon passes through Shwe Padauk. Both markets trade fish from aquaculture and capture fisheries. Informants estimated that farmed fish accounts for 65-70% of the fish traded at San Pya, and around half traded at



Shwe Padauk. Fish that passes through the two markets are distributed throughout the Yangon area, to the country beyond and abroad.<sup>34)</sup>

## 5.2 From farm to market

Farmers can sell fish to Yangon in one of two ways: 1) through local collectors, and 2) directly to traders at San Pya or Shwe Padauk. Collectors are present in all major aquaculture clusters. They can provide harvesting services or purchase fish already harvested and may either buy fish to resell to larger traders in Yangon or earn a commission through brokering sales on farmers' behalf. Collectors tend to provide this to service smaller farms because large traders in Yangon will only arrange collection of fish from farms if the quantity harvested exceeds 10,000 vises (16 t; the capacity of a small collecting boat). Some small producers choose to sell direct to wholesalers in Yangon using their own or hired transport, receiving a better price than if selling through collectors, but incurring transport costs.

Most of the farmed fish traded through Yangon markets are sold without the involvement of an intermediary. Farmers who have taken advances from fish traders are bound to sell all their fish through those traders. Those who are not indebted to traders are free to choose to whom they wish to sell, but often opt to work with one or a small number of trusted individuals. Farmers

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34) Aquaculture in Transition 2015, Value change Transformation,



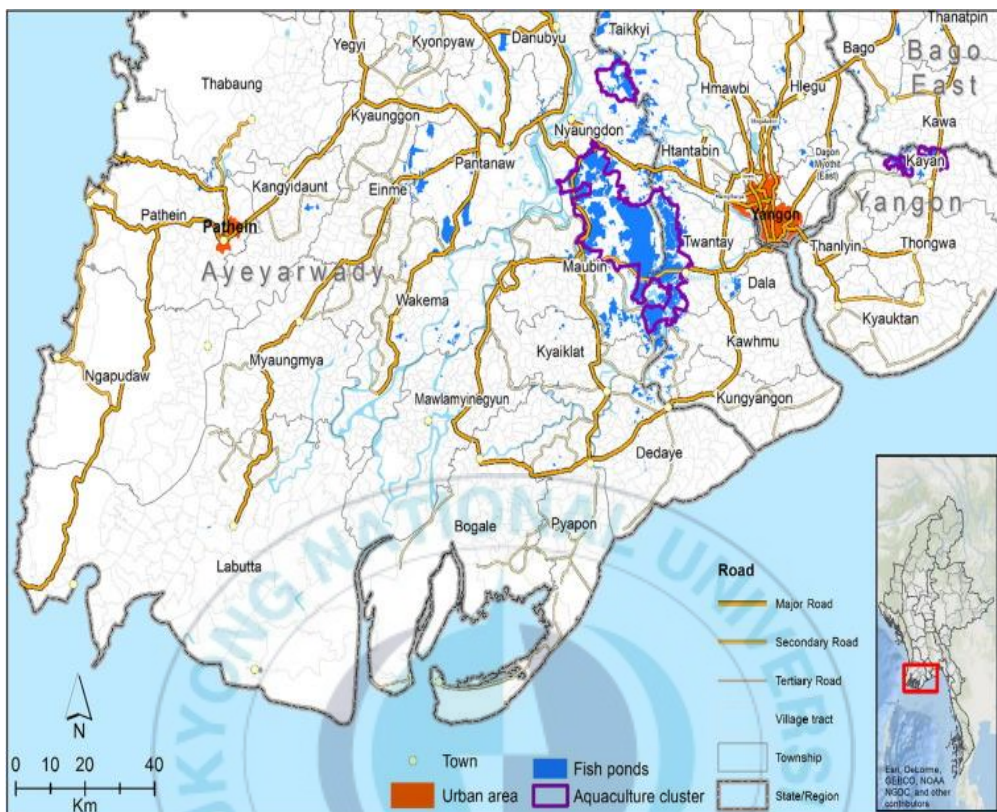
usually inform the trader several days in advance of the harvest to set a date agreeable to both parties and receive payment from traders at the time of sale or after a delay of a few days.

When fish are harvested, they are packed in crushed ice in the hulls of collecting boats or in un-refrigerated trucks. Boats are the main form of transport because many ponds are accessible only by the canal, and account for as much as 80% of the volume of fish deliveries to San Pya. Refrigerated trucks are also occasionally used to transport fish to the market, particularly by the largest farms. Workers collecting parking fees from trucks delivering fish to San Pya reported that the number of trucks making deliveries to the market had doubled within the past 10 years. Yangon traders and larger farms own boats or trucks for transportation purposes, and transport rental services are widely available from vehicle owners located close to wholesale markets and in aquaculture clusters. Traders may supply ice, deducting the costs from the sales price, farmers with their transport may collect their ice before harvest, or owners of rented vehicles may supply it as part of their service. Ice is the source from ice plants located in Hlaing Tharyar industrial zone, or from plants in towns close to major aquaculture clusters. There is a total of 106 ice plants in the Yangon region (DoF,2014), and 15 businesses at San Pya that specialize in crushing ice blocks.<sup>35)</sup>

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35) Ng, W. K, Soe, M., Phone, H.2007. Aquafeeds in Myanmar: A change from farm-made to factory-made feeds. Aquaculture Asia Magazine





Source: Resilience through risk management: cooperative insurance in small-holder aquaculture systems.

[Figure 5] Fish ponds in lower Myanmar

### 5.3 Regional wholesale markets

Long-distance trade between San Pya and regional wholesale markets is usually conducted by telephone, with certain wholesalers specializing in dealing with markets in specific geographical locations. Some traders in regional wholesale markets work with family members based in Yangon to assemble and dispatch orders, while others receive fish through brokers at San



Pya working on a commission basis, and some deal directly with wholesalers. Larger buyers may send their transport to collect fish from San Pya (particularly if they also have fish to sell in Yangon), while others rely on the sender to make delivery arrangements. Payment for these orders is usually made by bank transfer. Informants estimated that 40–50% of the fish traded at San Pya was destined for domestic markets outside Yangon.

The customer base in regional wholesale markets is comprised of retailers and semi wholesalers (large retailers who sell part of their stock to other smaller retailers) from wet markets and smaller urban centers in the surrounding area. Semi-wholesalers from these locations often travel to the nearest urban wholesale market to assemble orders on behalf of groups of small retailers.<sup>36)</sup>

## **5.4 Retail**

There are several domestic supermarkets and modern chain restaurants each operating multiple outlets in Yangon, but at present these cater primarily to middle-class consumers, and there are currently very few of these stores outside the city, where the retail sector continues to be comprised almost exclusively of wet markets.

A sizable majority of retail fish traders are women. Retailers and semi-wholesalers from Yangon and the region surrounding it (e.g. towns in southern Bago), visit Yangon wholesale markets

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<sup>36)</sup> Introduction to Business, Report April 2014.



daily to buy fish, often using transport rented collectively with other traders from their area to do so. Larger semi-wholesalers may have their transport. At San Pya, these customers move from wholesaler to wholesaler, selecting fish in the combinations they require. Retailers and semi-wholesalers in regional wet market outside of Yangon operate similarly; purchasing fish from wholesale traders in spot transactions based on the selection and price of fish offered, and making payment in cash immediately, or taking very short term credit (usually one or two days), or some combination of cash and short term credit.<sup>37)</sup>

Retailers in wet markets can be divided into those who trade from a licensed stall, and those who have no fixed location from which to trade. Licensed stalls are usually constructed of wood and elevated from the ground and are accessed by purchasing a license from the authority controlling the market, or by renting space from an existing license holder. Unlicensed retailers normally vend produce within or close to the market from a plastic sheet, tarpaulin or basket laid on the ground. The former type of retailer usually trades quantities of up to 100 vises 160 kg per day, whilst the latter may sell from less than 10 vises to 50 vises or more. In rural markets, the smallest unlicensed retailers often sell freshwater fish caught by their family members or neighbors. A typical market will include considerable numbers of both types of trader (perhaps totaling 50 or more in a busy market), with

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37) Sena S. De Silva, *Aquaculture Successes in Asia: Contributing to Sustained Development and Poverty Alleviation*, 2010.



unlicensed traders usually in the majority. Retailers selling largely farmed carps sell intestines and swim bladders obtained when cleaning fish to commercial buyers, who use them, respectively, for the production of edible oil, and for drying for export to China.<sup>38)</sup>

## 6. Export

Officially recorded exports of fish from inland aquaculture began in 2004, with a small quantity of rohu exported to Bangladesh. Nine years later, in 2012, total reported exports had reached 386,981.324 metric tons, worth a reported USD 653.850 million.<sup>39)</sup>

Yangon Division fishery department has handled the export of fisheries products. It is including freshwater fish and shrimp products from rivers, creeks, streams, ponds, and inns, marine water fisheries products from Rakhine State, Ayeyarwady Division, Tanintharyi Division fishing ground, and other products. Some pond-fishes come from Kayin State. Mostly, fisheries products are exported by steam and air from Yangon.<sup>40)</sup>

The exported amount of fish and fishery products was 0.57 million metric tons and the value of which was USD 711.72 million in 2017–2018. It was exported to 46 different countries. The

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38) Kubo, K. Trade Policies and Trade Mis reporting in Myanmar. IDE Discussion paper No. 148. Chiba. Institute of Developing Economics (IDE), JETRO), 2012.

39) DoF, 2012.

40) Fishing Industry of Yangon Division, Report, 1983.



exported amount was 10% of the total production of fish in Myanmar in this period, 2017-2018.

There are two types of export in the fisheries sector:

Border Trade ⇒ Kawthaung, Myeik, Myawaddy ⇒ By Ship

Normal Trade ⇒ Yangon ⇒ By Air





<Table 6> Monthly data for fisheries export of Myanmar (2017-18/2018-19)

Unit - USD Million ( MT)

DATE	Year	Fish		Prawn		Other		Total	
		MT	US\$	MT	US\$	MT	US\$	MT	US\$
APRIL	2017-2018	24392.976	23.641	763.058	2.95	12618.54	18.249	37774.574	44.84
	2018-2019	39257.794	31.86	1075.163	3.383	16478.075	23.275	56811.032	58.518
DIFFERENT		14864.818	8.219	312.105	0.433	3859.535	5.026	19036.458	13.678
MAY	2017-2018	15957.719	18.939	960.892	3.814	11755.34	20.208	28673.951	42.961
	2018-2019	29267.023	27.236	1253.61	4.866	15540.919	24.827	46061.552	56.929
DIFFERENT		13309.304	8.297	292.718	1.052	3785.579	4.619	17387.601	13.968
JUNE	2017-2018	17744.893	20.399	1350.62	5.963	9102.4751	17.961	28197.9881	44.323
	2018-2019	12219.572	14.093	1055.537	5.133	7367.901	14.627	20643.01	33.853
DIFFERENT		-5525.321	-6.306	-295.083	-0.83	-1734.5741	-3.334	-7554.9781	-10.47
JULY	2017-2018	20295.848	23.018	1176.675	4.74	7296.057	15.853	28768.58	43.611
	2018-2019	15657.15	18.223	1043.913	4.947	7717.948	15.944	24419.011	39.114



DATE	Year	Fish		Prawn		Other		Total	
		MT	US\$	MT	US\$	MT	US\$	MT	US\$
DIFFERENT		-4638.698	-4.795	-132.762	0.207	421.891	0.091	-4349.569	-4.497
AUGUST	2017-2018	29892.567	31.985	1504.667	6.702	7728.169	16.726	39125.403	55.413
	2018-2019	20719.081	24.048	1395.73	6.329	8439.326	15.219	30554.137	45.596
DIFFERENT		-9173.486	-7.937	-108.937	-0.373	711.157	-1.507	-8571.266	-9.817
SEPTEMBER	2017-2018	36034.909	36.92	1674.141	6.186	10070.468	20.254	47779.518	63.36
	2018-2019	30682.007	33.663	1382.972	5.72	10520.749	20.133	42585.728	59.516
DIFFERENT		-5352.902	-3.257	-291.169	-0.466	450.281	-0.121	-5193.79	-3.844
OCTOBER	2017-2018	34856.828	35.225	1560.725	6.259	12252.371	22.443	48669.924	63.927
	2018-2019	40948.064	39.264	1387.275	5.54	18674.332	29.943	61009.671	74.747
DIFFERENT		6091.236	4.039	-173.45	-0.719	6421.961	7.5	12339.747	10.82
NOVEMBER	2017-2018	39718.646	38.678	1408.85	5.657	14661.399	23.085	55788.895	67.42
	2018-2019	42006.279	42.633	1431.497	5.707	19429.625	27.665	62867.401	76.005
DIFFERENT		2287.633	3.955	22.647	0.05	4768.226	4.58	7078.506	8.585

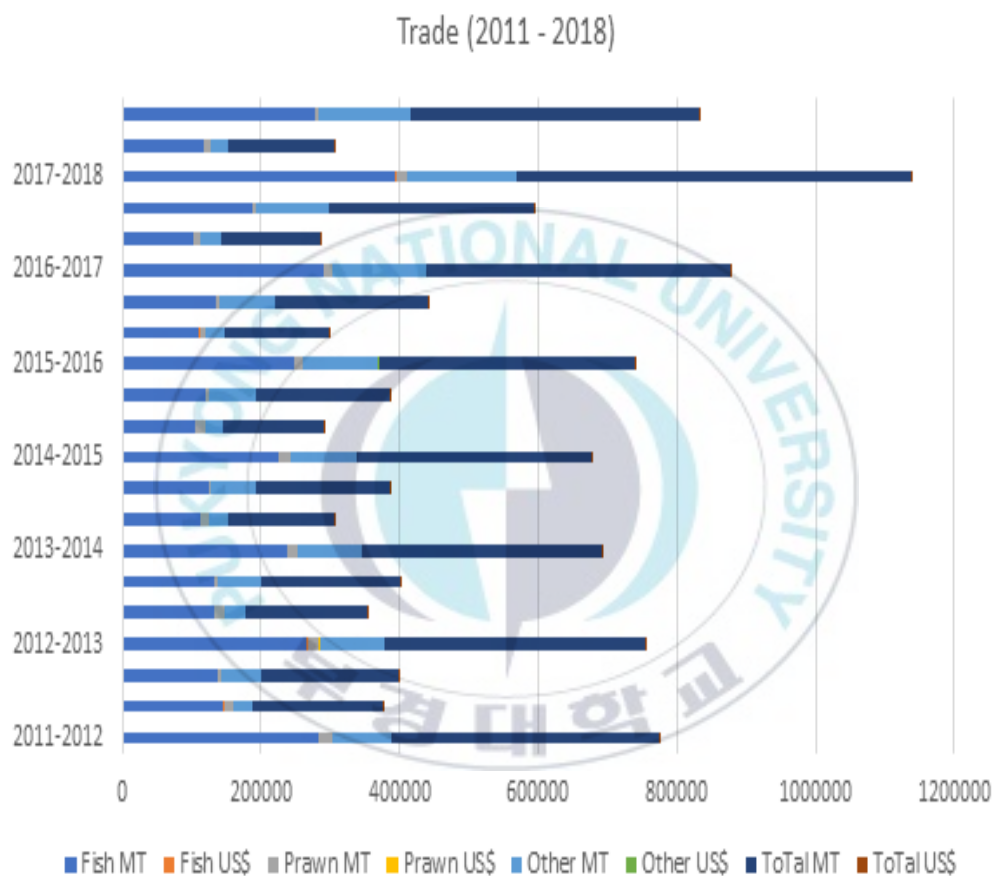


DATE	Year	Fish		Prawn		Other		Total	
		MT	US\$	MT	US\$	MT	US\$	MT	US\$
DECEMBER	2017-2018	38553.368	36.449	1499.929	5.071	19516.067	30.123	59569.364	71.643
	2018-2019	37075.215	34.83	1280.504	4.762	21665.197	31.104	60020.916	70.696
DIFFERENT		-1478.153	-1.619	-219.425	-0.309	2149.13	0.981	451.552	-0.947
JANUARY	2017-2018	48171.554	44.928	1457.659	4.409	20584.859	30.982	70214.072	80.319
	2018-2019	38772.236	36.574	1222.344	4.191	20437.596	31.111	60432.176	71.876
DIFFERENT		-9399.318	-8.354	-235.315	-0.218	-147.263	0.129	-9781.896	-8.443
FEBRUARY	2017-2018	43009.607	37.178	1298.29	4.723	13676.351	22.33	57984.248	64.231
	2018-2019	40747.502	35.14	1033.735	3.725	14780.316	23.53	56561.553	62.395
DIFFERENT		-2262.105	-2.038	-264.555	-0.998	1103.965	1.2	-1422.695	-1.836
MARCH	2017-2018	45506.877	38.453	1249.938	4.302	18923.995	26.914	65680.81	69.669
	2018-2019	46167.215	37.725	1123.698	4.633	20837.83	28.418	68128.743	70.776
DIFFERENT		660.338	-0.728	-126.24	0.331	1913.835	1.504	2447.933	1.107

Source; Department of Fisheries in Myanmar 2018



During the fiscal year from April 2017 to March 2018, it has been already exported to 46 countries by normal and border trade with the total amount of 568227.32 metric tons (income is USD 711.717).



Source : Department of fisheries in Myanmar 2008

[Figure 6] Export of Fish and Fishery Products By Normal and Border

Comparison between the 2016/2017 and 2017/2018 fiscal year, in this year, it has already exported with an overplus amount of



129,520.822 metric tons (income is 105.898) rather than the 2016/2017 fiscal year. In the 2000/2001 fiscal year, it has already exported amounts is 144,623.85 metric tons (income is 218.29). So, Comparison from 2000/2001 to 2017/2018 between 18 years it had exported with surplus amounts of 423,603.4 metric ton and income is USD 493.427.

## 7. Problems and Solutions for Distribution of Fisheries (Myanmar)

The impact on the national income is as follows: to build a linear regression model, we have defined the fisheries export items (Fish, Prawn, and Others) as an independent variable, while the value of GDP was considered a dependent variable. Thus, the regression model can be written under the following mathematical expression:

$$GDP = a + b EXP$$

where,

GDP = Gross Domestic Product ~ dependent variable;

EXP = Export items ( Fish, Prawn, and Others ) ~ independent variable;

a, b ~ parameters of the regression model

To determine the parameters of this model, we have considered a data set, regarding the evolution of the macroeconomic result indicators between 2000–2018.



<Table 7> Results of Linear Regression Models (Least Square method)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9492.8	3765.38	2.521074	0.0172
GDP(-1)	0.715862	0.072392	9.888732	0
FISH	41.60551	9.383382	4.433957	0.0001
PRAWN	-110.3493	40.01618	-2.757616	0.0098
OTHERS	14.20567	16.44367	0.863899	0.3945
R-squared	0.989654	Mean dependent var		39715.97
Adjusted R-squared	0.988275	S.D dependant var		23367.21
S.E of regression	2530.289	Akaike info criterion		18.64162
Sum squared resid	1.92E+08	Schwarz criterion		18.86381
Log likelihood	-321.2283	Hannan-Quinn criterion		18.71832
F-statistic	717.4244	Durbin-Watson stat		2.548736
Prob(F-statistic)	0.000000			

Fish is 41.61, positively contribution and prawn is - 110 negatively. Others are can not judge. It is desirable to increase the production of fish.

The probability that the model is correct is very high - approximately 98.9%, this conclusion is drawn from the results provided by EViews by for the tests: R-squared (0.989654) and Adjusted R-squared (0.988275). And also the viability of this regression model is confirmed by the values of the F-statistic test (717.4244 - far above the table level considered to be a mark in viability analysis for economic models), and also by the null degree of risk (0.000000 given by the value of the Prob F-statistic test).



## IV. Conclusion

Myanmar requires to achieve an international level of infrastructure development which includes international ports, airports, roads and highways, inland water, railways, electric power, telecommunications, and sewerage system development. Especially, to invite foreign investors and promote the fisheries sector, we need to try to reach a large amount of export, have a lot of research centers, and create a job in the fishing industry.

In Myanmar, it is seen that cold storage and ice plants are used more extensively. Nowadays, the ice plants and cold storages in Myanmar are important in the distribution of fish in Myanmar. And also, transportation is one of the most important factors in the fisheries economy. Both the supplier and consumers benefit from better transportation. Some problem has domestic distribution in the rainy season and some of the roads are inundated and transportation is impossible for the fish to be transported to the main market. Thus, the fish price can be high. By arranging transportation to inaccessible places and improving transportation already in existence will enable the suppliers to send the goods to the market in a short time thereby acquiring more profit and at the same time the consumers get fresh commodities cheaper too. Foreign trade also has some problems but we can solve that, in an international airport and Thalia seaport it only has in Yangon, so



we need to improve the transportation network for other states and divisions. For example, if we can construct a Dawei seaport, we can be sent a lot of fish to Thailand and other countries in a short time. Similarly, if we can construct a much cold storage and good transportation network, the fisheries sector can support to improve and develop the country's economy.





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