

THE REPUBLIC OF THE UNION OF MYANMAR

MINISTRY OF AGRICULTURE, LIVESTOCK AND IRRIGATION

DEPARTMENT OF FISHERIES



FISHERY STATISTICS 2016

THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF AGRICULTURE , LIVESTOCK AND IRREGRATION

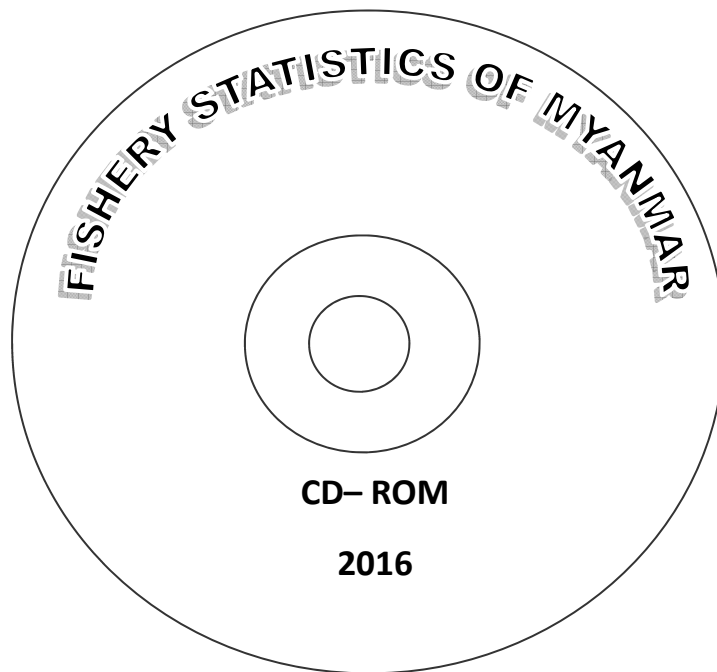
FISHERY STATISTICS

2016

Department of Fisheries
Myanmar

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Department of Fisheries

Ministry of Agriculture, Livestock and Irrigation

Office's Building No. (36) Nay Pyi Taw, The Republic of the Union of Myanmar.

Tel : (95 -67)408059

Fax : (95 -67)408048

E-mail :

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FOREWORD

Fishery Statistics of Myanmar for 2015-2016 fiscal year is published by the Department of Fisheries of the Ministry of Livestock and Fisheries. Since the fiscal year 2001-2002, the fishery statistics of Myanmar has been published with the objective of better understanding the situation and information on Myanmar fisheries. Moreover, we have added to some more facts and figures with the fishery information required from the previous 10 year up to this fiscal year, 2015-2016, for the convenience of all users. The annual reporting period used is fiscal year, from first April to the end of March next year.

Nowadays, the fishery statistics has been widely accepted as a tool in providing so as to know the current and past status of the fisheries and to draw up the short term and long term planning for fisheries including for food security and the rural development as well as for the conservation of fisheries resources.

It is clear that the reliable, accurate and timely data and information are needed for the effective fishery management and planning to meet the sustainable fisheries. Furthermore, the capture fisheries and aquaculture can provide many millions of livelihood opportunities of Myanmar people with resulting improved income generation and food-fish availability to the rural communities.

On behalf of the Department of Fisheries, I would like to express my heartfelt thanks to Dr. Aung Thu, Union Minister for the Ministry of Agriculture, Livestock and Irrigation for his valuable and kind guidance. We also thank to Dr. Htun Win, Deputy Ministers for the Ministry of Agriculture, Livestock and Irrigation.

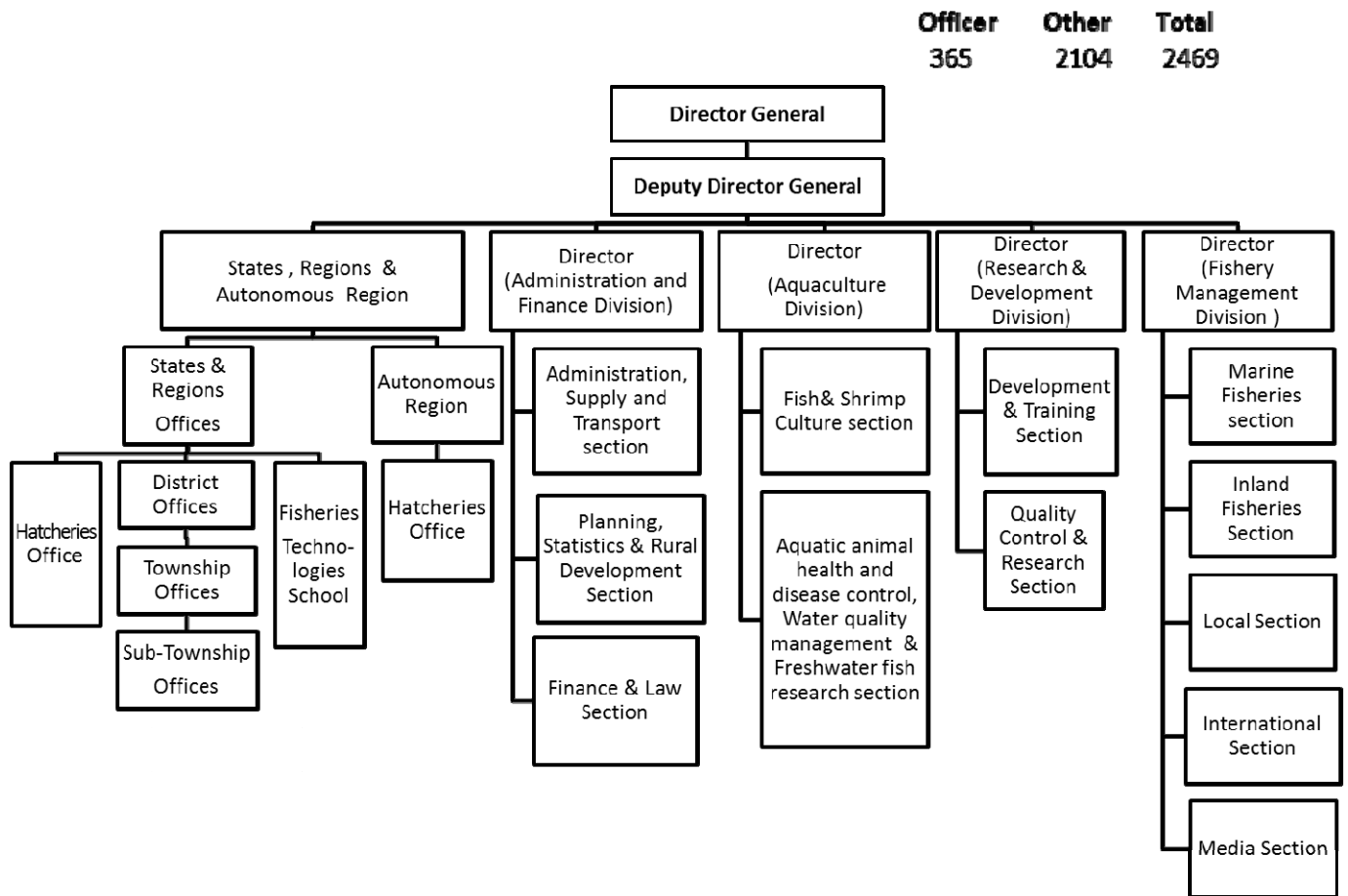
Moreover, Special thanks to U Myint Zin Htoo, Deputy Director-General and all of the Directors of the Department of Fisheries as well as all my staff for their contribution and hard working as completed the success of this publication.



Khin Maung Maw
Director-General
Department of Fisheries

September 27, 2015

ORGANIZATIONAL STRUCTURE OF DEPARTMENT OF FISHERIES, MYANMAR

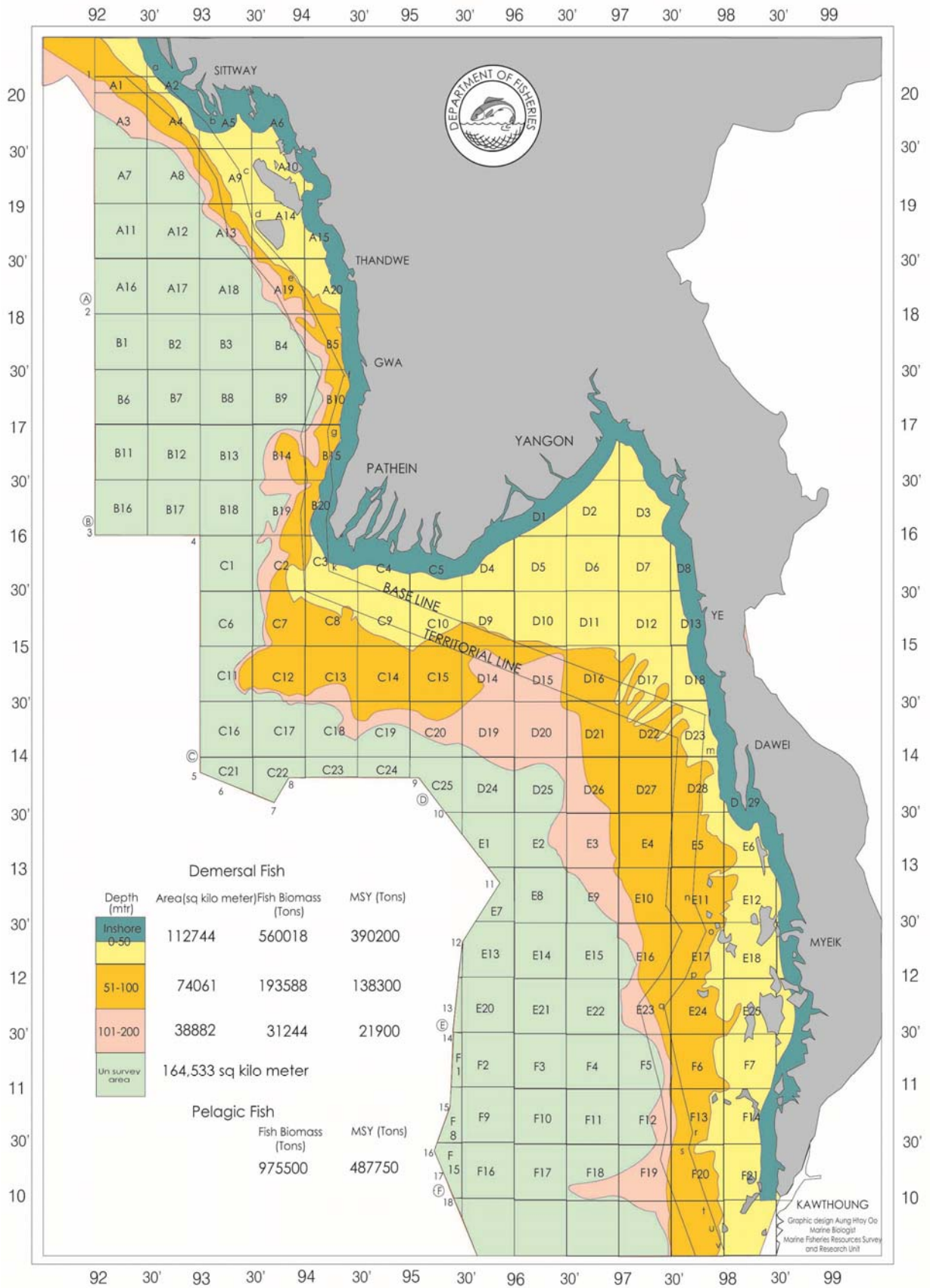


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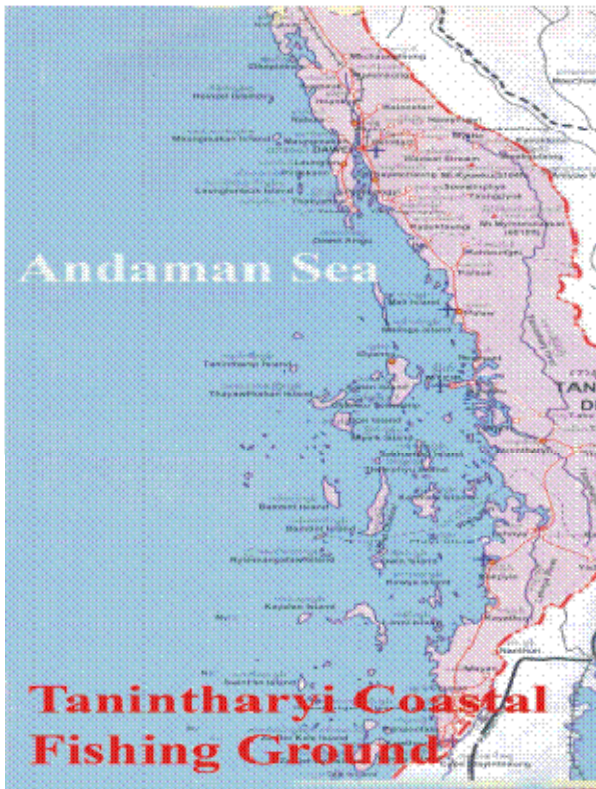
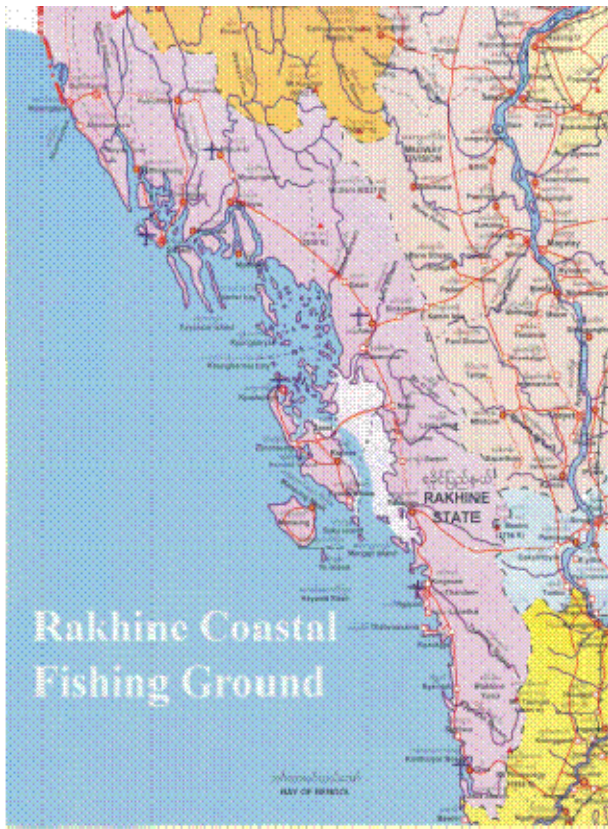


DEPARTMENT OF FISHERIES

Fishing Ground of Myanmar, Biomass, MSY and Un-surveyed Areas (1979-1980 surveys)



Maps of Fishing Grounds



PART ONE
FISHERY BRIEF IN MYANMAR

Fisheries in Myanmar

Fisheries in Myanmar's Economy

The fishery sector is considered as the most important one after the agriculture 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 dwellers. Moreover, fish is second only to rice in the Myanmar diet.

Myanmar is endowed with rich natural resources both in freshwater and marine fisheries. Nowadays, the increasing pressures from industrial and urban development and increased demand for fish and fishery products owing to population growth as well as global climate change can cause for damage to degradation of ecosystems including fisheries resources.

State of Fisheries

In 2015-2016 fiscal year, the total production of fish was 5.59 million metric tons in Myanmar. In this period, the production of freshwater fish was 2.59 million metric tons (46% of the total fish production) and the production of marine fish was 3.00 million metric tons (54% of the total production of fish in Myanmar).

The exported amount of fish and fishery product was (0.369) million metric tons and the value of which was (502.630) million in US\$ in 2015-2016. It was exported to (42) different countries. The exported amount was (7%) of the total production of fish in Myanmar in this period, 2015-2016.

Type of Fisheries in Myanmar

The type of fisheries in Myanmar is determined by nature of catch. It can be classified into freshwater fisheries and marine fisheries. Freshwater fisheries consists of (a) aquaculture, (b) leasable, (c) open fisheries. Marine fisheries include (a) inshore fisheries and (b) off-shore fisheries.

In the inshore fisheries, the fishing boats operate within from shoreline to (10) nautical miles .In this area, the fishing boat which is build by traditional type with not more than 30 feet long or using less than a 25 HP engine power, operates for fishing. The fishing gears for using are driftnet, gillnet and long line.

In 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 HP engine operating in offshore area. In this area, the commercial fishing gears are trawl net, purse seine, and long line.

Vision, Policies and Task

The Vision, Policies and Task are as follows;

Vision

In line with Millennium Development Goal, our ministry aims to develop rural area, to improve socioeconomic life for rural people and to narrow down the development gap between urban and rural areas.

Polices

- ◆ To be sustainable rural development
- ◆ To be food security
- ◆ To be food safety

Tasks

- (1) Rural Development will be carried out in accordance with (5) Strategic Frameworks.
- (2) Cooperation with Development Partnership organizations will be performed.
- (3) Community Driven Projects will be set up and implemented.
- (4) Trainings will be provided for socio-economic life development after organizing the rural youths.
- (5) Public Private Partnership System (PPPs) will be applied to develop capital investment, technology and markets.
- (6) Local and International investments will be invited to do associate with the State-Owned Enterprises.
- (7) Rule and Regulations will be laid down to protect private sectors and organizations undertaken socio-economic life development.
- (8) International Aids and technical requirements will be made efforts to get for upgrading Research Laboratories to International Organization for Standardization (ISO) standard and Bio-Safety Level-2(BSL 2) to develop Livestock and Fisheries sectors.
- (9) An audit system for fisheries and Fish Quality Control Laboratories will be extended upgrading.
- (10) Rural roads, water supply, housings and electrification projects as well as infrastructures for rural development will be implemented.
- (11) Good governance, transparency and publishing news will be carried out to narrow down the development gap between urban and rural area associated with the relevant ministries and development partnership organizations in line with a focal ministry.
- (12) Review and collection of the basic statistics and data will be performed for development in cooperation with the relevant ministries.

Management of Fisheries

Department of Fisheries (DOF) is responsible for the development of fishery sector of the Union of Myanmar and the responsibilities of DOF for development and management in fisheries are as follows;-

- (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;

Fish Price Survey

Department of Fisheries is implementing the fish price survey in Yangon every year.

Main Factors Affecting in the Production of Fisheries

The conservation of fisheries resources and the maintenances of ecological system are the main factors in the development of fisheries .Ecosystem of the world should be studied on the basis of their principle habitats for a wide variety of flora and fauna. Regarding the maintenances of ecosystem in fisheries, the management of conservation in the freshwater bodies (ponds, lakes, rivers, dams) which provide good habitats for phytoplankton, zooplankton, including aquatic plants and fishes and the conservation of marine ecosystem approach in marine water and its habitats to numerous plants, animals like zoo plankton, fishes, shrimps, oyster and so on., should also be studied as well. Moreover, the conservation of mangrove forest wetland and land-based ecosystem are substantial for development policy with a sustainable basis.

As we all know, mangrove are a source of shelters for fish. Many of coastal species spent the critical early stage of their lives in mangrove waters. So, the mangrove conservation is essential to save fisheries resources. Consequently, it ensures the sustainability of fisheries in the long term. Besides, the maintenance of ecological system is the conservation of reef and coral and declaration the marine protected areas (MPAs). It is the effective approach to improve the marine environment. The understanding of ecosystem function and its maintenance can help the development of fisheries in a sustainable manner.

The weather conditions depend on the environment. Deforestation is one of the factors for destroying the natural environment. So the forest conservation is needed by everybody. In the fishery sector, another important thing is the prevention of the fish disease which has been a difficult problem for fish-farmers. So, the sufficiency on the supply of good water quality is an essential matter.

Moreover, The public awareness for environment is very important for the sustainable fisheries and the people should be educated about the environment not to do over fishing and degrading the environment which are harming them-selves. It is, because we are being a part of the complex network of its environment.

The Role of the Private Sector in Fisheries

The role of the private sector of fisheries in Myanmar is operated by private entrepreneurs who can manage their business in their own ways in accordance with the rules and regulations which are laid down for them by the Government.

Regarding on this matter, since 1988 Myanmar made some dramatic and radical changes in social, political, and economic fronts. From that time onward, the market oriented economic system has been adopted in Myanmar. Since then, all fishery business in Myanmar was carried out by the private sector. Consequently, all state owned infrastructure of fishery sector such as, fishing vessels, ice-plants, processing plants, cold stores, fish-meal plants, canning plants etc. were sold out or leased to the private owners by the Government.

Legal Affairs

There are four relevant fisheries laws promulgated by the Government of Myanmar to manage the fishery industry and to protect the fishery resources more efficiently.

No.	Year enacted	Name of Fisheries Laws
1	1989	Law relating to the fishing rights of foreign fishing vessels
2	1989	Aquaculture Law
3	1990	Myanmar Marine Fisheries Law
4	1991	Freshwater Fisheries Law

After enacted these four fisheries law, the Government of Myanmar promulgated the two amending laws. These are as follows:-

No.	Year enacted	Name of Amending Laws
1.	1993	Law amending the Myanmar Marine Fisheries Law
2.	1993	Law amending the law relating to the fishing rights of foreign fishing vessels

Taking Action to the Illegal Harvest

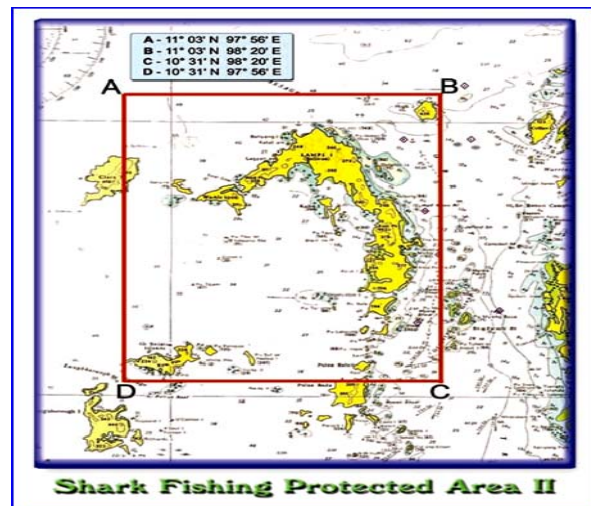
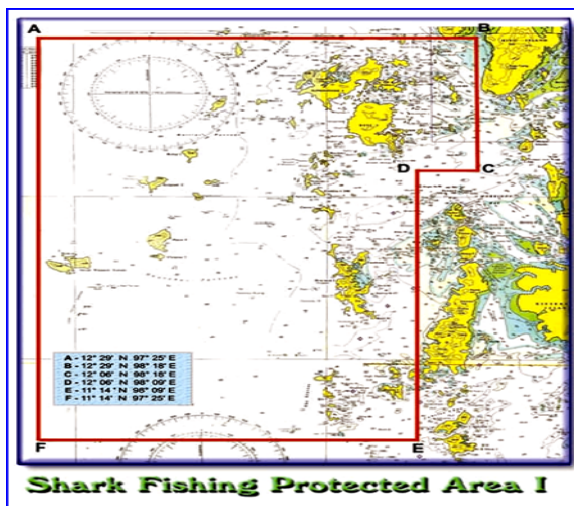
Department of Fisheries manages the conservation of the fishery resources. With regard to the conservation of the fisheries resources and to maintain for the long-term of the fisheries resources, DOF is managing to stop the illegal harvest for exporting such as alive mud crab (not allow to export which is (100) gram down weigh).

Food Security for Myanmar

For food sufficiency of Myanmar people including living people in rural area, the plan of implementation for food security were carried out by Department of Fisheries of Myanmar with the releasing fish fingerlings into natural resources such as lakes, dams, reservoirs, and open waters and the genetic improvement in rohu (*Labeo rohita*) to achieve the purpose of getting more and more growth rate of fish and the increase of fish production of per acre in order to get more income by the fishers and fish farmers. Moreover, Department of Fisheries has initiated and encouraged the paddy cum fish farming in Myanmar. Since 2009, the Department of Fisheries under the Ministry of Agriculture, Livestock and Irrigation has been carried out the implementation of genetic improvement in Rohu (*Labeo rohita*) with the short-term and long-term planning.

Marine Protected Areas (MPAs) and Marine Park and Marine Reserve

Conservation of fisheries resources has always been the primary concern of the Department of Fisheries, so Marine Park and Marine Reserves as well as fisheries protected area have been established under the Fisheries Law of Myanmar. Lampi island of the Thanninthayi coast has been designated as Maine Park and Marine Reserve in 1996. And then, regarding the shark resources conservation, no-body can conduct shark fishing operation in the protected areas stretching from "Rose" island to "Lampi" island; so Mergui Archipelago is famous for their shark, ray, coral reefs and other marine creatures and that is why in this area shark-watching dive tours are very popular with the tourists, who come to Myanmar from around the world.



FISHERIES MANAGEMENT DIVISION

Conservation Measures in Inland Fisheries

The freshwater fisheries waters means waters, pond, course, river, stream and lake which is of a permanent to temporary nature and in which fish live and thrive and which is situated within the inland boundary along the sea coast of Myanmar. Myanmar is endowed with Freshwater resources composed of riverine and estuarine system. Its extensive river system comprise Ayeyawady river which is about 2170km long and its tributaries are the Chindwin about 960 km long and Sittaung (560km), and Thanlwin (1300km). These riverine and estuarine systems provide for the nursery and spawning ground of fish which is main staple food of Myanmar people. Most of Myanmar people who live in rural area can access easily fishing in their place which is near creek or river, lake, flood area for their daily food. The fish provide as source of protein and very cheap or free nutrition for rural people in their whole life time as a gift of nature.

Department of Fisheries has been conducting the fisheries management and conservation measures to be responsible practice for exploitation and effective utilization of resources. In existing freshwater fisheries law(1991) and State and Regional Freshwater fisheries laws, it is prescribed the following objectives;

- (a) To further develop the fisheries;
- (b) To prevent the extinct of fish;
- (c) To safeguard and prevent the destruction of the freshwater fisheries waters;
- (d) To obtain duties and fees payable to the State;
- (e) To management the fisheries and to take action in accordance with the law

In accordance with the freshwater fisheries law, the freshwater fisheries classify into leasable fisheries, reserved fisheries, tender fisheries and the fisheries waters in which fishing rights are granted under a licence (open fisheries) for the fisheries management measure. The fishers and fisher groups or fisheries communities can obtain the lease or tender licence or Fishing implements licence in the freshwater fisheries waters.

To manage the fishing activities, DoF prescribed the procedures for firewater fisheries laws, regulations and licence conditions for determining the prohibited species of fish, size, fishing season, place, fishing gears and methods. DoF issued the notifications and directives for the resources conservations. DoF notified closed seasons during May, June, July to protect the breeders and fish fry.

In leasable fisheries, also known locally as Inn, the fishing rights are granted through a lease agreement with the DoF subject to stipulations relating to the area, species, fishing implements, fishing period and methods used. Open fisheries are also allowed based on the fishing license or floating tenders issued that specify the fishing grounds and any other methods that could be used in all inland water areas except in leasable fisheries.

Leasable fisheries also serve as conservation areas and production promotion sites based on collaborative arrangements among the lease owners and the DoF. However, the short-term lease period of one-year created some concerns as the lessees also had short-term outlooks for the fisheries and did not think of investing more in the fisheries and were not anxious to conserve the resources. As a matter of fact, this led to over-exploitation of resources as the lessees tended to maximize their catch without having thoughts on the sustainability of the fishery resources. Thus in 1909, the long-term lease system was adopted as means of preventing the extinction of indigenous species and depletion of fisheries habitats, sustaining fish production of leasable fisheries, monitoring and controlling illegal fishing in the lease areas, and promoting responsible fisheries practices in the lease areas.

In 1988-1989, the long-term lease permission program was suspended but was restarted in 1992. Under this resumed program, lease owners granted the long-term permission have to undertake various activities such as repairing the water ways where fish migrates, enhancing the fish stocks in the lease areas, and promoting the conservation of fisheries habitats. Considering that such activities could not be completed in one year, DoF grants the lessees long-term permission from 3 to 9 years. Thus, the lessees do not have to bid again for the auction and pay high fees for their lease areas during the lease period.

In order to promote the production and conservation of indigenous species, DoF has initiated culture-based system and capture-based system in leasable fisheries since 1997. At present, most of the lessees have been conducting these systems since these have provided them beneficial returns. Such practices in leasable fisheries have been promoted by the DoF as ways and means of obtaining sustainable fish production and at the same time promoting conservation measures.

As leasable fisheries progressed, some of the lease areas had been observed to be deteriorating due to siltation, agriculture operations, mining, and road and dam construction. The deteriorated habitats coupled with illegal fishing and overfishing resulted in the depletion of the fishery resources that eventually led to overall decreases in the country's fish production from inland capture fisheries. Thus, the DoF finally established guidelines for preventing further decline of habitats and fish stocks, especially in the lease areas based on long-term lease agreement of three years. Since then, nearly 500 leasable fisheries have been permitted to operate long-term lease arrangements annually. For the sustainability of leasable fisheries, DoF has been permitted the 1686 numbers of long term leases for preparation of water channels and practicing cultures based and capture based system in the leasable fisheries in cooperation with fishers (owners of leasable fisheries) in 2015-2016. Stipulations in the lease agreement include the conditions spelled out in the guidelines. Guidelines detailing the responsibilities of lease holders (lessees) in the lease areas are as follows;

- a. Submit to DoF proposal for long-term operation of lease area including work plan.
- b. Upon issuance of lease agreement, implement the work plan under the supervision of DoF;
- c. Conduct regular repair of waterways where fish migrates, and promote stock enhancement and conservation of fisheries habitats based on culture-based and capture-based systems;
- d. Promote conservation of indigenous fishes by adopting capture-based system;
- e. Enhance fisheries production using culture-based system by stocking fish seeds during the transition, *i.e.* nursing fish seeds in net enclosures in pens or cages or earthen ponds prior to releasing them to lease areas;
- f. Rehabilitate the habitats in order that wild fish would reach the spawning and nursing grounds in the lease areas, *e.g.* deepening of shallow water ways, removing fallen trees and small bushes as well as other aquatic growth, creating spawning and nursery grounds in some areas along the migration route;

To sustain the leasable fisheries, the capture based system and culture based system has been practiced by lessee in case of beneficial return. The lessee usually carry out according to their annual work plan depending on the different locations. Most usual work plan of lessees is as follows;

- a. May –June –July (closed season)
 - Preservation of fisheries habitat and maintenance of waterways
 - Digging shallow water ways, removal of fallen trees, small bushes and other aquatic growth
 - Preparation of fishing gear (fish pen in the lease area)
 - Inspection in the leasable fisheries area
 - Releasing fish fry into the leasable area
- b. August –March
 - Finished the construction of Fishing gears
 - Fishing period

Some leasable fisheries were transformed to reserved fisheries which need to protect and preserve the fisheries habitat and resources since 1992. Reserved fisheries means fisheries waters in which fishing operations are prohibited from time to time or in which subject it stipulation by the Department in order to prevent the extinction of fish and to propagate the same. There are 32 reserved fisheries and these are 9 in Yangon region, 5 in Sagaing Region, 3 in Ayeyawady region , 6 in Pago region and 9 in Mandalay region.

Another stock enhancement program is releasing seeds in the natural water bodies. This program was started in 1989-1990. 2113.48 acres for 12 Mud Crab protected areas and 896.96 acres for Lobsters Protected area is identified to protect the nursery grounds and spawning grounds.

These mud crab protected areas locate in township, 527000 Mangrove trees were planted in 1276.4 acres for preservation of biodiversity and mangrove ecosystem.

To maintain the sustainable production, 32.444 million fish fry are transplanted in the rivers, creeks, dam, reservoirs, lakes and rice fields and 66.12 million fingerlings were released into the leasable fisheries in cooperation between DoF and fishers in 2015-2016.

Department of Fisheries has been conducting the auction for leasable fisheries annually and DoF has collected the revenue 7181.753 million kyat in 2015-2016 fiscal years. Department of Fisheries has collected 1775.29 million kyat for tender fees and 63.489 million kyat for fishing implements fees in 2015-2016 in freshwater fisheries.

The Fisheries Development Meeting was conducted for the consultation on Fisheries Development Work plan in Mandalay on 21-6-2015. The workshop was led by U Khin Maung Aye, Deputy Minister, MLFRD and recommended 16 work plans for fisheries development. It was attended by state and Regional Officer of DoF, district officers, township officer and officers from hatchery office from Upper Myanmar.

The same meeting, led by U Khin Maung Aye, Deputy Minister, MLFRD was conducted in Yangon on 6-7.7.2015. It was attended by state and Regional Officer of DoF, district officers, township officer and officers from hatchery office from lower Myanmar. The meeting agreed to implement the 39 work plans for fisheries development in 2015.

The Regional Forums for inland fisheries was conducted in Mandalay on 26-27. 10. 2015. The forum was attended by U Khin Maung Aye, Deputy Minister, MLFRD, and experts from India, Bangladesh, Thailand, Lao, Cambodia, Local authorities from Mandalay Region, the professors from Universities, Pyopin, NAG and officials from Department of Fisheries. The forum agreed the 67 recommendations by consultation of 5 groups.

Fishing Vessel Registration and Licencing System of Myanmar

Department of Fisheries established the fishing vessel licencing system since 1988-1989. In former time, the fishing activities carried out by Myanmar Fisheries Enterprise which was state own business. In accordance with the existing fisheries laws, no one shall without a licence, engage in inshore fisheries and offshore fisheries.

Existing laws and policies on fishing vessel registration and licensing are as follows;

- Myanma Marine Fisheries Law (1990)
- The law relating to the fishing rights of foreign fishing vessels (1989)
- Law amending the Myanma Marine Fisheries Law(1993)
- Law amending the law relating to the fishing rights of foreign fishing vessels(1993)

The existing laws are complied with international plan of Action and cover implementation of vessel registration and vessel licencing. According to political and administration reforms in Myanmar, DoF is preparing the new comprehensive fisheries law. In new fisheries law, it will include rules and regulations for vessel monitoring system and port state measures.

Department of Marine Administration is responsible for registration of fishing vessels and fish carrier vessels under the flag of Myanmar. Department of Fisheries carry out the granting to, suspending and withdrawing fishing licences from fishing vessel or carrier vessels of Myanmar . Department of Fisheries is the authorities for implementing, controlling and enforcing laws, regulations and conservation and management measures which must be complied with by fishing vessels of Myanmar.

To apply the fishing licence to DoF, the fishing vessel must have vessel registration issued by Department of Marine Administration. It must have prior permission of DoF for importing of fishing vessel from other countries and building of fishing vessels. Application for prior permission must be attached legal documents for importing and duties of tax. For application of the fishing vessel registration, the recommendation of Department of Fisheries shall be submitted to Department of Marine Administration.

The fishing licences for fishing vessels are issued by regional or state office of DoF. The following documents requires to be submitted to DoF;

- Vessel registration issued by Department of Fisheries
- Live saving appliance (LSA)
- The previous fishing licence issued by DoF
- The vessel's photos (Front, back, left side, right side)
- The undertaking for truth of vessel's owner

The term of fishing licence is from 1st September to 31st August. The licence should be renewable annually and DoF record the issuance of licence. The changes of measurement, engine, owner, vessel's name and their infraction are recorded in DoF. Also vessel inventory has already prepared for some fishing vessels.

In accordance with the existing fisheries laws, the Master of fishing vessels :

- a. Shall abide by the terms and conditions contained in the licence;
- b. Shall hang the licence and registration certificate prominently at the wheel house of the vessel;
- c. Shall maintain ship's log-book and fishing data book as prescribed by the Department;
- d. Shall be responsible for the safety of the inspector, researchers, observers and trainees who are on board the vessel;
- e. Shall comply with orders and directives prescribed by the Department from time to time.

Vessel marking system for fishing vessel and carrier vessels also have established in Myanmar. Department of Fisheries issued the directives for vessel marking system for all foreign and local fishing vessel and fish carrier vessels. The four fishing grounds namely Tanintharyi, Ayeyawady, Mon and Rakhine , has divided for administration measure in fisheries. The vessel marking system for each region and state is identified as follows;

For offshore fishing vessel in Tanintharyi region , the hull colour is red and word colour is white. For Ayeyawady and Mon, hull colour is grey and word colour is white. For Rakhine Coastal region, hull colour is Yellow and word colour is white. For all carrier vessels, hull colour is white and word colour is red. The diameter of word is 8 inches and width of word is 1.5 inches.

The hull colour of foreign fishing vessel (Joint venture and Tuna Long line Fishing Vessel) is white and word colour is red. The diameter of word is 8 inches and width of word is 1.5 inches.

Inshore fishing licence issue by DoF in township level and offshore fishing licence issue by DoF in Regional and State level and Head Office. All inshore and offshore fishing vessels must have fishing vessel registration issued by Department of marine administration. The registration of fishing vessel in inshore fisheries is carried out by Department of General Administration which was authorized by Department of Marine Administration. For registration of offshore fishing vessels is conducted by Department of Marine Administration.

In 2015, DoF had issued the licence for 12583 non- mechanized boats and 13831 mechanized boats and totally 26414 boats in inshore fisheries. DoF issued the fishing licence for 3030 local fishing vessels which are owned by national in offshore fisheries. Department of Fisheries has collected licence fees 1340.494 million kyat from the inshore fishing vessels and offshore fishing vessels.

The fishing gear registration is included in the fishing licence. One fishing vessel is permitted one fishing gear only. If the fishing vessel owner wants to change the fishing gear, he shall apply to DoF for permission. The specification and limitation of fishing gears and other license conditions is stated in the fishing licence card. Currently, DoF is trying to improve the licensing system in electronic format under the e. government system.

Regarding with fishing vessel records, SEAFDEC has been assisting the South East Asian Countries in their efforts to combat IUU fishing through the implementation of the project on the Promotion of Sustainable Fisheries and Counter Measures to Reduce IUU Fishing in South East Asia funded by Japanese Trust Fund. One of the activities under the this project is the Development of a Regional Fishing Vessel Record (RFVR) starting with vessel measuring 24 meters in length and over which refined fishing licencing systems could be used as tools to combat IUU fishing in the region. In order to sustain the establishment of the RFVR for vessels 24 meters and over, SEAFDEF deemed it necessary to develop and manage the relevant Database. Myanmar also participates in sharing information for RFVR in this project and continues submitting of the record of 24 meters and over.

The basic information requirements for RFVR for 24 meters in length and over had updated as shown in following table ;

No.	Information of fishing vessel
1	Name of Fishing vessel
2	Vessel registration Number
3	Owner Name
4	Licence Number
5	Expiry date of Licence
6	Type of fishing method/gears
7	Port of registry
8	Gross tonnage (GRT/GT)
9	Length (L)
10	Breadth (B)
11	Depth (D)
12	Engine Power
13	Shipyard/Ship builder
14	Date of launching
15	International radio Call Sign
16	Engine Brand
17	Serial Number of Engine
18	Hull material
19	Date of Registration
20	Area(country) of fishing operation
21	Nationality of Vessel (flag)
22	Previous name (if any)
23	Previous flag (if any)
24	Name of Captain/Master
25	Nationality of Captain/Master
26	Number of Crew (Maximum/Minimum)
27	Nationality of Crew
28	IMO number (if available)

Aquaculture Division

The structure of Aquaculture Division comprises of Fish and Shrimp Culture Section, Aquatic Animal Health and Disease Control Section and Water Quality Management Freshwater Fish Research Section. The main responsibilities of Aquaculture Division are to produce good quality fish and prawn/shrimp seeds for fish farmers, to ensure replenishment of fish and prawn seeds into the natural water bodies such as rivers and lakes and men-made water bodies such as reservoirs and dams for enrichment of fisheries resources, to conduct researches of potential marine and fresh-water aquatic species for aquaculture development, to contribute and transfer of basic and applicable aquaculture technology to fish farmers and to conduct environment-friendly and sustainable aquaculture methods such as Good Aquaculture Practices to align with ASEAN Guidelines of Good Aquaculture Practices and EU market requirement.

Duty and function of Aquaculture Division

- a. Producing of good quality fish and shrimp seeds by DoF fisheries stations,
- b. To ensure conservation of fisheries or aquatic resources not to be depleted by the releasing of hatchery produced fish and shrimp seeds to natural water body,
- c. Formal services of analyzing water and soil quality for fish pond management and of diagnose the fish and shrimp diseases, giving guidance of disease control and prevention for fish farmers,
- d. Monitoring, control and given good management and regulation on aquaculture industry,
- e. Strengthening good management for the development of environment-friendly aquaculture system and the encourage of cultured based capture fisheries to increase of fish production,
- f. Issuing the amendments of aquaculture laws, legislation and regulation as the requirements of current situation,
- g. Supervision of expertise for the establishment of short-term and/or long-term aquaculture development programs,
- h. Data collecting, recording and analyzing on aquaculture areas and fish and shrimp seeds production from DoF fisheries stations,
- i. Applying the international and ASEAN guidelines (Good Aquaculture Practices- GAqP) of sustainable aquaculture development compliance with Myanmar weather and environmental conditions,
- j. Support to conduct trainings of basic fish farming and fish breeding technology for local fish farmers and capacity building of skillful technology and techniques of aquaculture systems,
- k. Seeking the improved technologies of aquaculture and providing extension and training for sustainable development and expanding of aquaculture industry as a whole,
- l. Implementing and managing to be able to fully imposing of revenue for aquaculture registration,
- m. Regularly observing the aquaculture industry development as a whole and recording and reporting the extraordinary phenomenon of climate change impacts on aquaculture industry and emerging fish diseases to prevent and adapt from these impacts.

In Myanmar, aquaculture areas have been increased from 12255 ha in 1990-1991 to 64438.8 ha in 2000-2001 and then to 180112 ha in 2010-2011 and 193523 ha in 2015-2016. Aquaculture production has also increased steady annually from 6397 MT in 1990-1991 to 128225 MT in 2000-2001 and 999629 MT in 2014-2015. The production from aquaculture subsector increased to 1014420 MT in 2015-2016, which was an increase about 1.5 % compared to 2014-2015 production.

Freshwater Aquaculture

Currently over 20 species of freshwater fishes including common carp, Indian major carps, Chinese carps, tilapia, Pangasius and walking catfishes and Pacu are being cultured. Rohu (*Labeo rohita*) withstands as the most common and commercial cultured species which is native to Myanmar. Actually the collection of fry and fingerlings has not been permitted so as to conserve and enhance the natural fish stocks. This is as a measure of follow-up of the Law Relating to Aquaculture that was promulgated in 1990. However in order to develop aquaculture particularly in production and productivity of quality fish seeds, hatchery concerned farmers are allowed to collect the fry and fingerlings prior to permission of DoF. As a result, rohu aquaculture industry becomes more developed and promising. In order to promote and distribute the quality fish seed, DoF has tried to upgrade the broodstocks quality by proper management through its 27 fishery stations that are conducting seed production and providing technical assistance to farmers.

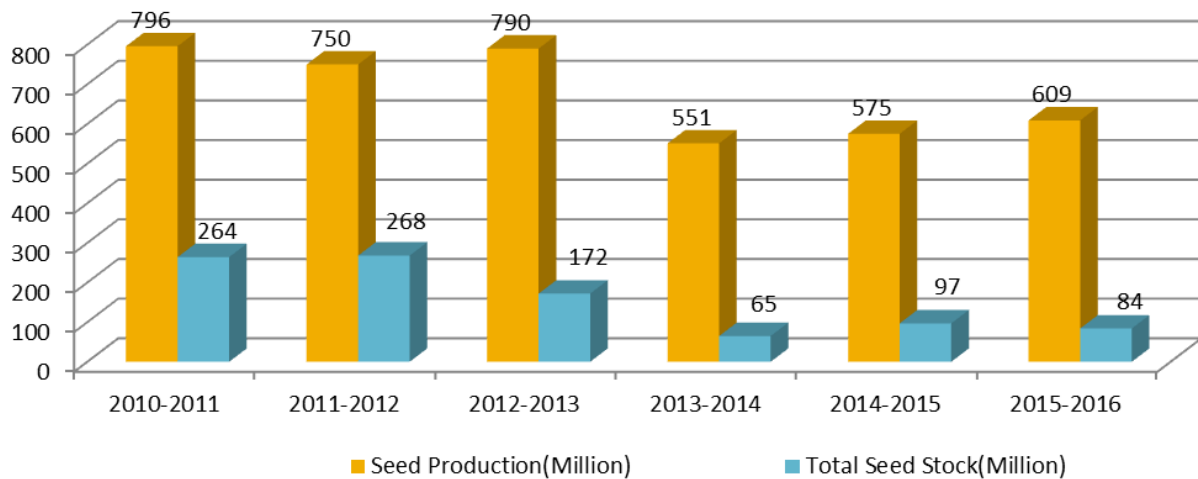
The potential important freshwater fishes such as *Heteropneustes fossilis* (Catfish), *Ompok bimaculatus* (Sheat fish), *Notopterus chitala* (Spotted feather back), *Cyprinus Intha* (Nga phane), *Trichogaster pectoralis* (Snake skin gouramy), *Pangasius bacourti* (Stripped catfish), *Prochilodus lunellus* (*Taung paw nga tha lott*), *Leptobarbus hoevenii* (Sultan fish), were successfully induced breeding by experimental scale.

Workforce

In the field of aquaculture, a total of 32483 fish and shrimp farmers were involved in various aquaculture systems. Due to Myanmar's aquaculture is mainly based on pond cultured system, mostly men labours are working in fish/shrimp ponds. There are 131639 number of permanent men labours working in 2015-2016 fiscal year.

Fish Fry and Fingerling Production

In 2015-2016, 26 hatcheries owned by the Department of Fisheries had managed to produce a total of 608.7 million freshwater fish fry and fingerling whereas 39 private hatcheries around Myanmar had produced an impressive amount of 1613.5 million fry and fingerling. Accordingly the Department replenishes the natural resources by stocking the hatchery bred quality fish seeds into open waters like rivers, dams, reservoirs, lakes and impoundments. Data on production and stocking of seeds from 2010-2011 to 2015-2016 appears as a graph there under.



At the same time in order to increase fish production and supplementary income, Department also initiated the paddy cum fish farming in appropriate regions through demonstration 14236 acres of paddy field in States and Divisions were stocked with fish seed in 2015-2016.



Freshwater prawn culture

The most common and prioritized species is commercially important giant freshwater prawn, *Macrobrachium rosenbergii*. Monoculture of *M. rosenbergii* was conducted on semi-intensive level by a few farmers and productivity was better than polyculture system. Constraints of the availability of sufficient amount of fresh water prawn at local area, technical expertise of monoculture system, most of the prawn farmers are practiced the polyculture system stocked with fresh water prawn and fish to minimize the operational cost. There was total area of 7517.25

hectares of prawn and fish polyculture farms in the whole country. Only few areas of prawn monoculture farms are registered. The hatchery operation and culture technique become well established in government and private sector. Recent year, many fish farmer's benefits from poly-culture of freshwater prawn and major carps due to reasonable price of freshwater prawn. Therefore, freshwater prawn seeds requirement is increasing in recent years. Many backyard hatcheries for freshwater prawn are being set up to fill up the gap of high demand freshwater prawn seeds but last year, most of the freshwater prawn hatcheries were encountered the low survival rate due to disease infection from the brood stock.

Shrimp Culture

Penaeus monodon has been initiated since early 1980 practicing trap and hold method particularly in western coastal area. Natural post-larvae of *Penaeus monodon* were trapped into the pond during the high tide period through sluice gates. There were no inputs in terms of pond preparation, eradication of predators, water fertilization, feeding etc. However 70 to 123 kilograms of large size of shrimp per hectare of culture area were harvested. As the ponds were usually as large as 50 to 100 hectares, the shrimp production could make more than enough money for the shrimp farmers. Having no laws concerned with aquaculture, those shrimp ponds existed as illegal ponds up to 1990. In the year 2000, the Ministry of Livestock and Fisheries reinforced and encouraged many potential investors to be involved in the shrimp aquaculture development. At the same time, the Union of Myanmar formed a State Level Committee to promote a drastic development of shrimp aquaculture industry by formulating first three-year plan from 2000 to 2003 and second plan from 2003 to 2005. Since 2000, a number of semi-intensive and intensive shrimp farming emerged. Up to 2002, there was founded success and failure in semi-intensive and intensive shrimp culture. In the year 2002, a pilot demonstration on Mangrove Friendly Shrimp Culture was conducted as a measure of verification of semi-intensive shrimp culture technique through collaboration of Myanmar DoF and SEAFDEC-AQD. Demonstration pond with 1.4 ha and 0.72 totaling 2.12 ha could produce 11.1 metric ton of shrimp with average size of 50 pcs / kg. At the same time, private shrimp farms nearby the demonstration pond suffered failure due to severe occurrence of white spot disease. The private farmer were invited and disseminated the comprehensive technology. But they were not so much interested in MFA technology. Similar demonstration was repeated in 2005 and also gained the success. A few private shrimp farms applied the MFA technology with success but later due to market and shrimp price constraints shrimp farming has been done only by a few farmers.

As of 2015-2016 Myanmar have three types of shrimp farming: Semi-intensive shrimp ponds 2181.72 hectares, Extensive plus shrimp ponds 33813.73 hectares and Extensive or traditional shrimp ponds 52983.20 hectares totaling 88978.66 hectares. The total production of fresh water prawn and marine shrimp in 2015-2016 were 67723.87 MT. Recently, the Department of Fisheries encouraged to development of fish and shrimp culture in every states and regions for self-sufficient of local consumption and increasing for export market.

Status of Shrimp Hatcheries

In the year 2000, total numbers of shrimp hatcheries amounted to 13 only and in 2003 altogether 26 shrimp hatcheries (include in Backyard Hatcheries) were fully operating with capacity of 190 million shrimp post-larvae. Hatchery system is mainly based on clear water system. The breeders are available from Bay of Bengal and Andaman Sea. It is well famous that the broodstocks from Andaman Sea are supreme in terms of quality and size. However, recent years, many hatcheries including private and public are facing the difficulties of the availability of the sufficient amount of shrimp brood stocks when required. Therefore, local shrimp hatcheries could not produce sufficient amount of shrimp seeds for local demand and shrimp post larva had to import from neighbouring countries such as Thailand and Bangladesh. Import numbers of shrimp larva from Bangladesh was not yet available. In 2015-2016, tiger shrimp larva was imported in the amount of 23 million from Thailand.

White shrimp culture

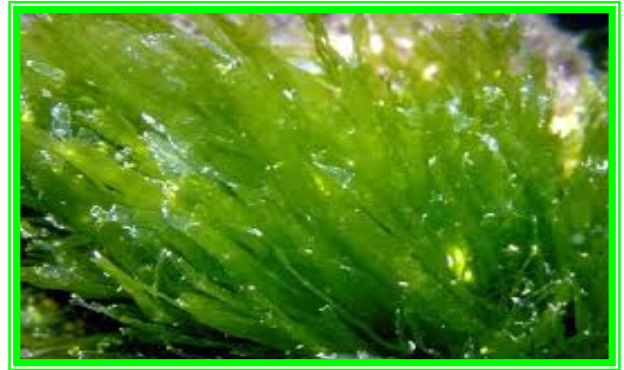
Penaeus vannamei has the many advantageous factors for culture but it may also cause the negative impact to other shrimp aquaculture industry. DoF has been aware that *P. vannamei* may carry and outbreak the Taura Syndrome Virus (TSV). After a regional workshop in 2005 at Manila, that assessed the culture of *P. vannamei* ASEAN countries agreed to culture at reasonable documentation. At present 3-4 private farms are trying to culture of experimental scale of *P. vannamei*. Only PCR negative the Pacific white shrimp SPF *P. vannamei* seeds has been permitted to import for culture in domestic water. In 2015-2016, the total numbers of 29.7 million *P. vannamei* larva were imported.

Marine Finfish Culture

In terms of marine fin-fish farming, seabass, red snapper and grouper are the most common and commercial species in Myanmar. Stock fish or the fish seed are usually collected from the wild. But the seed production technology of seabass has been succeeding since 2004 in both DoF and private sectors. First the broodstocks were collected from the wild and later induced breed seabass are used as broodstocks. However the grow-out culture of seabass is done by only a few farmers. It is due to the fact that adequate supply of seabass seeds, trash fish and formulated feed is inconsistent. Induced breeding of Grouper spp., was also conducting at Marine Research Station of DoF, Tanintharyi region by experimental scale but survival rate is very low.

Others Mariculture

Others aquatic species such as oyster, clam, seaweed culture are initial stage in Myanmar. The farming of *Eucheuma* sea weed has been started since 2003 through the collaboration of DoF, a Korean private company. The Korean company brought in the seaweed of *Eucheuma cottonii* and domesticated as the seed stock for other private farmers. Upon the whole, DoF Myanmar is carefully assessing in the promotion of proper new stock strains to produce better quality seed. Recently, Make Smart Company has already constructed a processing plant and storage building. The new endeavor will create employment opportunity for local people and also technology transfer to the local entrepreneurs and communities. The production of dried seaweed in 2015-2016 was 4.20 tons.



Mud crab seed production

Mud crab fattening has become the booming industry as domestic consumption and export demand are growing rapidly. Soft shelled mud crab farming has become very popular as it commands high price. At the same time, supply of crab juveniles from nature is decreasing due to over exploitation, habitat deterioration caused by man impact and world climate change. Adequate supply of mud crab seed for soft shell mud crab farming has become urgent need and included in the future plan. Myanmar DoF has initiated the mud crab hatchery since 2009. However hatchery operation performs very low survival rate. There needs to do more research and extension work for dissemination of mud crab culture techniques to local small scale farmers and conservation of mud crab resources as setting up the protected area of no crab fishing zone or conservation of mud crab habitats such as mangrove.

Cold Water Species Aquaculture

Some cold water aquatic species naturally exist in the northern most part of the country where temperature is very low. DoF is established a backyard hatchery for breeding of potentially important local indigenous fish species since 2012 and for dissemination of basic fish culture technology to the local ethnic group.

Ornamental fish

The ornamental fish industry is one of the main sectors to generate income through export. The production of ornamental fish was almost the same by 1.45 million pieces in 2014-2015 compared to 1.45 million pieces in 2015-2016. However, the value of ornamental fish production also increases to US\$ 0.20 million from US\$ 0.16 million in the previous year.

Aquaculture for rural development

Promote aquaculture as an integrated rural development activity within multiple use of land and water resources available through inter-agency coordination in policy formulation, project plan-ning and implementation, stakeholder consultation, extension services and technology transfer. One of the national policy is the poverty alleviation and to carry out rural development through agriculture and other sectors. Actually about 70 percent of the country people are living in country -side and remote areas. JICA incorporated and collaborated with DoF by establishing JICA unit at DoF and started its project plan in 2005. The strategic project plan is firstly conducting on-site training at appropriate areas to the villagers on small-scale aquaculture. Then secondly it implemented demonstration based on self-participatory approach. Thirdly JICA provides 70 percent of the cost for village level community farming that shared 30 percent. Profit sharing basis is to keep 50 percent for next operation, 20 percent for donation to the nearby school or village clinic and 30 percent is to share for community members. The first phase of JICA project completed in 2013 June. Based on evaluation of effectiveness and capacity needs, JICA is now continued projects from 2014 March in Dry Zone Myanmar. Moreover, ACIAR, KOICA also supporting and cooperation with DoF for improving research & development of Myanmar's Inland & coastal fisheries.

Fisheries sector of evergreen village development project supported 30 million kyats as revolving fund for each villages of 325 villages where have potential to develop in fisheries sector in 15 Regions and States in this fiscal year from the funding sources of government's capital budget and Department of Fisheries will try the best to achieve the objective of the development of fisheries sector for rural peo-ple. In addition, Department of Fisheries construct-ed 122 numbers of fish backyard hatcheries at 15 different Regions and States in this 2015-16 fiscal year for conducting self breeding practice of fish to fulfill the needs of fish fry from rural fish farmers, for stock enhancement of fish seeds to creeks between paddy fields and for improvement of the production of fish seeds to conduct the cultured based capture fisheries at leasable fisheries.

Application of Good Aquaculture Practices (GAqP)

The Department of Fisheries of Myanmar already initiated Good Aquaculture Practices as national standard in fish and shrimp farming since 2011. The Department of Fisheries established as National Task Force for implementation of GAqP application in Myanmar and considered to follow up and practices on ASEAN's Standard on GAqP for shrimp farming in compliance with the

current status of shrimp farming practice in Myanmar. Myanmar learns and tries to follow the Strategies Plan on the Development and Implementation of ASEAN shrimp GAqP. Support to GAqP, DoF established the Directives and Regulation for prohibiting the use of chemical in aquaculture.

Recently, cultured areas of about 4439.55 hectares for fish, shrimp and soft-shelled crab farming have applied to get national GAqP certificates. The Department of Fisheries has issued GAqP certificates on 1549.2 hectares for 7 farmers during last year. For the trade promotion of the aquaculture products, EU gave the awareness training of GAqP (7) times for capacity building of DoF staff (41 people) including 119 numbers of stakeholders in 2015-2016.

Aquaculture support services

In 2015-2016, the coordinating plan of Aquaculture Division, Regional and State of DOF and the fish hatcheries stations will support to fish farmers for providing breeders and technical advices to small-scale farmers for poverty reduction and rural development at the township level. Under supervision of aquaculture division, aquatic animal health and disease control section and Freshwater fish research section are (3)groups of Mobile Team giving on-site support services for fish farmers who want to check their ponds water/soil parameters and health condition of their cultured fish for preventing the fish disease and farm management. In addition, Aquatic animal health and disease control section also provides PCR check on shrimp diseases of shrimp seeds for shrimp farmers. In 2015-2016, Freshwater fish research section gave services of water quality analysis on 973 cases and soil analyses on 3 cases including Tontay Lab and Mandalay Regional Lab. Aquatic animal health and disease control section provided support services of on-site field analyses on 14 cases, lab disease analysis on 71 cases and PCR check for disease on 51 cases. In 2015 August, natural disaster of flooding due to heavy rain affected the commercial aquaculture ponds and small scale fish farmers and DoF therefore, supported 50 numbers of broodstock and 14.23 million fish seeds to local farmers.

RESEARCH AND DEVELOPMENT DIVISION

Inspection and Certification Section

Food safety management systems such as ,GMP/ HACCP are operated enforcing by Inspection and Certification Section, Department of Fisheries in Fishery establishments to implement in exported fishery products according to ASEAN Regional Guideline, importing countries' requirements, code of practices in the regulation.

According to the responsibility for the quality of exported fishery products to meet international standard requirements including importing countries' requirement, Inspection and Certification Section has been implementing the monitoring, control and surveillance (MCS) activities to ensure the quality and safety of fish and fishery products . At the present Inspection and Certification Section has been formed with (5) officers and (25) staffs to confirm processing establishments which have complied or not food safety management systems.

Inspection and Certification Section has carried out to improve quality wholesomeness and safety of fishery products for human consumption and minimized post-harvest loss to develop and apply quality and safety management systems that ensure food safety through the implementation, validation and verification of Hazard Analysis Critical Control Points (HACCP) based system, to improve inspection practices and harmonies with international inspection systems adopt quality and safety management systems as appropriate to the fishery industries to develop and implement GMP guidelines and compliance standards.

And then, Inspection and Certification Section issued the factory license for (116)processing establishments in 2014-2015 fiscal year to monitor and control for the procedure of processing establishments as the requirements of international standard for food safety and quality assurance.

And then, Inspection and Certification Section, DOF issued the factory license for (116) processing establishments in 2015-2016 fiscal year to monitor and control for the procedure of processing establishments as the requirements of international standard for food safety and quality assurance. Besides, Inspection and Certification Section has already formed four inspection teams and regularly examined the implementation of food safety management system such as GMP, SSOP, and HACCP due to official control manual. Currently , 20 establishments have been approved exported to EU, 27 establishments have been approved exported to Vietnam , 6 fish meal establishments and 87 establishments including dried product warehouse, chilled product site have been approved exported to China .

Myanmar has been exporting only frozen wild caught fishery products from (20) approved establishments, Inspection and Certificate Section has been performing to export aquaculture products to EU member countries assistant by EU. National Residue monitoring plan are prepared and guided by international expert from EU Commission .National residue monitoring plan(2015-2016) was sent to DG SANTE. Good Aquaculture Practices has been performed in

these NRMP implemented aquaculture farms by the assistance of EU also. EU -GIZ has already trained 120 participants including DoF and Aqua farms in GAqP compliance and Traceability.

Currently, Inspection and Certification Section, DOF issued the “ Technical Regulation for Export Import Fishery Products” based on WTO- SPS agreement assistance by FAO according to "Capacity Building to Improve Market Access for Fish and Fishery Products- TCP/MYA/3401(D) project", to operate in food safety activities due to the international market requirements especially ASEAN, China and importing countries requirement. Similarly, Inspection and Certification Section, DOF proclaimed Directive -2/2015 dated on 14-7-2015 to comply in fishery activities .Thus , EU has been supported through the supply chain such as fishing vessels, landing sites, ice plants due to comply with food safety management system due to the Trade Development Program .

An AEAN Rapid Alert System on food and feed (RASFF) is ongoing network for notification of direct or indirect risks to human health deriving from food or feed between competent authorities. DOF has participated in pilot Rapid alert system for food and feed since 2007 and contact with regional activities. Inspection and Certification Section has conducted the training for ASEAN Rapid Alert System for Food and Feed in 19th January 2015 to 21st January 2015 by Experts from Thailand. Otherwise ,Inspection and Certification Section, DOF has performed Trade Control and Expert System (TRACES) by the assistance of EU-GIZ according to the Trade Development Program .

As Myanmar is one of the member countries of ASEAN, Inspection and Certification Section has implemented the ASEAN Regional Guidelines such as Implementation of the ASEAN Common Principle and Requirement for Food Hygiene, Implementation of the ASEAN Common Principle and Requirements for the labeling for pre- package food and Implementation of the ASEAN Common Principle for food Systems in establishments before ASEAN Free Trade Area.

Otherwise, according to ASEAN Economic Blue Print, Inspection and Certification Section has been implementing food safety issues related priority integrated sectors to harmonies in trading between ASEAN countries. Inspection and Certification Section has been implementing the minimum requirement for seafood trade in ASEAN particularly the farming system requirements, product standards, laboratory accreditation and health certification requirements.

Analytical Laboratory Section

Continuously Maintain the Accredited Laboratory Comply with ISO 17025:2005

The Laboratory, Analytical Laboratory Section of Fish and Quality Control Division of Department of Fisheries(Yangon, Myanmar) Accreditation No. 1225/55 has been assessed for reassessment of accreditation Code HP 255/54 in accordance with ISO/IEC 17025:2005 by the assessor team of the Bureau of Laboratory Quality Standards (BLQS), Department of Medical Sciences (DMSC) Dated on 28-30, March 2016 at reassessment (Microbiological Test(TPC, Coliform, *E.coli*, *Salmonella*, *Staph.aureus*) and Chemical Test (Nitrofurantoin, Chloramphenicol) and Extended

Parameters(Micro Test for *Vibrio cholera* and *Listeria monocytogen*), Chemical Test for Heavy Metal(Cadmium, Lead and Mercury) and Tetracycline. Now, Laboratory was already finished reassessment and the certification valid has been January 2017. Because Laboratory have waiting time the BLQS Committee decision for Corrective Action results at next two years (2016 to 2018).

Participation the Proficiency Test (PT) Programme

Laboratory had participated the Proficiency Test once a year for all accredited parameter. In detail, Microbiological testing include TPC, Coliform, *E.coli*, *Salmonella*, *Staph.aureus* , *Vibrio cholera* and *Listeria monocytogen*) spp; in Meat and Shrimp , Heavy Metal Testing dated on September-November,2015 were participated PT from QMAS-LGC(UK). Chemical Testing included Nitrofurantoin Test(March-April,2015) with FAPAS(UK) and Chloramphenicol Test (Dec,2015) with Central Lab(Thailand) in detection of Shrimp.

Calibration Certificate for Measuring Equipment & Devices

For 2015 program of calibration by ISO17025:2005 accredited laboratory's maintenance was finished and calibrated at 12-May,2015 with Technological Promotion Association (TPA) from Thailand. All measuring equipment and instruments are 39 items. For 2016 Calibration program are under process of regulatory status.

Preventive Maintenance

The laboratory had contracted every year for Regular Preventive Maintenance (RPM) between DoF and Sciex (Thailand) Co., Ltd from Thailand AMTT Co., Ltd from Myanmar for LC/MS/MS of 2015. Some of the Microbiological Lab's equipment and remaining chemical equipments as HPLC and AAS also finished preventive maintenance by AMTT Co., Ltd and Okkar Thiri Co., Ltd from Myanmar.

Action Plan for Future

Myanmar DoF Laboratory had participated the Japanese Trust Fund VI project for Biotxin Monitoring in ASEAN conducted by Marine Research Department (MFRD), project period from 2013 to 2017.National Residue Monitoring Program (NRMP) Progress report(2015-2016) and Annual plan(2016-2017) submit to EU, DG-SANTE.

Environment and Endangered Species Conservation Section

Sea Turtle Conservation and Management

Nesting of turtles is observed around Andaman Sea, Gulf of Mottama (Gulf of Mattaban), and Bay of Bengal.

Since 1963, the Department of Fisheries (DoF) has taken up a project to propagate and conserve marine turtles on Thameehla Island (Diamond Island) in Ngaputaw Township, Ayeyarwady Division. Then in 1986, the project was fully revived and hatchery was established.

Although Myanmar started sea turtle conservation since 1986 the momentum of the activity was not accelerated until. Myanmar became a member of Southeast Asian Fisheries Development Center (SEAFDEC) in 1999. As a member, Myanmar was able to participate in trainings and workshops related to conservation and enhancement of turtle conducted by SEAFDEC. Generally sea turtle conservation activities are conducted in collaboration and with the assistance of Southeast Asian Fisheries Development Center (SEAFDEC).

Since September 2001 the turtle conservation activities have been enhanced as the collaboration with International agencies and organizations are extended. The Memorandum on “Understanding on Conservation and Management of the Marine Turtle and their Habitats of Indian Ocean and South-East Asia” IOSEA (MoU) was signed between DOF Myanmar and IOSEA.

At present, Myanmar is being cooperated and collaborated with institution namely ASEAN-SEAFDEC, IOSEA (MoU), and Indian Ocean Turtle Newsletter (IOTN).

Currently in Myanmar, Department of Fisheries (DOF) has sighted at least 35 nesting sites in areas along the coastal region. Among those, seven are closely conserved by undertaking monitoring and surveillance of turtles landing sites, clutches and magnitude of hatchling enable to return to the sea.

Department of Fisheries also conducts turtle hatching activity in two types; (1) hatching in their original natural nests, (2) hatching at man-made nests by transplanting.



Ayeyarwady delta area, Rakhine coastal area, Mon coastal area and Tanintharyi coastal area. The sea turtle species recorded in Myanmar are loggerheads (*Caretta caretta*), green turtles (*Chelonia mydas*), hawksbills (*Eretmochelys imbricata*), olive ridleys (*Lepidochelys olivacea*), and leatherbacks (*Dermochelys coriacea*).

Thameehla Island is major nesting site of green turtles in Ayeyarwady delta. In Tanintharyi coastal and Ayeyarwady delta area, the first batch of nesting turtles come up in October at night and large number of turtles are recorded in December, January and February. In Rakhine coastal area of Myanmar, hawksbill turtle (*Eretmochelys imbricata*) is predominant nesting species, while the predominant nesting turtle species in some parts of Tanintharyi coastal area and Ayeyarwady delta area is Olive ridley turtle (*Lepidochelys olivacea*). According to the descriptions of Win Maung and Win Ko Ko (2002), nesting sea turtles were observed in Myanmar waters.



Although Myanmar has many islands and sandy marine turtle banks, the Department of Fisheries is conducting marine turtle hatching and hatchling releasing program. Nevertheless since the law enforcement is so strong that illegal collecting of eggs and fishing turtle along the coastal region is efficiently protected.

Department of Fisheries (DoF) has initiated to carry out Sea Turtles Conservation and Management in Myanmar in 1986. Among the five species of sea turtles, all relevant data of three species such as green turtles (*Chelonia mydas*), hawksbills (*Eretmochelys imbricata*), olive ridleys (*Lepidochelys olivacea*) were recorded. In spite of having many islands and Turtle beaches only six turtle beaches are being carried out activities at present.

DoF had conducted turtle hatching based on conditions of rookeries in nesting areas. Hatching methods used as (a) Hatching in their original natural nests (In-situ) and Hatching in man-made nest after transferring the eggs from natural nests. (Transplanting) Some nest were excavated and transferred to incubate in selected sites (Hatcheries). Data collection on hatching of Turtles at original nest site was also carried out. Eggs of some turtle nests located in unfavourable environment were collected and incubated in hatcheries for later release as a conservation measure. Total egg laid number, unhatched and damaged egg number and hatchlings released were recorded .

Applicators and Inconel Tags were provided by Marine Fisheries Resources Development and Management MFRDMD under SEAFDEC so that research on sea turtles could be carried out using tagging technology. The Applicators and Inconel Tags (National Band and Tag Co., USA) .Tagging activity was carried out during the nesting seasons of sea turtles starting from 23 December 2001. Inconel tags series numbered with MM-0000 were used for each turtle and fixed

on both flippers (left and right flipper). In Myanmar, Turtle Conservation and Management Training Course were conducted in which theory and practical application of tagging activities was included. In 2004, Department of Fisheries distributed Tag Wanted Flyer in Myanmar language. Department of Fisheries has already received 200 of tag wanted poster from SEAFDEC-MFRDMD in October 2006 which was distributed at National Workshop on Marine Turtle Conservation and Management (In Commemoration of Year of Turtle – 2006). Objectives of tagging study is to be understand migratory routes, feeding ground , nesting ground, growth, population and survival.



Thameehla (Diamond) Island in Ngaputaw Township and Gayet Gyi Island and Kadongalay Island, Bogalay Township and Amatt Gyi Beach in Kwin Bauk village, Lapputa Township in Ayeyarwaddy, Tin Pann (Oyster) Island in Rakhine State and Long Lon Bok Island, Dawei Township in Thanintharyi Division are being carried out tagging activities at present.

In Coco Island and Thameehla Island 30 green turtle tissue samples each were obtained and dispatched to SEAFDEC/ MFRDMD for DNA analysis for population genetics according to the ASEAN-SEAFDEC collaboration programme. Also in Tin Pann (Oyster Island), Coco Island and Long Lon Bok Island eight Hawksbill turtle's tissues were collected and also handed over to MFRDMD for analysis. Tissues sample were collected according to the standard operation procedure (SOP) which supported by MFRDMD.

The public needs to be widely educated and informed for the conservation and protection of sea turtles. For this purpose Department of Fisheries distributes pamphlets and posters, inserting educational program in newspaper, magazines, journals television, radio talks.

The DOF was educated the fishermen and public living in the coastal areas on the conservation and protection of marine turtles by: i) distributed pamphlets and posters; ii) erected educational signboard at fish landing jetties and in the rural areas; iii) broad casted awareness programs both in Myanmar and English on radio and TV Conducted training ; and holding of talks. The DOF through its offices in State/Division/District/Township level is distributed questionnaires and Tag Wanted posters to the fishing communities in order to receive the feed back.

Number of sea turtle nests and total eggs laid on the beaches of conservation stations were recorded during the period from 1986 to 2015. Almost all turtles recorded in Myanmar were green turtles (*Chelonia mydas*), olive ridley turtles (*Lepidochelys olivacea*), leatherback turtle (*Dermochelys coriacea*) hawksbill turtles (*Eretmochelys imbricata*) and logger head turtle (*Caretta carretta*).

The nest numbers recorded from 1986 to 2008 were different among the years indicating the fact that the population of the nesting turtles was fluctuating.

In Myanmar, sea turtles could be tagged with inconel tag.

As preservation of sea turtles in Myanmar waters and their prosperity depend on the interest and the participation of the people, education program have been initiated targeting the fishery communities and the local people along the coastline.

The DOF is finding difficulties in getting the feed back from fishing vessels and fishing villages regarding the marine turtles because of: i) Inaccuracy of the feedback; ii) Holding back what they knew (being afraid that action will be taken against them according to existing Laws and regulations); iii) Insufficient transportation equipment; and iv) The fishing vessel owners and the fishermen are placing their personal interests in the frontline.

The Laws banned Marine Turtle Products and Trade such as turtle's meat, eggs and carapace. However collecting, eating and marketing of eggs illegally are still being existed in remote areas.

Some villager and fishermen inform that when they caught the turtle in their fishing net they tried to release turtles back into the sea. If turtles died eat the meat and sell the carapace to the market.

The most valuable carapace is that of Hawksbill Turtle, because its shells are using in making ornamental apparatus such as combs, hair pans and brooches. It was learnt that in some border areas turtle products are still being traded illegally.

Constraints for Sea Turtle Conservation and Managements are: i) inadequacy of man power; b) difficulty to control and educate eggs poachers in remote areas; iii) Communication and transportation problem in reaching rookeries in remote areas; iv) requirement of modern equipment and materials; v) need of research methodology and research equipment; vi) poor trained person and literatures; vii) weakness in feedback system and information; viii) Need for more cooperation and collaboration with government agencies and other organization which are involved in Wildlife Conservation.; and ix) Insufficient technical experience and expertise.

The public needs to be widely educated and informed for the conservation and protection of sea turtles. For this purpose Department of Fisheries distributes pamphlets and posters, inserting educational program in newspaper, magazines, journals television, radio talks. As preservation of sea turtles in Myanmar waters and their prosperity depend on the interest and the participation of the people, education program have been initiated targeting the fishery communities and the local people along the coastline.

Sea turtles are incidentally caught and injured during the fishing activities. DoF has also prohibited the use of fishing gears having harmful affects on sea turtles that measure are being well encouraged. It is important that fishery workers invented and learnt to use a type of fishing gear, which will be effective in catching fish but harmless for turtles.

Some villager and fishermen inform that when they caught the turtle in their fishing net they tried to release turtles back into the sea. If turtles died eat the meat and sell the carapace to the market. Moreover, fishermen have been instructed to release back sea turtles unharmed if turtles are caught accidentally in their fishing gears.

The large-scale turtles mortality is the result of incidental catch in fishing gears. To counteract these arguments quantitative information or observed captures on sea turtles and the rate of mortality of these individual offshore fishing operations is absolutely essential. In the interim, strict enforcement of Myanmar Marine Fisheries Law (1990), which prohibits any kind of mechanized fishing within five miles(in Rakhine) and 10 miles (in Ayeyarwaddy and Tanintharyi) of the shore along the coast, is needed. A blanket ban on near shore-mechanized fishing should be significantly reduced the turtle mortality. In Myanmar there is no intentional catching of marine turtles in the sea.

The fishermen and their families living near the turtle conservation stations of DOF, on the other hand reported to DOF and released the turtles which are captured incidentally after treating them showing their cooperation with DOF .As an incentive to small scale fishermen who cooperate in marine turtle conservation and volunteer, the DOF has allowed them to fish without license.

Although DOF is carrying out the marine turtle conservation through many difficulties it is also (with whatever source available) is protecting the decreases in population of marine turtles because of death and injury caused by the fishing activities. One of the main factors which causes decrease in population of marine turtles is the fishing activities in the sea and draw the awareness of the importance of marine turtles organize the people living in the coastal areas to cooperate in conservation activities, in order to know the population of the marine turtles.

The use of TEDs alone will not be mitigating turtle mortality resulting from fisheries. Additional factors, which must be considered, are that in areas of high fishing intensity, turtles that are captured and released several times may die and turtles are also caught and drowned in gill nets. Therefore strict enforcement of the existing law, prohibiting near shore-mechanized fishing seems to be the best short-term solution to reduce turtle mortality.

DOF understanding the importance of marine turtles will continue to carry out the activities such as: i) organizing the concerned people to cooperate in the conservation activities: ii) collect data on population; and iii) to get feed back from the different levels in the coastal areas.

In offshore fisheries trawls, gill nets, purse seines, stowed nets, long-lines and traps are common in Myanmar. In inshore fisheries purse seines, stowed nets, drift gill nets, trammel nets and traps are used. In case of local fisheries beach surrounding nets, drift gill nets, trammel nets and traps are commonly utilized.

As there are cases of marine turtle being incidentally caught and injured during the fishing season there are cases of killing and consuming of marine turtles which come to take shelter because of adverse weather conditions. Eggs are also poached and consumed.

In some areas the fishermen believe that killing and eating of turtle meat can have adverse effect on their income, consider unlucky and mishaps could befall them.

To enhance effective conservation activities, the Ministry of Agriculture, Livestock and Irrigation prohibit the catching, killing and any other forms of harmful behaviors towards sea turtles, not only on noted turtle islands but also along the Myanmar coastline. Conservation activities such as protection from human disturbance, illegal harvest and hunting were conducted Ministry of Agriculture, Livestock and Irrigation. In addition to these activities, artificial incubation for later release of the hatchlings was made to increase the survival rate of sea turtle hatchlings. In addition to this a notification has been issued on (20-2-1986) prohibiting the digging, transporting, carrying, storing and marketing of turtles, eggs and their habitats.

The Department of Fisheries, Ministry of Agriculture, Livestock and Irrigation with the aim to protect more effectively against the extinction of marine turtles, has notified coastal regions along the Myanmar coastline as sanctuaries for sea turtles.

Although the DOF is exerting best effort in the conservation of marine turtles, there are lots of challenges in implementing the restriction because of lack of experts in this field and equipment and strong legislation measures in remote areas.

Ayeyarwady Dolphin Conservation Conducted by Department of Fisheries in Ayeyarwady River

Ayeyarwady (Irrawaddy) River is one of the biggest rivers in Southeast Asia, and it's the most dominant feature in Myanmar (Burma). This arises from Northern hill streams and through steep gorges upstream of Bhamo, and then flow the entire length of country, for approximately 2,200 km, before the reaches of Andaman Sea.

The 19th century naturalist John Anderson described Ayeyarwady (Irrawaddy) dolphin in the Ayeyarwady Rivers as morphologically distinct from *Orcaella brevirostris*.

The Department of Fisheries (DoF) established and defined as protected area for Ayeyarwady dolphin (72 km) river segment between Min Gun in Mandalay Region and Kyauk Myaung in Sagaing Region.



The Ayeyarwady dolphin conservation team conducted patrolling within the protected area twice a month and also conduct educational program in the protected area to prevent illegal fishing techniques and fishing gears which can harm the dolphin and fishes along the river. During the survey, the team distributed produced posters and pamphlets for awareness and educational purposes regarding Ayeyarwady dolphin and conservation activities to the local communities who live along the both river side. The Conservation team provided souvenir things such as; Ayeyarwady Dolphin T - Shirt, pencil, Ball pen, note books, etc to the students from 60 villages of protected areas.

The Ayeyarwady dolphin conservation team supported Rohu (*Labeo rohita*) species fish fingerlings and also provided fish pellet to culture the fish for 3 months. After 3 months, some fishes were released into the protected area in Ayeyarwady river segment, and purposes for enhancing freshwater fishery resources.

Wildlife Conservation Society (WCS) staff in collaboration with the Department of Fisheries staffs conducted the Ayeyarwady dolphin monitoring, surveillance and visual boat-base survey, and the team always identified and estimated the population and group size and threats to the dolphins between the Mandalay in Mandalay Region to Bahmo in Kachin State every year.

WCS in collaboration with DOF for observing the Ayeyarwady dolphin and conducted workshops regarding village-based eco-tourism.

In Myanmar, interesting tourists can study and enjoy cooperative fishing activities with Ayeyarwady dolphin and cast-net fishermen as a eco-tourism development. During the open season, at the upper reaches of the Ayeyarwady river, the cast net fisherman who conduct cooperative fishing practices cooperation with dolphin, it is one of the famous fishing practices in Myanmar.

A wide range of research and conservation activities have been implemented in the protected area under a guidance of Department of Fisheries.

A wide range of research and conservation activities are implementing in the protected area under the guidance of Department of Fisheries. Regarding the proposed Letter of Agreement (LOA) for marine program, WCS will extent her conservation activities in collaboration with DOF.

Marine & Fresh Research and Conservation Section

The Marine Fishery Resources of Myanmar

Myanmar currently reports the largest marine fishery catch in the Bay of Bengal region and the importance of fisheries to both the economy and national food security are undisputable. The capture fishery sector contributes around 10 % to the Myanmar GDP and large part of the human population finds its livelihood in this sector.

Although the total marine catches are uncertain, estimates range as high as 1.3 –1.8 million tonnes per year.

The vision of the Fisheries Department of Myanmar is to

“Ensure a sufficiency of fish supplies not only for the present entire national people but also for future generations by conserving the fishery resources with sustainable fisheries...”

As part of this commitment, the Department of Fisheries has been cooperating with the Institute of Marine Research of Bergen (IMR), FAO NORAD, the Bay of Bengal Large Marine Ecosystem Project (BOBLME) and the Nansen Survey Programme, to assess the status of marine capture fishery resources in the Myanmar EEZ.

This policy brief summarises the results of two marine fishery/ecosystem surveys conducted in Myanmar during 2013 and 2015 and the main findings and recommendations that emerged from the analysis of the data and the post-survey results workshops.

Background to the Nansen Surveys

The first assessment of the state of the fishery resources of Myanmar was conducted through two surveys during 1979-1980, using the RV *Dr. Fridtjof Nansen*¹. The results from those two surveys were used as the basis to estimate a Maximum Sustainable Yield (MSY) for the marine fisheries of the Myanmar EEZ.

The MSY is the maximum level of catch that can be sustained by the fishery. If this catch level is exceeded, the fishery will decline and so will the sustainable yield. After more than 30 years, the RV *Dr. Fridtjof Nansen* returned to Myanmar and conducted two more surveys (in 2013 and 2015) to update those earlier assessments.



Figure 1. Research Vessels of Dr. *Fridtjof Nansen*

Two workshops were held to present the results of these last two surveys to Myanmar authorities and stakeholders. Both surveys have been planned and executed in close collaboration with the DoF, Myanmar, the BOBLME (for the 2013 survey), the Marine Science Department (Mawlamyine and Myeik universities)

Objectives of the Nansen Surveys

The 1979-80 surveys aimed at obtaining an estimate of the marine standing stock biomass within Myanmar EEZ, as the basis to estimate sustainable yields.

Environmental work included recording type of bottom and hydrographic conditions. Both the 1979 -1980 and 2013-2015 surveys covered the pre-monsoon and post-monsoon seasons. This was intended to account for major seasonal variations in fish abundance. For the 2015 and 2015 surveys, the objectives were expanded to include more comprehensive ecosystem-related data. This included:

- ◆ Distribution, abundance and biodiversity of fish (pelagic and demersal)
- ◆ Size distribution, further biological information and genetic material from selected species
- ◆ Distribution, abundance and composition of phyto- and zooplankton, fish eggs and larvae
- ◆ Environmental conditions in the survey area (temperature, salinity, oxygen, chlorophyll, nutrients and sediments)
- ◆ Bathymetric mapping
- ◆ Sampling of benthic communities, infauna and macrofauna
- ◆ Determination of sediment composition and chemical analysis (heavy metals and hydrocarbons)

Main Findings of the 2013-2015 surveys

Both survey periods showed important seasonal variations in hydrographic conditions over the whole survey area. This affects fish distribution patterns and these changes are well known to the fishery. This does result in differences in the biomass estimates between the pre and post - monsoon seasons.

The seasonal differences were much less significant than the major decline observed in biomass of both pelagic and demersal fish when compared with the results of the 1979-1980 surveys.

A considerable increase in abundance of jellyfish was observed in 2015 and this was not recorded in any of the previous surveys.

Pelagic Fish abundance

The average pelagic biomass estimated in the 1979-1980 surveys was about 1 million tonnes. The average pelagic standing stock biomass estimated from the 2013 and 2015 in Myanmar waters was estimated at only 190 000 tonnes. The updated pelagic biomass estimates represent an 80% decrease from the 1970-1980 estimated biomass.

Demersal Fish Abundance

The average demersal biomass estimated in the 1979-1980 surveys was about 750,000 tonnes. The average demersal standing stock biomass in the 2013-2015 survey was estimated at 320 000 tonnes. The updated demersal biomass estimates represent a 50% decrease from the 1970-1980 estimated biomass.

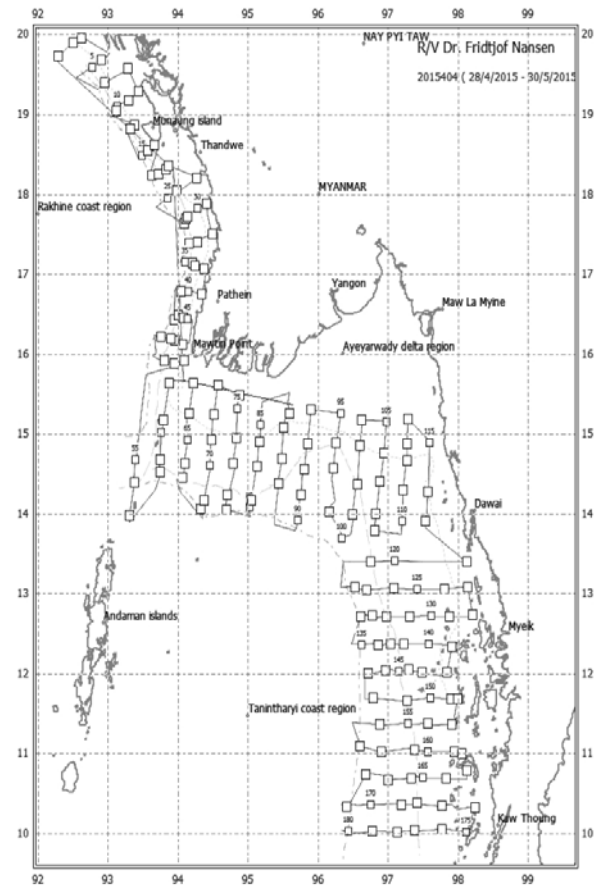


Figure 2. Course track with bottom (□) and pelagic (Δ) trawl stations. The 50 m, 100 m and 500 m depth contour is indicated. The red lines indicate

Changes in Species Composition

The species composition of the demersal (trawl) catch was compared. The results show that there has been a significant reduction in the most valuable commercial species (threadfin bream, croakers, sea catfish, snappers). There has also been a significant increase in smaller fast recruiting, less valuable species. This is a typical indication of over-fishing.

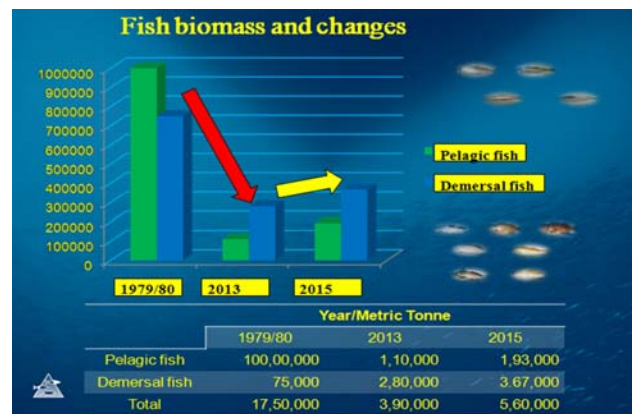


Figure 3. Change in fish abundance

RECOMMENDATIONS

- ✓ Consistent with the Myanmar Vision, management actions and policies should be directed to rebuilding stocks.
- ✓ Current yields, based on standing biomass of demersal and pelagic stocks are well below the fishable yield of the 1970's.
- ✓ The target would be to rebuild pelagic and demersal stocks to at least the level of the early 1970s.
- ✓ In order to achieve this target, the total allowable catches should be in the order of about 100 000 t. (pelagic + demersal).
- ✓ A combination of management measures to reduce fishing effort are required achieve this target.

These measures must also be:

- Possible to implement
- Cost effective
- Acceptable by stakeholders
- Balanced with respect to short term social and economic impacts and longer term benefits to economy, environment and employment

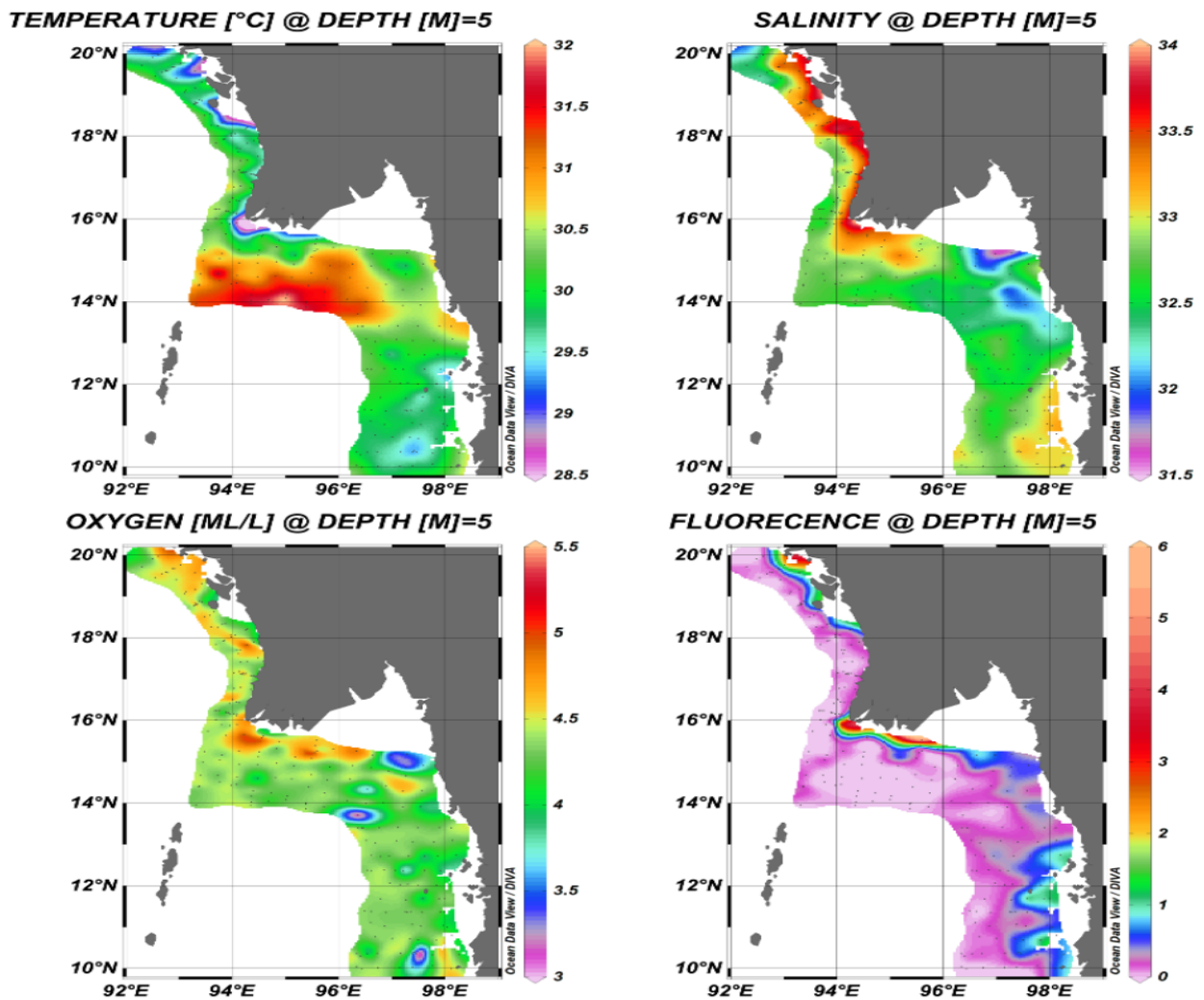


Figure 4. Horizontal near-surface (5 m depth) distributions of temperature, salinity, oxygen and fluorescence for the whole Myanmar coastal area. Station positions are indicated as black dots. Produced with the software Ocean Data View (v 4.7.2), interpolating by DIVA gridding (Ocean Data View, Schlitzer, R., <http://odv.awi.de>, 2015).

Research and Development Training Supervision Section

Department of Fisheries (DOF) is responsible for the development of fishery sector of the Union of Myanmar and the responsibilities of DoF for development and management in fisheries are as follow:

- ◆ Conservation and rehabilitation of fisheries resources
- ◆ Promotion of fisheries research and surveys
- ◆ Collection and compilation of fisheries statistic and information
- ◆ Extension services
- ◆ Supervision services
- ◆ Sustainability of fishery resources

In order to implement above responsibilities, DoF has established three fisheries training centers namely.

- ◆ Institute of Fisheries Technology, (Gyogone, Yangon Region)
- ◆ Pyapone Fisheries Training Center, (Ayeyarwady Region) and
- ◆ Upper Myanmar Fisheries Training Center (Sagging Region)

Human resource development in fishery sector and capacity building are carrier out through the training centers. In the year 2015-2016, nine training courses have been successfully conducted associated the fields of Aquaculture, Fisheries Management , Post Harvest Technology, Fishing Gear and English Specking and Computer: totally 606 trainees have been acquired knowledge of fisheries relevant fields. The various training for fishery taskforce skill development in (2015-2016) fiscal year.

No	Training Course	2015-2016		Remarks
		No of Course	No of Training	
1.	Aquaculture	12	353	DoF Training Center (Sagging, Pyapon); Fresh Water Hatchery (Butheetoung, Thayerkone)
2.	Water Quality and disease control Trainee	1	17	DoF Training Center (Pyapon)
3.	English speaking & Computer	5	86	DoF Training Center (Sagging,Pyapon, Institute of Fisheries Technology (Gyogone)
4.	On-site Training	1	18	DoF Training Center (Sagging)
5.	On-site Training	1	25	Pago DoF
6.	Good Aquaculture Practices Compliance and Traceability	2	33	Yangon Regional office
7.	Training on Improved Small-Scale Post harvest Fisheries	1	30	Ayeyarwady Division Bocalay
8.	Fishing Gear Training	1	22	DoF Training Center (Pyapon)
9.	Basic Fishing Sailor Training	1	22	Institute of Fisheries Technolog (Gyogone)
	Total	25	606	

Currently ,Development of Fisheries, Research & Training is going to conducts the project namely: “Small-scale Fisheries and Aquaculture in Myanmar: Institutional Support for the Dissemination of the European Regulation and the Mediterranean Best Practices” in Institute of Fisheries Technology (IFT, Yangon) by the support of Italian Development Cooperation with the Technical Support of CIHEAM Bari Institute, Italy, with Euro 680000 for one year project in order to upgrade IFT and support fisheries institution in Myanmar. The expected project outcome is that IFT become “Research & Extension Hub”.

Also IFT Yangon is conducted the vocational training collaborative with the International Trust and Business Co.Ltd in order to produce quailed sailors. The trainees will get the knowledge and awareness of International Fisheries Law, Sea law so that they can work in local and international fishing vessels.

International Relations and Projects Section

By the Invitation of the International, Regional Organizations and Partner Countries, DOF Staffs had participated in the meetings, workshops, seminars and trainings in other countries and the experiences and knowledge gained from those events will contribute the objectives of DOF in her continuing efforts towards achieving sustainable fisheries development for food security. The participated list of events was as follows;

No	Country	2015-2016					
		Training		Workshop/Meeting/ Seminar/Duty		Delegation/ Study Tour/ Trade Fair	
		Freq:	Person	Freq:	Person	Freq:	Person
1.	SEAFDEC	1	2	19	34	-	-
2.	FAO - SEAFDEC	-	-	-	-	1	4
3.	FAO -MMAF	-	-	1	1	-	-
4.	FAO	-	-	8	9	-	-
5.	BOBLME	-	-	1	2	-	-
6.	JICA	2	6	-	-	-	-
7.	TICA	2	4	-	-	-	-
8.	KOICA	-	-	1	4	-	-
9	NACA	-	-	2	2	-	-
10	FFI	-	-	-	-	1	1
11	OIE	-	-	1	1	-	-
12	MYfish	-	-	1	1	-	-
13	NTOU (National Taiwan Ocean University)	-	-	1	2	-	-
14	TVET Program	1	1	-	-	-	-
15	NAG - LIFT	-	-	1	2	-	-

No	Country	2015-2016					
		Training		Workshop/Meeting/ Seminar/Duty		Delegation/ Study Tour/ Trade Fair	
		Freq:	Person	Freq:	Person	Freq:	Person
16	Taiwan (ICDF)	-	-	-	-	1	1
17	GIZ for CC and ASFU (SDC)	-	-	1	1	-	-
18	Pyoe Pin	-	-	-	-	2	12
19	Japanese Trust Fund V	-	-	1	2	-	-
20	ICFO	1	1	-	-	-	-
21	MPEA	-	-	1	1	-	-
22	CP Co; Ltd	1	1	-	-	-	-
23	ICDF	1	1	-	-	-	-
24	ACFS (National Bureau of Agriculture Commodity and Food Standard)	-	-	1	2	-	-
25	ESCAP	-	-	1	1	-	-
26	ERIA	-	-	2	2	-	-
27	US-ACTI	-	-	1	3	-	-
28	MCC Tangoing Group Co; Ltd	-	-	-	-	1	2
29	ARISE	-	-	1	1	-	-
30	Info fish	-	-	1	1	-	-
31	Gov of China	1	1	2	5	-	-
32	Gov of Korea	-	-	1	1	-	-
33	Gov Brazil	-	-	-	-	1	1
34	GOV of India	2	2	-	-	-	-
35	GOV of Italy	1	16	1	6	-	-
36	GOV of Indonesia	-	-	1	1	-	-
37	GOV of Japan	-	-	2	2	-	-
38	GOV of Myanmar	-	-	1	1	-	-
	Total	13	35	54	88	7	21

Ph.D Candidates of DOF at abroad

Qualified staffs of DOF have been studying in abroad for their capacity and after that whose will be performed in relative program.

No.	Name/Position	University	Duration	Graduation	Study Field
1.	Daw Htet Moe Win	PKNU International University	2013 March to 2017 March	Ph. D Candidates Fisheries Science	Health Evaluation on Oyster
2.	U Myat Thiha Saw	University of Tasmania (Austria)	14-1-15 To 31-12-17	B.Sc Marine Environment	Sustainable Economic Development (Including Agriculture and Food Security)
3.	Daw Khine Htet Htet Win	National Taiwan Ocean University	1-9-2014 to 31-7-2016	M. Sc Candidates	International Master's Program in Aquaculture Technology and Management
4.	U Htin Lin Aung	National Taiwan Ocean University	1-9-2014 to 31-7-2016	M. Sc Candidates	International Master's Program in Aquaculture Technology and Management
5.	Daw Wah Wah Phu	ICFO	27-8-15 to 27-8-17	M.Sc Candidates	Graduate course in fisheries
6.	Daw Su Su Mon	National Taiwan Ocean University	1-9-2015 to 31-7-2017	M.Sc Candidates	International Master's Program in Aquaculture Technology and Management

Department of Fisheries Cooperation with International Organizations

Within the Fiscal year, DOF has cooperated with FAO, JICA, BOBLME, WCS, ACIAR (World Fish Center) and SEAFDEC to implement the following Projects;

1. **“Sustainable small scale Fisheries and Aquaculture Livelihood in Coastal Mangrove Ecosystem (GCP/MYA /010/ITA)”project:** It is implementing by FAO with the support of Italy Government. The project has been Starting from June, 2010 to December , 2015 at 20 villages of Bogale township in Ayeyarwady Region (US\$ 1.75 Million) with the objective of strengthening the capacity of participating communities and supporting institutions in the target areas of the Ayeyarwady Delta to jointly plan and co-manage the implementation of sustainable and mangrove friendly small-scale aquaculture and fisheries. (Project Manager : U Maung Maung Lwin , Deputy Director) (Project Manager: U Saw Lah Paw , Deputy Director)

2. **“Small-scale aquaculture Extension for Promotion of Livelihood of Rural Community in CDZ Project” (SAEP II)** supported by JICA in Central Dry Zone from March , 2014 to March , 2019 , is focusing on small scale aquaculture in central dry area including Mandalay, Sagaing and Magway Regions . The project was formulated followed by the previous project of SAEP. The SAEP II in CDZ is expected to contribute to rural development and poverty alleviation through sound extension of small-scale aquaculture which provides alternative livelihood for farmers in Central Dry Zone.
3. **Bay of Bengal Large Marine Ecosystem Program (BOBLME) Project (2010 -2015)** is funded principally by the Global Environmental Facility (GEF), Norway, the Swedish International Development Agency, FAO, participating Governments and the National Oceanic and Atmosphere Administration (NOAA). Myanmar is one of the participating countries together with Maldives, India, Sri Lanka, Bangladesh, Thailand, Indonesia and Malaysia. The project with the development objective is to support the development of a Strategic Action Programme (SAP) whose implementation will lead to enhanced food security and reduced poverty for coastal communities in the BOB region, consistent and linked with a sustained resource base of good ecosystem quality. (Project Manager : Dr. Yin Yin Moe , Deputy Director)
4. **Ayeyarwaddy Dolphin Research and Protected Area Management Plan**, supported by WCS, from 2007 to 2017, along the Ayeyarwady River in Mandalay and Saging Regions is to protect and conserve the Ayeyarwady Dolphin. (Project Manager : Daw Thida Moe , Fishery Officer)
5. **Improving research and development of Myanmar’s inland and coastal fisheries” Project** (US\$ 2140, 799) is funded by ACIAR and commissioned by Worldfish Center, from 3 December 2012 to 30 November 2016, in Ayeyarwady Delta and Central Dry Zone. The objectives are to characterise the fisheries and aquaculture sectors in AD & CDZ, to identify, test and then demonstrate new approaches to increase productivity, efficiency, sustainability and equity in fisheries, to strengthen the capacity for Government, private sector and NGOs to carry out research & development in fisheries sector. (Project Manager :U Nyunt Win ,Deputy Director)
6. **Capacity Building to Improve Market Access for Fish and Fisheries Products TCP/MYA/ 3401(D) Project** (US\$ 0.298 Million) Supported by FAO from March 2012- June 2015 to improve the Capacity of stakeholders to implement hygienic practices throughout the value chain improved , to improve the Capacity of fish inspection laboratories to deliver services required for fish Inspection and certification improved and to regulate Fish inspection system of Myanmar harmonized with international requirements. (Project Manager : U Tin Wai , Deputy Director)

7. **Project for Development of Inland Fish Farming Technology : (US\$ 4.41 Million)**
funded by KOICA and to be implemented at Thayetkone Fisheries Station in Mandalay from 2014 to 2016. The objectives are
- To contribute to developing inland fish farming technology by introducing high quality inland fish farming operation technology in Myanmar
 - To enhance the capacity of human resources in the field of inland fish farming by sharing Korea's experience and skills
 - To strengthen the friendly bilateral relations and cooperation between the two countries in the inland fish farming area
 - To contribute the economic and social development in Myanmar through the successful implementation of the Project
8. **Collaborative program to support the conservation of marine and freshwater biodiversity in Myanmar:** Fauna & Flora International is collaborating with DoF (December 2014 to December 2019) to support the efforts of DoF in Conserving endangered freshwater species and ecosystems, and environmental services in Kachin and Tanintharyi Regions. And also conserving marine species and ecosystems and environmental services in Tanintharyi and Ayeywaddy Regions and Rakhine State.
9. **Small-Scale Fisheries and Aquaculture in Myanmar: Institutional Support for Dissemination of European Regulations and Mediterranean Best Practices (Italy):** CIHEAM is collaborating with DoF (September 2015 to September 2016 - 1year) to support General Objective of the project is to improve the efficiency (Capacity Building) of the Department of Fisheries /MLFRD, for sustainable and responsible management of natural resources and food security improvement.
10. **Promoting sustainable growth of aquaculture in Myanmar to improve food security and income for communities in the Ayeyarwady Delta and Dry Zone (MYFish-Culture - MYFC):** World Fish is collaborating with DoF Technical Assistant from the LIFT Learning and Innovation Fund over a 3 to 4 Years Period (May 2015 to December 2018) to support the focus on improving the incomes of small-scale producers and the food nutrition security of communities in the Ayeyarwady Delta Area and the Central Dry Zone.

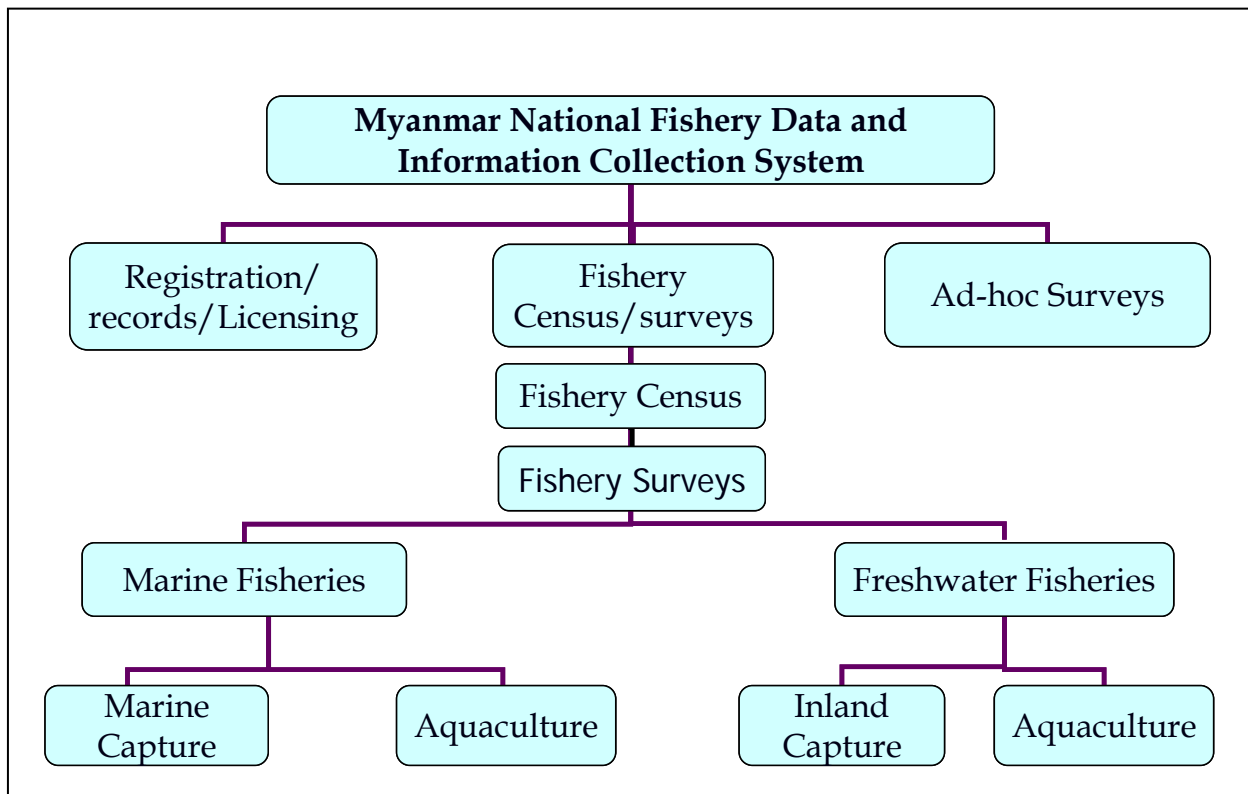
Planning ,Statistics and Rural Development Section

Fisheries statistics are not only a key component of a fisheries information system required for policy, planning, monitoring and management of fisheries but also a vital tool for knowing about the current and past status of fisheries and its trends on the development of the sector.

In major data collection fisheries statistics in Myanmar are three main sources of statistics, such as censuses, surveys and registration and licensing. The Ministry of Agriculture, Livestock and Irrigation is conducting the data collection, compilation, analysis and dissemination for fisheries and Livestock sector. The data collection in fisheries is implemented by the Department of Fisheries (DoF).

The objectives of fishery data collection

- (1) To fulfill the requirements of information for the users in relation to fishery sector;
- (2) To access and focus fisheries resources potential and productivity;
- (3) Prediction and planning to meet the sustainable fisheries;
- (4) Making policy and decision on fishery sector;
- (5) Formulating and developing essential processes for long-term monitoring and management.

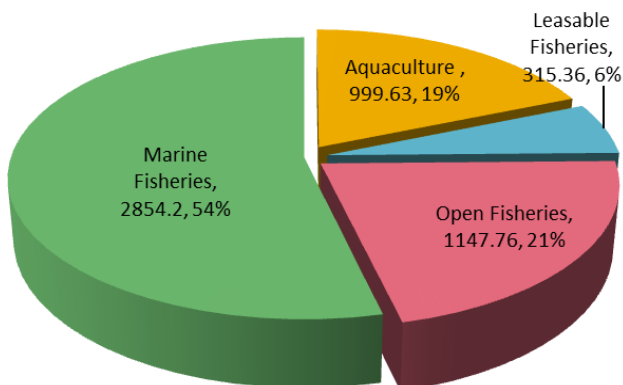


PART TWO
FISHERY STATISTICS

**Table.1. FISHERY PRODUCTION
(2006-2007) - (2015-2016)**

Thousand Metric Ton						
No.	Year	Total	Aquaculture	Leasable Fisheries	Open Fisheries	Marine Fisheries
1.	2006-2007	2859.86	616.35	170.10	548.09	1525.32
2.	2007-2008	3193.92	687.67	191.05	625.44	1689.76
3.	2008-2009	3542.19	775.25	209.72	689.71	1867.51
4.	2009-2010	3921.97	858.76	237.46	764.97	2060.78
5.	2010-2011	4163.46	830.48	250.04	913.12	2169.82
6.	2011-2012	4478.35	899.05	282.64	963.82	2332.84
7.	2012-2013	4716.22	929.38	290.00	1012.97	2483.87
8.	2013-2014	5047.40	964.12	304.44	1076.59	2702.25
9.	2014-2015	5316.95	999.63	315.36	1147.76	2854.20
10.	2015-2016(Prov:)	5591.83	1014.42	338.69	1241.98	2996.74

2014-2015



2015-2016

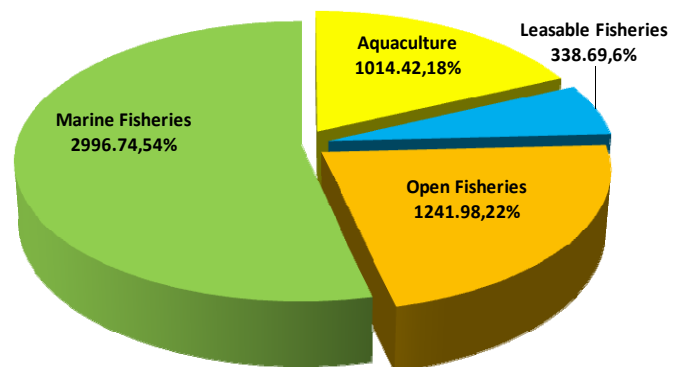


Figure1: Fishery Production (2014-2015) & (2015-2016)

Table.2. NUMBER OF FISHERS AND FISH FARMARS

			Unit: Number					
No.	Working domain	Working status	2010-11	2011-12	2012-13	2013-14	2014-15	
1.	Aquaculture	Full Time	123088	124751	125978	126219	126293	
		Part Time	88739	89694	90306	90481	90507	
		Status Unspecified	-	-	-	-	-	
		Occasional	-	-	-	-	-	
2.	Inland Water Fishing	Full Time	486300	486700	487000	488000	450000	
		Part Time	299500	300500	300000	301000	330000	
		Status Unspecified	785800	794000	796000	796500	796500	
		Occasional	-	-	-	-	-	
3.	Marine Coastal Fishing	Full Time	220000	223000	230000	230550	254000	
		Part Time	251000	254000	251000	252000	252000	
		Status Unspecified	-	-	-	-	-	
		Occasional	916000	921000	916000	917000	917000	
			Full Time	829388	834451	842978	844769	830293
			Part Time	639239	644194	641306	643481	672507
			Status Unspecified	785800	794000	796000	765000	796500
			Occasional	916000	921000	916000	917000	917000
		Total	3170427	3193645	3196284	3201750	3216300	

Table.3. TOTAL AQUACULTURE PONDS AND PRODUCTION

No.	Year	Area of Aquaculture Ponds (Acre)	Production of Aquaculture Ponds (Thousand Metric Ton)
1.	2006-2007	436825	616.35
2.	2007-2008	441098	687.67
3.	2008-2009	440585	775.25
4.	2009-2010	442702	858.76
5.	2010-2011	443695	830.48
6.	2011-2012	448468	899.05
7.	2012-2013	449692	929.38
8.	2013-2014	450324	964.12
9.	2014-2015	469153	999.63
10.	2015-2016(Prov:)	478002	1014.42

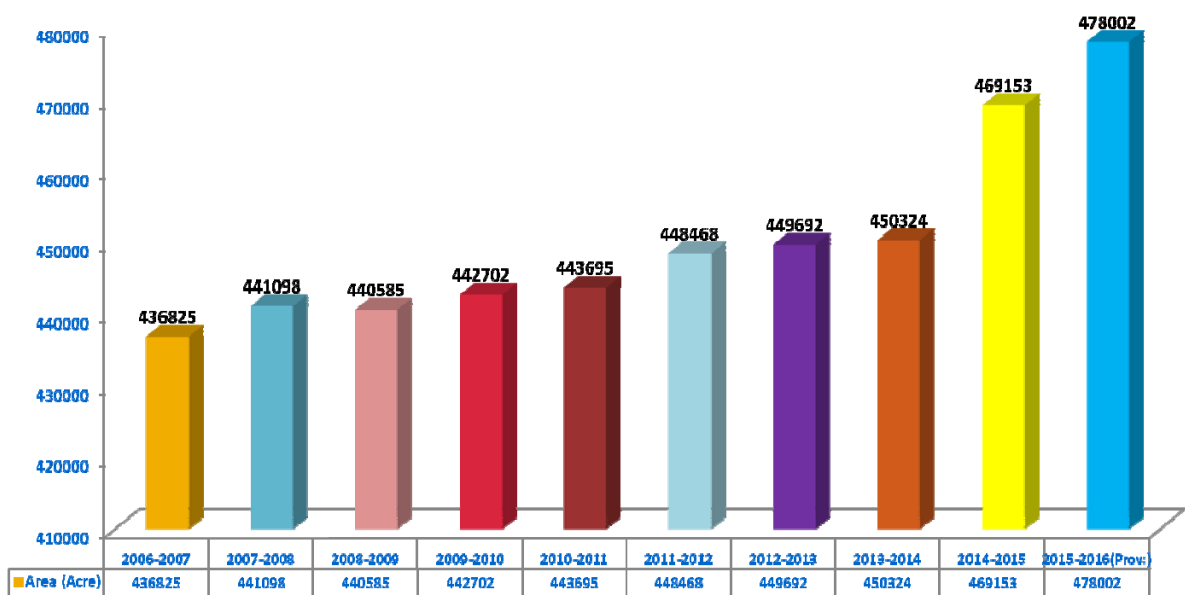
**Figure2: Area of Aquaculture Pond (2006-2007 to 2015-2016)**

Table. 4.TOTAL AREA OF AQUACULTURE PONDS

Unit - Acre

No.	Year	Area		
		Fish Pond	Shrimp Pond	Total
1.	2006-2007	212234	224591	436825
2.	2007-2008	215373	225725	441098
3.	2008-2009	215930	224655	440585
4.	2009-2010	217835	224867	442702
5.	2010-2011	218746	224949	443695
6.	2011-2012	220171	228297	448468
7.	2012-2013	221395	228297	449692
8.	2013-2014	222028	228296	450324
9.	2014-2015	232515	236638	469153
10.	2015-2016(Prov:)	239671	238331	478002

Table.5.1. AQUACULTURE POND BY STATES AND REGIONS

Unit-Acre

No.	States/ Regions	2006-2007			2007-2008			2008-2009		
		Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total
1.	Kachin	1154	-	1154	1222	-	1222	1408	-	1408
2.	Kayah	360	-	360	400	-	400	510	-	510
3.	Kayin	396	80	476	396	80	476	399	80	479
4.	Chin	100	-	100	101	-	101	101	-	101
5.	Sagaing	4435	-	4435	4569	-	4569	4569	-	4569
6.	Taninthayi	351	791	1142	329	791	1120	341	821	1162
7.	Bago	25570	12	25582	26354	12	26366	26276	12	26288
8.	Magway	417	-	417	419	-	419	419	-	419
9.	Mandalay	6224	-	6224	6205	-	6205	6411	-	6411
10.	Mon	842	1125	1967	848	1125	1973	884	1125	2009
11.	Rakhine	-	155533	155533	-	155533	155533	-	155533	155533
12.	Yangon	58527	10195	68722	59870	11329	71199	59835	10229	70064
13.	Shan	2305	-	2305	3107	-	3107	3268	-	3268
14.	Ayeyarwady	111553	56855	168408	111553	56855	168408	111509	56855	168364
15.	NayPyi Taw	-	-	-	-	-	-	-	-	-
	Total	212234	224591	436825	215373	225725	441098	215930	224655	440585

Table.5.2.AQUACULTURE POND BY STATES AND REGIONS

Unit-Acre

No.	States/ Regions	2009-2010			2010-2011			2011-2012		
		Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total
1.	Kachin	1492	-	1492	1938	-	1938	1910	-	1910
2.	Kayah	400	-	480	638	-	638	673	-	673
3.	Kayin	629	80	629	400	80	480	400	80	480
4.	Chin	101	-	101	108	-	108	107	-	107
5.	Sagaing	4794	-	4794	5159	-	5159	5465	-	5465
6.	Taninthayi	351	821	1172	351	821	1172	922	4141	5063
7.	Bago	25888	12	25900	25748	12	25760	26003	40	26043
8.	Magway	426	-	426	430	-	430	425	-	425
9.	Mandalay	6783	-	6783	6898	-	6898	7154	-	7154
10.	Mon	894	1125	2019	920	1125	2045	969	1125	2094
11.	Rakhine	-	155533	155533	-	155533	155533	-	155533	155533
12.	Yangon	59870	10229	70099	59870	10229	70099	59864	10229	70093
13.	Shan	3298	-	3298	3377	-	3377	3387	-	3387
14.	Ayeyarwady	112909	57067	169976	112909	57149	170058	112892	57149	170041
15.	Nay Pyi Taw	-	-	-	-	-	-	-	-	-
	Total	217835	224867	442702	218746	224949	443695	220171	228297	448468

Table.5.3. AQUACULTURE POND BY STATES AND REGIONS

Unit-Acre

No.	States/ Regions	2012-2013			2013-2014			2014-2015			2015-2016		
		Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total
1.	Kachin	1990	-	1990	2168	-	2168	2313	-	2313	2312	-	2312
2.	Kayah	748	-	748	760	-	760	798	-	798	819	-	819
3.	Kayin	464	80	544	464	80	544	589	80	669	675	130	805
4.	Chin	296	-	296	296	-	296	296	-	296	296	-	296
5.	Sagaing	5809	-	5809	6023	-	6023	6374	-	6374	7128	-	7128
6.	Taninthayi	922	4141	5063	923	4140	5063	1065	4140	5205	1120	4138	5258
7.	Bago	26009	40	26049	26014	40	26054	27158	40	27198	28324	40	28364
8.	Magway	425	-	425	425	-	425	425	-	425	425	-	425
9.	Mandalay	7416	-	7416	7624	-	7624	7609	-	7609	7970	-	7970
10.	Mon	969	1125	2094	975	1125	2100	979	1125	2104	995	1125	2120
11.	Rakhine	20	155533	155533	20	155533	155533	20	155533	155533	20	156488	156508
12.	Yangon	59864	10229	70093	59864	10229	70093	65848	17829	83677	66015	18442	84457
13.	Shan	3409	-	3409	3409	-	3409	3408	-	3408	3408	-	3408
14.	Ayeyarwady	112892	57149	170041	112892	57149	170041	115462	57892	173353	119993	57968	177961
15.	Nay Pyi Taw	162	-	162	171	-	171	171	-	171	171	-	171
	Total	221395	228297	449692	222028	228296	450324	232515	236638	469153	239671	238331	478002

Table. 6. THE PRODUCTION OF LEASABLE FISHERIES AND OPEN FISHERIES

No.	Year	Total amount of Leasable Fisheries (Number)	Production of Leasable Fisheries (MT-000)	Production of Open Fisheries (MT-000)	Total Production of Inland Fisheries (MT-000)
1.	2006-2007	3463	170.10	548.09	718.19
2.	2007-2008	3460	191.05	625.44	816.49
3.	2008-2009	3453	209.72	689.71	899.43
4.	2009-2010	3451	237.46	764.97	1002.43
5.	2010-2011	3458	250.04	913.12	1163.16
6.	2011-2012	3415	282.64	963.82	1246.46
7.	2012-2013	3409	290.00	1012.97	1302.97
8.	2013-2014	3290	304.44	1076.59	1381.03
9.	2014-2015	3304	315.36	1147.76	1463.12
10.	2015-2016(Prov:)	3312	338.69	1241.98	1580.67

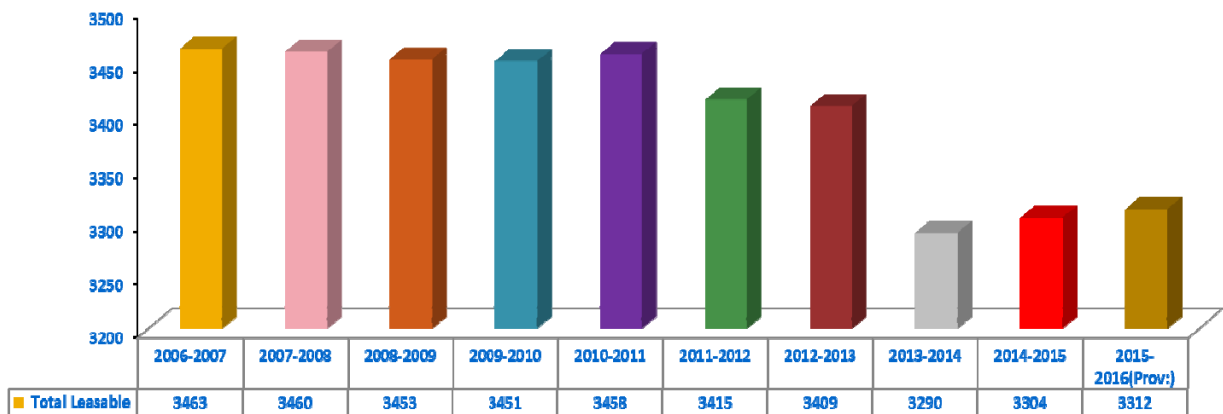
**Figure 3: Number of Leasable Fisheries in Myanmar (2006-2007 to 2015-2016)**

Table.7. FISHING VESSELS

Unit - Number

No.	Year	Small Fishing Boat		Off-shore Vessels		Total
		Powered Boat	Non-Powered Boat	National	Foreign	
1.	2006-2007	14284	16284	1871	206	32645
2.	2007-2008	14289	15219	1863	248	31619
3.	2008-2009	14025	14645	1746	356	30772
4.	2009-2010	13788	17054	2077	391	33310
5.	2010-2011	13823	15548	2196	396	31963
6.	2011-2012	12288	15463	2598	264	30613
7.	2012-2013	12157	12757	2724	150	27788
8.	2013-2014	12490	13732	2736	153	29111
9.	2014-2015	12240	13391	2840	52	28523
10.	2015-2016(Prov:)	13831	12583	3030	11	29455



Figure4: Number of Fishing Boats and Off –Shore Vessels

Table. 8.1. TYPE OF FISHING GEAR IN STATES AND REGIONS

Unit-Number

No.	Year	States and Regions	Trawl	Purse Seine	Drift net	Long line	Stick-held falling net	Trap	Total
1.	2006-2007	Head office	391	68	137	-	1	81	678
		Rakhine	2	-	-	-	-	6	8
		Taninthayi	334	54	-	2	22	75	487
		Ayeyarwady	-	-	526	-	-	-	526
		Mon	-	-	172	-	-	-	172
		Yangon	-	-	-	-	-	-	-
		Total	727	122	835	2	23	162	1871
2.	2007-2008	Head office	389	81	145	-	-	46	661
		Rakhine	5	-	-	-	-	4	9
		Taninthayi	376	71	1	1	19	101	569
		Ayeyarwady	-	-	464	-	-	-	464
		Mon	-	-	160	-	-	-	160
		Yangon	-	-	-	-	-	-	-
		Total	770	152	770	1	19	151	1863
3.	2008-2009	Head office	387	72	142	-	-	39	640
		Rakhine	-	-	-	-	-	-	-
		Taninthayi	416	87	2	2	21	62	590
		Ayeyarwady	-	-	373	-	-	-	373
		Mon	-	-	155	-	-	-	155
		Yangon	-	-	-	-	-	-	-
		Total	803	159	672	2	21	101	1758
4.	2009-2010	Head office	426	65	162	3	-	37	693
		Rakhine	6	-	-	-	-	-	6
		Taninthayi	482	100	2	-	35	67	686
		Ayeyarwady	-	-	544	-	-	-	544
		Mon	-	-	148	-	-	-	148
		Yangon	-	-	-	-	-	-	-
		Total	914	165	856	3	35	104	2077
5.	2010-2011	Head office	487	80	174	6	-	31	778
		Rakhine	5	-	-	-	-	-	5
		Taninthayi	512	88	-	-	29	66	697
		Ayeyarwady	-	-	567	1	-	4	572
		Mon	-	-	144	-	-	-	144
		Yangon	-	-	-	-	-	-	-
		Total	1004	170	885	7	29	101	2196

Table.8.2. TYPE OF FISHING GEAR IN STATES AND REGIONS

		Unit-Number							
No.	Year	States and Regions	Trawl	Purse Seine	Drift net	Long line	Stick-held falling net	Trap	Total
6.	2011-2012	Head office	549	86	167	6	-	29	837
		Rakhine	9	-	-	-	-	1	10
		Taninthayi	542	187	-	15	302	60	1106
		Ayeyarwady	-	-	503	2	-	3	508
		Mon	-	-	137	-	-	-	137
		Yangon	-	-	-	-	-	-	-
Total			1100	273	807	23	302	93	2598
7.	2012-2013	Head office	552	74	182	3	-	25	836
		Rakhine	7	3	-	-	-	1	11
		Taninthayi	564	201	-	32	356	64	1217
		Ayeyarwady	1	-	499	2	-	1	503
		Mon	-	-	148	-	-	-	148
		Yangon	1	-	7	1	-	-	9
Total			1125	278	836	38	356	91	2724
8.	2013-2014	Head office	23	5	5	-	-	2	35
		Rakhine	50	3	-	-	-	1	54
		Taninthayi	565	217	8	27	347	115	1279
		Ayeyarwady	-	-	411	1	-	1	413
		Mon	-	-	166	-	-	-	166
		Yangon	506	62	198	3	-	20	789
Total			1144	287	788	31	347	139	2736
9.	2014-2015	Head office	587	61	196	2	-	28	874
		Rakhine	2	3	-	-	-	3	8
		Taninthayi	578	219	1	25	327	104	1254
		Ayeyarwady	-	-	494	-	-	1	495
		Mon	-	-	209	-	-	-	209
		Yangon	-	-	-	-	-	-	-
Total			1167	283	900	27	327	136	2840
10.	2015-2016 (Prov:)	Head office	612	41	167	1	-	24	845
		Rakhine	-	2	-	-	-	4	6
		Taninthayi	628	241	3	33	351	99	1355
		Ayeyarwady	-	-	498	-	-	-	498
		Mon	-	-	326	-	-	-	326
		Yangon	-	-	-	-	-	-	-
Total			1240	284	994	34	351	127	3030

Table.9.FISHERY EXPORTS

Quantity - Metric Ton

Value - US \$ in Million

No.	Year	Fish		Prawns		Others		Total	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1.	2006-2007	237581.79	240.77	25511.04	121.70	80333.78	103.69	343426.61	466.16
2.	2007-2008	245473.15	315.46	21061.30	109.74	85117.60	135.82	351652.05	561.02
3.	2008-2009	234060.74	273.27	18382.10	88.85	72267.70	121.11	324710.54	483.23
4.	2009-2010	277823.74	309.86	17439.31	56.33	79829.38	130.40	375092.43	496.59
5.	2010-2011	273043.74	342.44	19142.91	68.66	81706.06	144.41	373892.71	555.51
6.	2011-2012	283688.76	396.27	17995.03	86.19	85297.53	171.39	386981.32	653.85
7.	2012-2013	266464.97	378.05	17267.93	89.29	93112.79	185.50	376845.69	652.84
8.	2013-2014	237142.31	286.93	16508.97	61.98	91616.08	187.36	345267.36	536.27
9.	2014-2015	225974.93	258.61	17527.33	56.89	94788.33	166.75	338290.59	482.25
10.	2015-2016	246970.93	274.25	13673.49	49.64	108326.47	178.74	368970.89	502.63

(Prov:)

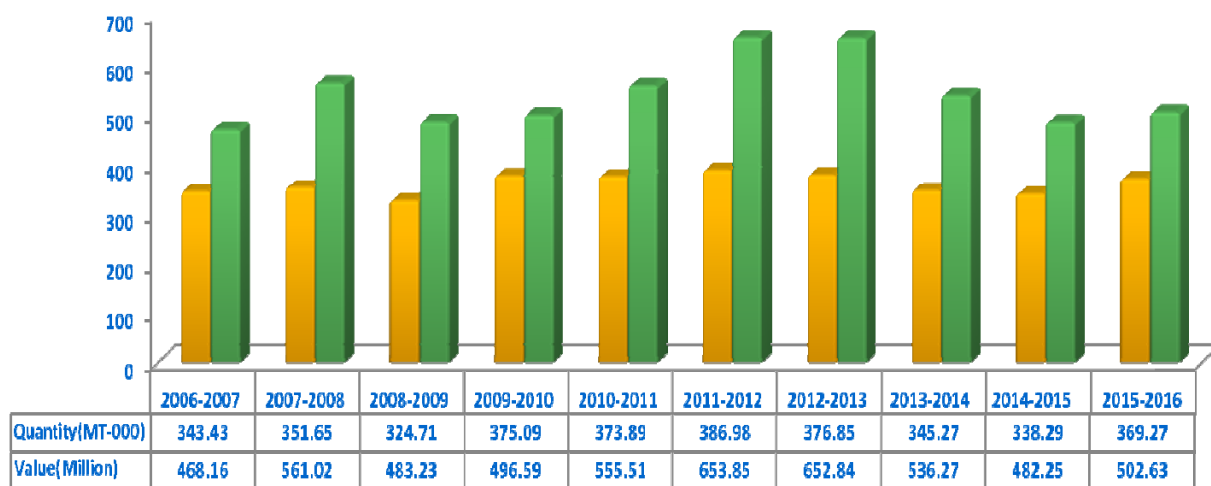












Figure 5: Fish and Fishery Product Exported in Myanmar (2006-2007 to 2015-2016)

**Table.10. TOP TEN SPECIES OF EXPORTED FISH AND FISHERIES PRODUCT OF MYANMAR
(2015-2016)**

No.	Species (Common Name)		MT(Ordinary)	US\$(Million)
1.	Rohu		59241.522	55.799
2.	Live Mud Crab		13629.602	39.552
3.	Live Eel		7222.102	24.986
4.	Soft Shell Crab		3151.416	21.340
5.	Fish Meal		28702.720	20.941
6.	Ribbon Fish		12600.873	20.644
7.	Pink		7785.515	18.364
8.	Tiger		3113.143	17.485
9.	Hilsa		7365.077	17.302
10.	Big Eye Croaker		9901.529	12.359

**Table.11.FISHERY PRODUCT EXPORTED BY TRADING COUNTRIES
(2015-2016)**

Quantity - Metric Ton
Value - US\$ in million

No.	COUNTRY	Fish		Prawn		Other		TOTAL	
		QTY	VALUE	QTY	VALUE	QTY	VALUE	QTY	VALUE
1.	China	23953.572	45.157	4872.679	14.020	49391.584	102.314	78217.835	161.491
2.	Thailand	123353.686	115.525	1554.068	7.243	24660.009	20.402	149567.763	143.170
3.	Malaysia	1871.263	2.299	1117.172	6.251	10693.794	25.683	13682.229	34.233
4.	Saudi	20540.771	21.609	11.720	0.020	309.547	0.594	20862.038	22.223
5.	Singapore	16301.349	22.410	402.859	1.269	10345.695	5.976	27049.903	29.655
6.	Kuwait	20947.345	19.711	3.500	0.007	35.794	0.075	20986.639	19.793
7.	Japan	81.890	0.153	3870.124	13.594	1419.318	3.578	5371.332	17.325
8.	UAE	13775.162	12.697	330.491	0.761	83.538	0.329	14189.191	13.787
9.	UK	6788.760	11.106	50.691	0.232	169.153	0.559	7008.604	11.897
10.	USA	2238.782	3.503	344.311	1.815	757.857	4.713	3340.950	10.031
11.	Bangladesh	4008.291	4.321	284.960	1.396	3847.196	2.564	8140.447	8.281
12.	Australia	386.629	0.901	9.373	0.013	585.721	3.301	981.723	4.215
13.	Qatar	3154.043	3.200	17.119	0.022	46.848	0.098	3218.010	3.320
14.	Hong Kong	65.393	0.206	554.458	2.083	205.730	2.348	825.581	4.637
15.	Omam	2457.538	2.421	4.297	0.007	10.240	0.020	2472.075	2.448
16.	Bahrain	2072.850	2.167	4.776	0.009	23.888	0.035	2101.514	2.211
17.	Vietnam	40.117	0.064	99.531	0.371	4551.365	3.353	4691.013	3.788
18.	Italy	1439.348	1.909	2.075	0.004	0.500	0.001	1441.923	1.914
19.	Korea	323.933	0.486	0.311	0.002	863.416	1.529	1187.660	2.017
20.	Canada	349.712	0.467	21.245	0.097	77.207	0.393	448.164	0.957
21.	India	781.067	1.639	-	-	20.000	0.015	801.067	1.654
22.	Pakistan	457.200	0.466	-	-	-	-	457.200	0.466
23.	Taiwan	-	-	-	-	110.780	0.505	110.780	0.505
24.	France	-	-	22.655	0.162	34.638	0.156	57.293	0.318
25.	South Africa	172.977	0.200	4.972	0.007	31.247	0.064	209.196	0.271
26.	Jordon	110.084	0.170	-	-	-	-	110.084	0.170
27.	Indonesia	-	-	43.578	0.122	8.500	0.013	52.078	0.135
28.	Greece	107.448	0.122	0.375	0.001	24.000	0.039	131.823	0.162
29.	Netherland	163.019	0.184	10.800	0.014	-	-	173.819	0.198
30.	Brunei	9.168	0.016	-	-	8.800	0.040	17.968	0.056
31.	Sweden	267.513	0.302	11.232	0.021	-	-	278.745	0.323
32.	Cyprus	9.800	0.011	5.752	0.035	-	-	15.552	0.046
33.	Lebanon	59.346	0.089	0.750	0.001	5.920	0.017	66.016	0.107
34.	Iraq	551.380	0.531	-	-	-	-	551.380	0.531
35.	Ireland	65.461	0.118	-	-	-	-	65.461	0.118
36.	Africa	24.271	0.029	0.380	0.001	0.190	0.001	24.841	0.031
37.	Germany	18.715	0.025	6.400	0.048	-	-	25.115	0.073
38.	Newzealand	-	-	0.002	0.000	-	-	0.002	-
39.	Fiji	-	-	-	-	4.000	0.024	4.000	0.024
40.	Philippine	-	-	10.800	0.009	-	-	10.800	0.009
41.	Belgium	23.050	0.040	-	-	-	-	23.050	0.040
42.	Switzerland	-	-	0.032	-	-	-	0.032	-
	Total	246970.933	274.254	13673.488	49.637	108326.475	178.739	368970.896	502.630

**Table.12.1.TOP TEN COUNTRIES EXPORTED FISHERY PRODUCTS FROM MYANMAR
(2006-2007 TO 2007-2008)**

Quantity - Metric Ton

Value - US \$ in Million

No.	2006-2007			2007-2008		
	Countries	Quantity	Value	Countries	Quantity	Value
1.	China	90197.08	130.662	1. China	84980.51	148.724
2.	Thailand	121764.99	109.880	2. Malaysia	80835.93	86.960
3.	Japan	12211.50	50.447	3. Singapore	32095.00	70.363
4.	Singapore	18362.08	30.434	4. Thailand	48820.83	55.985
5.	Bangladesh	23669.32	22.360	5. Japan	10523.96	42.085
6.	Malaysia	10288.51	21.103	6. Saudi	18798.08	35.146
7.	Saudi	18030.71	20.129	7. Kuwait	27895.32	30.026
8.	UAE	13993.72	17.528	8. Bangladesh	20229.72	27.003
9.	Kuwait	14981.31	14.427	9. UAE	9467.70	13.902
10.	Hongkong	4365.30	13.967	10. HongKong	3141.41	12.664

**Table.12.2.TOP TEN COUNTRIES EXPORTED FISHERY PRODUCTS FROM MYANMAR
(2008-2009 TO 2009-2010)**

Quantity - Metric Ton
Value - US \$ in Million

2008-2009				2009-2010			
No.	Countries	Quantity	Value	No.	Countries	Quantity	Value
1.	Singapore	56753.61	119.044	1.	China	55991.33	105.076
2.	China	58921.26	106.153	2.	Thailand	122817.59	99.229
3.	Thailand	89489.51	76.978	3.	Singapore	46424.56	96.257
4.	Malaysia	23004.36	41.260	4.	Kuwait	58747.92	52.964
5.	Kuwait	34423.65	31.844	5.	Malaysia	21351.10	36.127
6.	Japan	6514.06	23.400	6.	Saudi	20426.63	23.272
7.	Saudi	17702.42	21.344	7.	Japan	6215.54	16.908
8.	Bangladesh	14694.98	18.686	8.	UAE	13517.21	16.784
9.	UAE	10610.28	13.782	9.	Bangladesh	13993.34	16.257
10.	UK	5192.64	10.674	10.	UK	6285.68	12.427

**Table.12.3.TOP TEN COUNTRIES EXPORTED FISHERY PRODUCTS FROM MYANMAR
(2010-2011 TO 2011-2012)**

Quantity - Metric Ton
Value - US \$ in Million

2010-2011				2011-2012			
No.	Countries	Quantity	Value	No.	Countries	Quantity	Value
1.	China	77914.27	179.704	1.	China	92775.645	258.759
2.	Thailand	134634.31	110.595	2.	Thailand	136278.599	124.457
3.	Singapore	25413.33	59.378	3.	Malaysia	23325.904	53.623
4.	Kuwait	50643.82	56.683	4.	Kuwait	45496.48	51.155
5.	Malaysia	20669.93	39.419	5.	Singapore	15881.889	34.522
6.	Saudi	19474.26	24.673	6.	Japan	6839.415	30.361
7.	Japan	7197.15	21.882	7.	Saudi	20771.696	28.610
8.	UAE	12292.49	17.789	8.	Bangladesh	17296.858	23.124
9.	Bangladesh	11372.95	14.166	9.	UAE	16045.36	21.320
10.	UK	6488.43	13.085	10.	UK	6275.849	13.845

**Table.12.4.TOP TEN COUNTRIES EXPORTED FISHERY PRODUCTS FROM MYANMAR
(2012-2013 TO 2013-2014)**

Quantity - Metric Ton
Value - US \$ in Million

2012-2013				2013-2014			
No.	Countries	Quantity	Value	No.	Countries	Quantity	Value
1.	China	90780.734	244.249	1.	China	82665.926	199.290
2.	Thailand	137631.665	133.165	2.	Thailand	126645.544	128.980
3.	Singapore	26584.477	49.748	3.	Malaysia	16459.55	35.285
4.	Kuwait	34515.926	49.153	4.	Kuwait	26196.712	27.051
5.	Malaysia	19288.339	45.678	5.	Singapore	20086.003	25.220
6.	Japan	6895.203	34.971	6.	Saudi	19672.380	24.370
7.	Saudi	21738.835	31.806	7.	Japan	6490.001	23.511
8.	UAE	15142.596	19.424	8.	UAE	16008.274	18.271
9.	UK	6341.289	14.561	9.	UK	7123.743	13.839
10.	Bangladesh	9529.391	11.978	10.	Bangladesh	8190.575	8.500

Tale.12.5.TOP TEN COUNTRIES EXPORTED FISHERY PRODUCTS FROM MYANMAR
(2014-2015 TO 2015-2016)

Quantity - Metric Ton

Value - US \$ in Million

No.	2014-2015			No.	2015-2016		
	Countries	Quantity	Value		Countries	Quantity	Value
1.	China	75732.900	169.685	1.	China	78217.835	161.491
2.	Thailand	127537.529	127.75	2.	Thailand	149567.763	143.170
3.	Malaysia	16769.467	31.400	3.	Malaysia	13682.229	34.233
4.	Singapore	21453.699	22.959	4.	Singapore	27049.903	29.655
5.	Saudi	23689.382	22.353	5.	Saudi	20862.038	22.223
6.	Kuwait	23428.406	21.935	6.	Kuwait	20986.639	19.793
7.	Japan	6750.174	18.846	7.	Japan	5371.332	17.325
8.	UAE	13838.681	14.588	8.	UAE	14189.191	13.787
9.	UK	5654.002	10.189	9.	UK	7008.604	11.897
10.	Bangladesh	7602.536	9.013	10.	USA	3340.950	10.031

Table.13. FISH SUPPLY IN YANGON

Unit - Thousand Metric Ton

No.	Year	Production		
		Fresh Water	Marine	Total
1.	2006-2007	102.90	103.95	206.85
2.	2007-2008	91.28	143.83	235.11
3.	2008-2009	78.83	103.69	182.52
4.	2009-2010	91.39	132.47	223.86
5.	2010-2011	93.07	138.44	231.51
6.	2011-2012	97.67	152.94	250.61
7.	2012-2013	94.68	167.01	261.69
8.	2013-2014	135.04	166.42	301.46
9.	2014-2015	142.45	152.95	295.40
10.	2015-2016(Prov:)	127.56	159.46	287.02

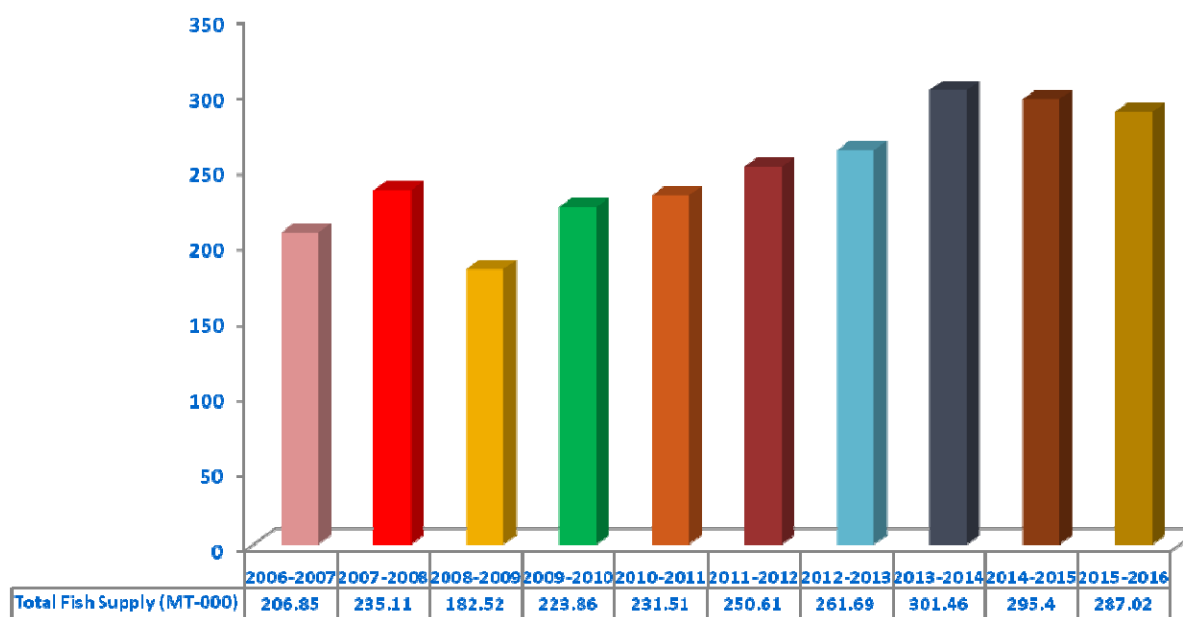


Figure 6: Fish Supply in Yangon (2006-2007 to 2015-2016)

Table.14. PER CAPITA FISH SUPPLY BY YEAR

No.	Year	Population (Million)	Production (Metric Ton)	Non-food use (Metric Ton)	Export (Metric Ton)	Per Capita Fish Supply (Kg)
1.	2015-2016 (Prov:)	52.45	5591835	1677550	368971	68

*In the above figure, the quantities of fish of non-food use is estimated in which it is included for using amount of animal feeds, processing waste from raw material to finished products, and for fish meal etc.,.

Table. 15.1. SEED PRODUCTION BY FISH HATCHERIES UNDER DOF

Unit: Million

No.	Myanmar Name	Common Name	Scientific Name	2006-07	2007-08	2008-09	2009-10	2010-11
1.	Nga Myit Chin	Rohu	<i>Labeo rohita</i>	529.740	541.823	530.733	527.260	460.179
2.	Shwe Wa Nga Gyin	Common Carp	<i>Cyprinus carpio</i>	57.927	70.870	56.783	77.370	83.882
3.	Myetsar Nga Gyin	Grass Carp	<i>Ctenopharyngodon idella</i>	8.034	6.336	5.881	4.170	8.397
4.	Nga Khaung Pwa	Catla	<i>Catla catla</i>	4.638	6.089	4.950	5.190	11.733
5.	Yaung Sone Nga Gyin	Colour Carp	<i>Carrasius spp:</i>	-	-	-	-	-
6.	Tilapia	Tilapia	<i>Tilapia spp:</i>	13.727	13.375	12.999	20.060	18.363
7.	Ngwe Yaung Nga Gyin	Silver Carp	<i>Hypophthalmichthys molitrix</i>	3.134	3.032	3.244	3.380	5.629
8.	Khaung Gyi Nga Gyin	Big Head	<i>Aristichthys nobilis</i>	2.639	2.110	2.300	2.190	3.8
9.	Nga Khu	Cat Fish	<i>Clarias batrachus</i>	1.803	-	-	-	-
10.	Nga Dan	Stripped Catfish	<i>Pangasius sutchi</i>	17.052	11.724	10.076	4.660	9.384
11.	Nga Phan Ma	Rohtee	<i>Rohtee alfrediana</i>	0.350	-	-	-	-
12.	Nga Gyin Phyu	Mrigal	<i>Cirrhina mrigala</i>	3.817	3.389	1.825	2.850	6.652
13.	Pa Cu (Ye Cho Nga Mote)	Fresh water pomfret	<i>Pirictus spp:</i>	15.302	9.339	10.809	3.290	6.733
14.	Nga Khone Ma	Tarpian	<i>Barbodes gonionotus</i>	37.095	75.293	68.712	86.230	181.439
15.	Nga Net Pyar	Black carp	<i>Labeo calabasu</i>	-	-	-	0.050	-
16.	Nga Thylene	Minor Carp	<i>Leabo Fdolizkae</i>	-	-	-	0.060	-
17.	Be Lar	Snakeskin gourami	<i>Trichogester pectoralis</i>	-	-	-	-	0.060
18.	Vietnam Nga Dan	Stripped Catfish	<i>Pangasius bacourti</i>	-	-	-	-	0.002
Total				695.258	743.380	708.312	736.760	796.253

Table.15.2. SEED PRODUCTION BY FISH HATCHERIES UNDER DOF

Unit - Million

No.	Myanmar Name	Common Name	Scientific Name	2011-12	2012-13	2013-14	2014-15	2015-16
1.	Nga Myit Chin	Rohu	<i>Labeo rohita</i>	535.409	549.201	384.861	397.569	419.600
2.	Shwe Wa Nga Gyin	Common Carp	<i>Cyprinus carpio</i>	49.223	45.579	41.914	38.751	35.981
3.	Myetsar Nga Gyin	Grass Carp	<i>Ctenopharyngodon idella</i>	3.833	13.400	5.598	5.483	5.378
4.	Nga Khaung Pwa	Catla	<i>Catla catla</i>	6.547	9.637	7.054	6.976	6.877
5.	Tilapia	Tilapia	<i>Tilapia spp:</i>	17.883	13.063	13.571	11.492	11.792
6.	Ngwe Yaung Nga Gyin	Silver Carp	<i>Hypophthalmichthys molitrix</i>	6.894	5.246	5.533	4.715	4.146
7.	Khaung Gyi Nga Gyin	Big Head	<i>Aristichthys nobilis</i>	3.539	2.305	2.785	2.203	2.830
8.	Nga Khu	Cat Fish	<i>Clarias batrachus</i>	0.050	-	-	0.001	-
9.	Nga Dan	Stripped Catfish	<i>Pangasius sutchi</i>	5.660	8.976	7.111	5.675	7.787
10.	Nga Phan Ma	Rohtee	<i>Rohtee alfrediana</i>	-	-	-	0.105	-
11.	Nga Gyin Phyu	Mrigal	<i>Cirrhina mrigala</i>	4.554	6.087	2.854	2.275	3.190
12.	Pa Cu (Ye Cho Nga Mote)	Fresh water pomfret	<i>Pirictus spp:</i>	3.690	7.633	5.569	7.325	8.265
13.	Nga Khone Ma	Tarpian	<i>Barbodes gonionotus</i>	112.761	127.863	73.478	89.541	100.879
14.	Nga Thylene	Minor Carp	<i>Leabo Fdolizkae</i>	-	-	-	-	-
15.	Be Lar	Snakeskin gourami	<i>Trichogester pectoralis</i>	0.020	-	-	-	0.170
16.	Vietnam Nga Dan	Stripped Catfish	<i>Pangasius bacourti</i>	-	-	-	-	-
17.	Nga Kye	Sconpion cat- fish	<i>Heteropneustcs fossilis</i>	0.300	0.250	0.100	0.050	0.100
18.	Nga Phane	Nga Phane	<i>Cyprinus intha</i>	0.003	0.218	0.353	1.651	1.103
19.	Sultan	Sultan Fish	<i>Leptobanbus ho-evenii</i>	0.004	-	0.060	-	-
20.	Nga Ohn Tone	Nandina	<i>Labeo nandina</i>	-	0.065	-	-	-
21.	Nga Dane	Kuria Labeo	<i>Labeo gonius</i>	-	0.100	-	-	0.050
22.	Taung Paw Nga Thar Lauk	Streaked prochilod	<i>Prochilodus lineatus</i>	-	-	0.565	1.600	0.550
Total				750.370	789.623	551.406	575.412	608.698

**Table.16.FISH HATCHERIES UNDER DOF
(2010-2011)**

			Unit - Million
No.	Fish Hatcheries	Location	Production
Yangon Region			186.762
1	Hlaw Kar	Mingalardone Township, Yangon.	101.801
2	Twante	Twante Township	44.490
3	Laydaukkan	Dagon(east) Township	40.471
Bago Region			68.228
4	Bago (Kali)	Bago Township	40.089
5	Thanappin	Thanappin Township	15.442
6	Oakpho	Oakpho Township	12.697
Mandalay Region			373.521
7	Pathein Gyi	Pathein Gyi Township	97.871
8	Myit Thar	Myit Thar Township	110.999
9	Natyekan	A-ma-ya-pu-ya Township	58.951
10	Pyinmanar	Pyin-ma-nar Township	78.660
11	Matayar	Ma-ta-yar Township	27.040
Ayeyarwady Region			101.779
12	Pathein	Pathein Township	20.893
13	Talotehla	Ma-u-bin Township	10.820
14	Hinthada	Hin-tha-da Township	9.631
15	Pantanaw	Pan-ta-naw Township	35.232
16	Aung hate	Ma-u-bin Township	25.203
Magway Region			8.584
17	Taungdwingyi	Magway Township	5.519
18	Pwint Phyu	Pwint Phyu Township	3.065
Kachin State			19.011
19	Waing-maw	Waing-maw Township	9.259
20	Bamaw	Bamaw Township	9.752
Sagaing Region			26.655
21	Shwe Bo	Shwe Bo Township	10.617
22	Yay Oo	Yay Oo Township	10.329
23	Htee chaint	Kalay Township	5.709
Mon State			5.129
24	Thahtone	Thahtone Township	5.129
Shan State			3.067
25	Nyaung Shwe	Nyaung Shwe Township	3.067
Kayin State			3.517
26	Pha aan	Pha-aan Township	3.517

**Table.17.FISH HATCHERIES UNDER DOF
(2011-2012)**

			Unit - Million
No.	Fish Hatcheries	Location	Production
Yangon Region			180.268
1	Hlaw Kar	Mingalardone Township, Yangon.	81.844
2	Twante	Twante Township	47.555
3	Laydaukkan	Dagon(east) Township	50.869
Bago Region			69.665
4	Bago (Kali)	Bago Township	39.964
5	Thanappin	Thanappin Township	15.156
6	Oakpho	Oakpho Township	14.545
Mandalay Region			314.509
7	Pathein Gyi	Pathein Gyi Township	82.420
8	Myit Thar	Myit Thar Township	77.225
9	Natyekan	A-ma-ya-pu-ya Township	37.111
10	Pyinmanar	Pyin-ma-nar Township	100.070
11	Matayar	Ma-ta-yar Township	17.683
Ayeyarwady Region			128.953
12	Pathein	Pathein Township	25.896
13	Talotehla	Ma-u-bin Township	15.252
14	Hinthada	Hin-tha-da Township	13.010
15	Pantanaw	Pan-ta-naw Township	47.436
16	Aung hate	Ma-u-bin Township	27.359
Magway Region			7.532
17	Taungdwingyi	Magway Township	4.582
18	Pwint Phyu	Pwint Phyu Township	2.950
Kachin State			13.630
19	Waing-maw	Waing-maw Township	8.089
20	Bamaw	Bamaw Township	5.521
21	Putao	Putao Township	0.020
Sagaing Region			23.987
22	Shwe Bo	Shwe Bo Township	5.353
23	Yay Oo	Yay Oo Township	11.814
24	Htee chaint	Kalay Township	6.820
Mon State			6.713
25	Thahtone	Thahtone Township	6.713
Shan State			2.915
26	Nyaung Shwe	Nyaung Shwe Township	2.915
Kayin State			2.197
27	Pha aan	Pha-aan Township	2.197

**Table. 18. FISH HATCHERIES UNDER DOF
(2012-2013)**

			Unit - Million
No.	Fish Hatcheries	Location	Production
	Yangon Region		177.925
1	Hlaw Kar	Mingalardone Township, Yangon.	80.445
2	Twante	Twante Township	37.638
3	Laydaukkan	Dagon(east)Township	59.842
	Bago Region		74.165
4	Bago (Kali)	Bago Township	40.343
5	Thanappin	Thanappin Township	17.098
6	Oakpho	Oakpho Township	16.724
	Mandalay Region		290.901
7	Pathein Gyi	Pathein Gyi Township	87.519
8	Myit Thar	Myit Thar Township	99.661
9	Natyekan	A-ma-ya-pu-ya Township	78.626
10	Matayar	Ma-ta-yar Township	25.095
	Nay Pyi Taw		56.296
11	Pyinmanar	Pyin-ma-nar Township	56.296
	Ayeyarwady Region		127.650
12	Pathein	Pathein Township	20.702
13	Talotehla	Ma-u-bin Township	15.981
14	Hinthada	Hin-tha-da Township	11.918
15	Pantanaw	Pan-ta-naw Township	54.355
16	Aung hate	Ma-u-bin Township	24.694
	Magway Region		10.657
17	Taungdwingyi	Magway Township	5.279
18	Pwint Phyu	Pwint Phyu Township	5.378
	Kachin State		16.736
19	Waing-maw	Waing-maw Township	9.866
20	Bamaw	Bamaw Township	6.870
	Sagaing Region		21.375
21	Shwe Bo	Shwe Bo Township	6.452
22	Yay Oo	Yay Oo Township	10.293
23	Htee chaint	Htee chaint Township	4.630
	Mon State		7.101
24	Thahtone	Thahtone Township	7.101
	Shan State		4.818
25	Nyaung Shwe	Nyaung Shwe Township	4.818
	Kayin State		1.999
26	Pha aan	Pha aan Township	1.999

**Table.19. FISH HATCHERIES UNDER DOF
(2013-2014)**

			Unit - Million
No.	Fish Hatcheries	Location	Production
Yangon Region			141.582
1	Hlaw Kar	Mingalardone Township, Yangon.	59.329
2	Twante	Twante Township	44.549
3	Laydaukkan	Dagon(east)Township	37.704
Bago Region			73.114
4	Bago (Kali)	Bago Township	35.608
5	Thanappin	Thanappin Township	15.161
6	Oakpho	Oakpho Township	22.345
Mandalay Region			186.448
7	Pathein Gyi	Pathein Gyi Township	79.267
8	Myit Thar	Myit Thar Township	58.215
9	Natyekan	A-ma-ya-pu-ya Township	36.549
10	Matayar	Ma-ta-yar Township	12.417
Nay Pyi Taw Council			19.719
11	Pyinmanar	Pyin-ma-nar Township	19.719
Ayeyarwady Region			79.279
12	Pathein	Pathein Township	19.095
13	Talotehla	Ma-u-bin Township	13.046
14	Hinthada	Hin-tha-da Township	13.400
15	Pantanaw	Pan-ta-naw Township	19.374
16	Aung hate	Ma-u-bin Township	14.364
Magway Region			9.404
17	Taungdwingyi	Magway Township	3.671
18	Pwint Phyu	Pwint Phyu Township	5.733
Kachin State			11.447
19	Waing-maw	Waing-maw Township	5.741
20	Bamaw	Bamaw Township	5.706
Sagaing Region			21.694
21	Shwe Bo	Shwe Bo Township	6.589
22	Yay Oo	Yay Oo Township	9.53
23	Htee chaint	Htee chaint Township	5.575
Mon State			3.142
24	Thahtone	Thahtone Township	3.142
Shan State			3.125
25	Nyaung Shwe	Nyaung Shwe Township	3.125
Kayin State			2.452
26	Pha aan	Pha aan Township	2.452

**Table.20. FISH HATCHERIES UNDER DOF
(2014-2015)**

			Unit - Million
No.	Fish Hatcheries	Location	Production
	Yangon Region		152.836
1	Hlaw Kar	Mingalardone Township	73.744
2	Twante	Twante Township	40.652
3	Laydaukkan	Dagon(east) Township	38.440
	Bago Region		68.640
4	Bago (Kali)	Bago Township	35.226
5	Thanappin	Thanappin Township	17.772
6	Oakpho	Oakpho Township	15.642
	Mandalay Region		157.184
7	Pathein Gyi	Pathein Gyi Township	73.936
8	Myit Thar	Myit Thar Township	59.268
9	Natyekan	A-ma-ya-pu-ya Township	11.494
10	Matayar	Ma-ta-yar Township	12.486
	Nay Pyi Taw		56.156
11	Pyinmanar	Pyin-ma-nar Township	56.156
	Ayeyarwady Region		86.250
12	Pathein	Pathein Township	19.813
13	Talotehla	Ma-u-bin Township	14.936
14	Hinthada	Hin-tha-da Township	14.439
15	Pantanaw	Pan-ta-naw Township	22.523
16	Aung hate	Ma-u-bin Township	14.539
	Magway Region		8.489
17	Taungdwingyi	Taungdwingyi Township	4.053
18	Pwint Phyu	Pwint Phyu Township	4.436
	Kachin State		9.893
19	Waing-maw	Waing-maw Township	3.892
20	Bamaw	Bamaw Township	6.001
	Sagaing Region		25.072
21	Shwe Bo	Shwe Bo Township	7.481
22	Yay Oo	Yay Oo Township	11.334
23	Htee chaint	Htee chaint Township	6.257
	Mon State		3.218
24	Thahtone	Thahtone Township	3.218
	Shan State		4.458
25	Nyaung Shwe	Nyaung Shwe Township	4.458
	Kayin State		3.216
26	Pha aan	Pha aan Township	3.216

**Table.21. FISH HATCHERIES UNDER DOF
(2015-2016)**

			Unit - Million
No.	Fish Hatcheries	Location	Production
	Yangon Region		165.363
1	Hlaw Kar	Mingalardone Township	80.407
2	Twante	Twante Township	42.011
3	Laydaukkan	Dagon(east) Township	42.945
	Bago Region		69.995
4	Bago (Kali)	Bago Township	35.570
5	Thanappin	Thanappin Township	18.214
6	Oakpho	Oakpho Township	16.211
	Mandalay Region		174.461
7	Pathein Gyi	Pathein Gyi Township	77.043
8	Myit Thar	Myit Thar Township	71.063
9	Natyekan	A-ma-ya-pu-ya Township	0.010
10	Matayar	Ma-ta-yar Township	26.345
	Nay Pyi Taw		56.149
11	Pyinmanar	Pyin-ma-nar Township	56.149
	Ayeyarwady Region		83.440
12	Pathein	Pathein Township	19.367
13	Talotehla	Ma-u-bin Township	17.366
14	Hinthada	Hin-tha-da Township	12.460
15	Pantanaw	Pan-ta-naw Township	20.695
16	Aung hate	Ma-u-bin Township	13.552
	Magway Region		9.546
17	Taungdwingyi	Taungdwingyi Township	4.296
18	Pwint Phyu	Pwint Phyu Township	5.250
	Kachin State		10.914
19	Waing-maw	Waing-maw Township	4.479
20	Bamaw	Bamaw Township	6.435
	Sagaing Region		26.263
21	Shwe Bo	Shwe Bo Township	7.904
22	Yay Oo	Yay Oo Township	11.389
23	Htee chaint	Htee chaint Township	6.970
	Mon State		3.403
24	Thahtone	Thahtone Township	3.403
	Shan State		5.835
25	Nyaung Shwe	Nyaung Shwe Township	5.835
	Kayin State		3.329
26	Pha aan	Pha aan Township	3.329

**Table.22. SHRIMP/PRAWN HATCHERIES UNDER DOF
(2011-2012 to 2015-2016)**

Unit - Million

No.	Shrimp/Prawn Hatcheries	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
	Shrimp(<i>Penaeus monodon</i>)					
1.	Wa-maw (Long-lone)	1.20	1.50	0.50	1.70	-
2.	Kyauk-phyu	0.80	1.00	1.50	2.50	2.00
3.	Ye-chan-pyin	0.60	3.00	1.50	-	2.27
4.	A-lae-tan-kyaw	0.20	-	-	-	-
5.	Chaung Tha (Sein Ngwe Mya) Prawn(<i>Macrobrachium rosenbergii</i>)	-	2.00	-	-	1.20
6.	Kyauk-tan	0.60	-	-	0.30	0.60
	Total	3.40	7.50	3.50	4.50	6.07

MAP OF THE SITUATION COLD STORES & ROCESSING PLANTS IN REGIONS AND STATES OF MYANMAR

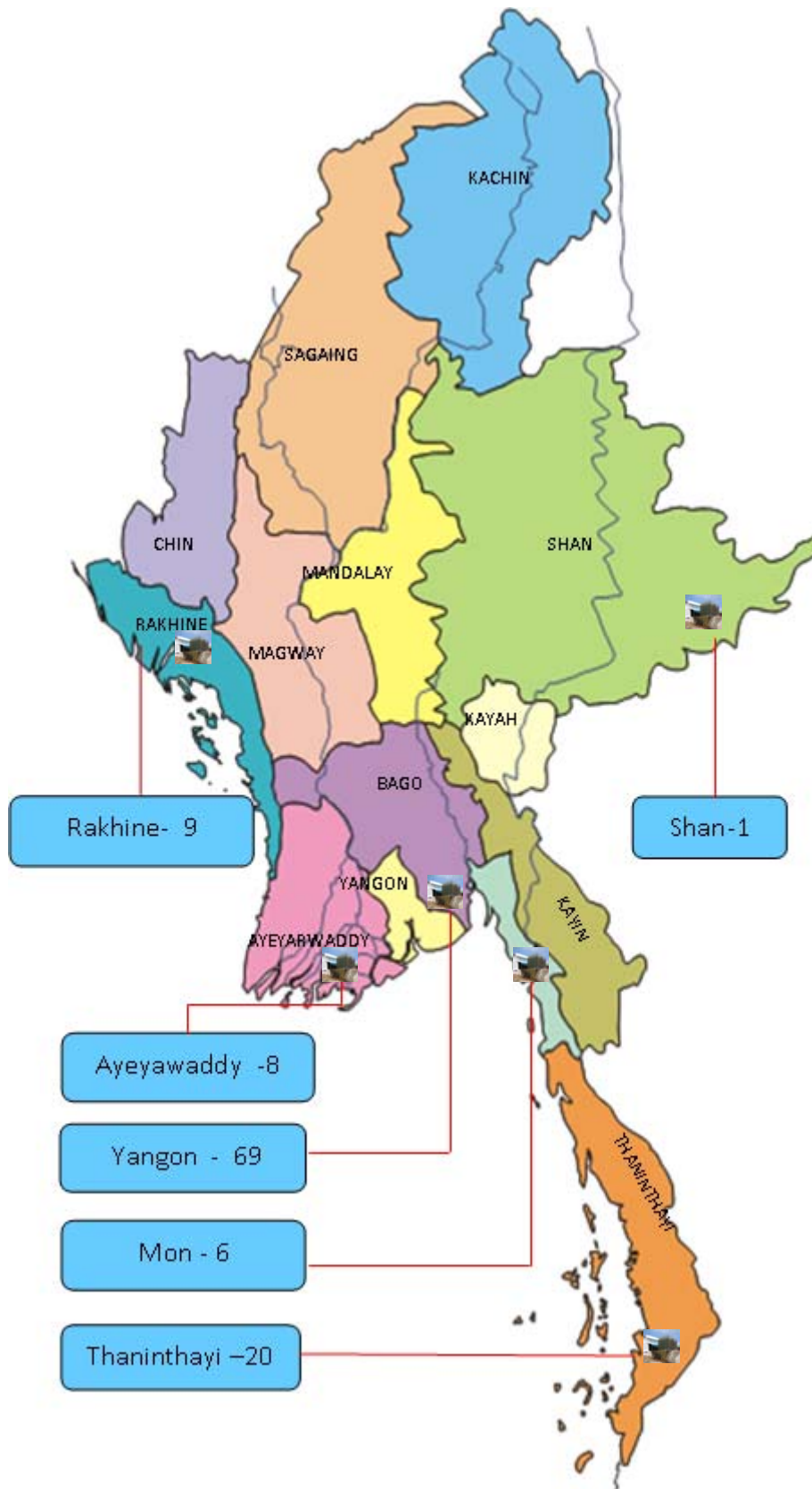


Table.23. ICE PLANTS

(BY REGION AND STATE)

NO.	REGION AND STATE	NUMBER OF PLANTS	CAPACITY OF ICE PLANT (METRIC TON PER DAY)
1	YANGON	106	2364.06
2	TANINTHAYI	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