The Republic of The Union of Myanmar

Ministry of Agriculture, Livestock and Irrigation

Department of Fisheries






Fishery Statistics 2018



THE REPUBLIC OF THE UNION OF MYANMAR

MINISTRY OF AGRICULTURE , LIVESTOCK AND IRRIGATION

FISHERY STATISTICS

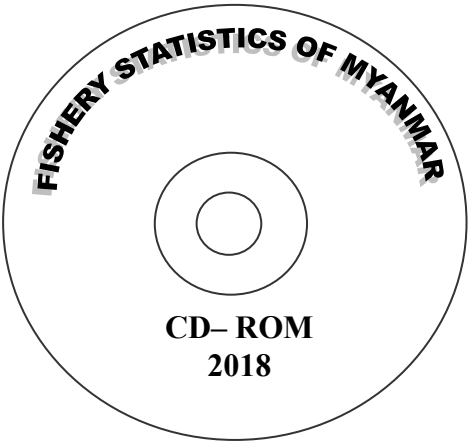
2018

Department of Fisheries

Myanmar

AVAILABLE NOW

MYANMAR FISHERY STATISTICS 2018



The CDs are currently available in English only. Hence, for further information please contact the Department of Fisheries, The Republic of the Union of Myanmar, as address given below.

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CONTENTS

Fishery Statistics

List of Tables

List of Figures

FOREWORD

Fishery Statistics of Myanmar for 2017-2018 fiscal year is published by the Department of Fisheries of the Ministry of Agriculture, Livestock and Irrigation. Since the fiscal year 2002-2003, it has been published the Fishery Statistics of Myanmar for the purpose of ideas to present data and information concerning fisheries and for more understanding of Myanmar Fisheries and the activities of Myanma 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, 2017-2018, 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. 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 gratitude to the Dr. Aung Thu, Union Minister for the Ministry of Agriculture , Livestock and Irrigation for his valuable and kind guidance. We also thank to U Hla Kyaw , Deputy Minister and Dr. Khin Zaw, Permanent Secretary for the Ministry of Agriculture , Livestock and Irrigation.

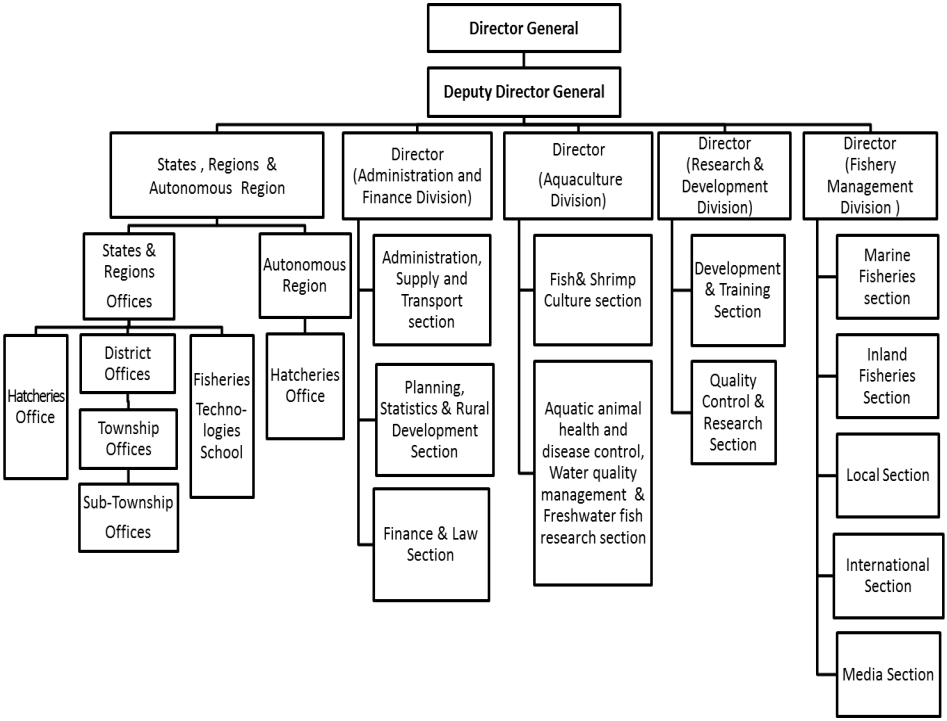
Moreover, Special thanks to U Myint Zin Htoo, Deputy Director-General and all of the Directors of the Department of Fisheries as well as all my staff for their contribution and hard working as completed the success of this publication.

Khin Maung Maw
Director-General
Department of Fisheries

September 14, 2018

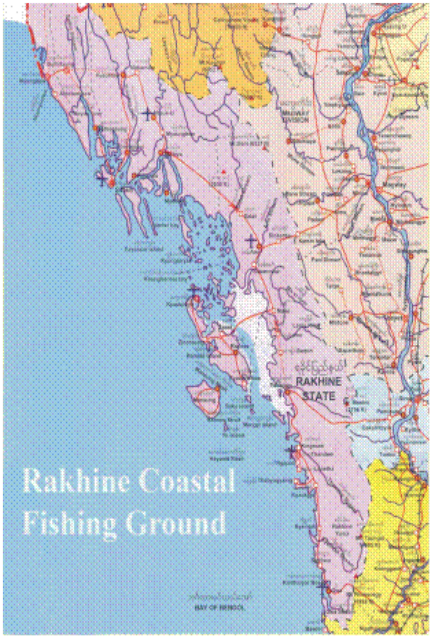
ORGANIZATIONAL STRUCTURE OF DEPARTMENT OF FISHERIES, MYANMAR

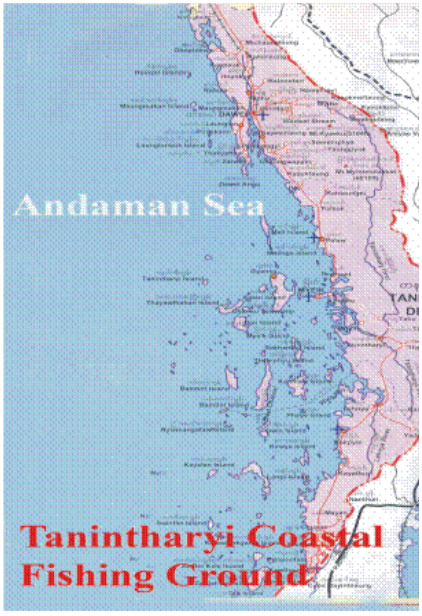
Officer	Other	Total
365	2104	2469



THE REPUBLIC OF THE UNION OF MYANMAR

MAPS OF FISHING GROUNDS





SHARE OF GROSS DOMESTIC PRODUCT

Sectors	2017-2018 GDP(%)
Agriculture	17.7
Trade	18.5
Processing & Manufacturing	23.6
Livestock & Fishery	8.0
Transportation	13.0
Construction	5.6
Rentals and Others Service	2.8
Social and Administrative Service	2.6
Communications	5.1
Mining	1.0
Forestry	0.1
Energy	0.1
Financial Institutions	0.6
Electric Power	1.3

Source: Planning Department

FISHERY BRIEF IN MYANMAR

Vision, Objectives, Policy and Plans

The Vision, Objectives, Policies and Plans are as follows;

Vision

Sustainable development of fisheries sector for security, improvement of the socio-economic of rural people and contribution to the economic development of the nation based on fisheries industry.

Objectives

a. Promulgation of fisheries laws and implementation of action plans in line with the sustainable development goals.
b. Availability of qualified information and collection of statistical data related to fisheries sector in line with the standard indicators.
c. Systematic implementation of fisheries co-management and ecosystem approach to improve the fisheries management.
d. Development of aquaculture industry by implementation of advanced techniques including Good Aquaculture Practices.
e. The implementation of research and development, extension and awareness services, and human resources development oriented towards sustainable use of fisheries resources.
f. The compliance with quality standards of fishery products aligned with the market requirements.

Policy

Ensuring food security, food safety and sustainable development of fisheries sector by conservation of fisheries resources in accordance with the fisheries laws.

Plans

a. For fisheries development, collaboration with local, international organizations and development partners to implement plans and projects formulated in accordance with the policies.

b. The compliance of the fisheries laws and rules and regulations amended, updated and aligned with international standards, best practice and provisions.
c. Processing of fisheries statistical data to meet the requirements of the standard indicators of related Ministries.
d. Obtaining technical assistance from local and international organizations for the development of a system for data collection, analysis and information dissemination system for fisheries management.
e. The establishment of accurate operational frame work for systematic improvement and implementation of fisheries co-management and ecosystem approach to fisheries management.
f. Implementation of the fisheries co-management and ecosystem approach to fisheries management, by promoting community fisheries organizations and their fisheries co-management committees, capacity building, gender promotion (women empowerment) and provision of technical assistance to fisheries sector.
g. Implementation of National Plan of Action Combating Illegal, Unreported and Unregulated (IUU) Fishing.
h. Promoting collaboration with related Ministries, Local, Regional and International Organizations for the implementation of the International, and Regional provisions, ASEAN declarations and commitments.
i. Promotion of conservation areas for marine and freshwater resources in critically important habitats.
j. Promotion of community fisheries organizations for improved fisheries resource management and rural development.
k. Allowing import of high quality fish/ shrimp seeds and brood-stock and producing genetically improved fish species.
l. Conservation of indigenous fish species and conducting research in breeding and culture of those species.
m. Cooperation with public, private and local/ international organizations for the promotion of sustainable fresh water and marine aquaculture industries.
n. Adoption of climate-smart fish species and their related breeding and culture techniques.

o. Cooperation with regional and international organizations for preventing and controlling of fish and shrimp diseases.

p. Encouraging the production and extensive application of qualified compound feed in aquaculture sub-sector.

q. Strengthening human resources development, by enhancement of fisheries related technical and vocational training (T-Vet), pre-employment training (PET), and on job training (OJT).

r. Conducting routine research on marine and freshwater habitats for fish species identification and stock assessment.

s. Enhancing research activities in support of fisheries management and development.

t. Conducting research in conservation and protection of enlisted endangered aquatic species and their habitats.

u. Strengthening development and research by promoting cooperation with international and regional scientific and best practice organizations.

v. Facilitating export of fishery products in accordance with the regional and international market requirements, and in compliance with Sanitary and Phyto-Sanitary (SPS) agreements and standards of the World Trade Organization.

w. Monitoring and controlling the production and processing of fishery products in line with the food safety standards of importing countries, and as documented in the official control manual of Department of Fisheries.

x. Providing technical assistance to Small and Medium Enterprises for the improvement of quantity and quality of fishery products.

y. Ensuring maintenance and enhancement of the capacities of Laboratories recognized by international ISO: 17025 certification for control and inspection of quality fishery products.

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.

States of Fisheries

In 2017-2018 fiscal year, the total production of fish was 5.87 million metric tons in Myanmar. In this period, the production of freshwater fish was 2.72million metric tons (46% of the total fish production) and the production of marine fish was 3.15 million metric tons (54% of the total production of fish in Myanmar).

The exported amount of fish and fishery product was (0.57) million metric tons and the value of which was (711.72) million in US$ in 2017-2018. It was exported to (46) different countries. The exported amount was (10%) of the total production of fish in Myanmar in this period, 2017-2018.

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.

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;

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

Among four existing fishery laws, have empowered Freshwater Fishery Law to respective regions and states authorities and combined Law Relating to the Fishing Rights of Foreign Fishing Vessels and Myanmar Marine Fishery Law and amending to Union Fishery Law (Draft). Also, amending draft of Aquaculture Law for modernization.

Taking Action to the Illegal Harvest

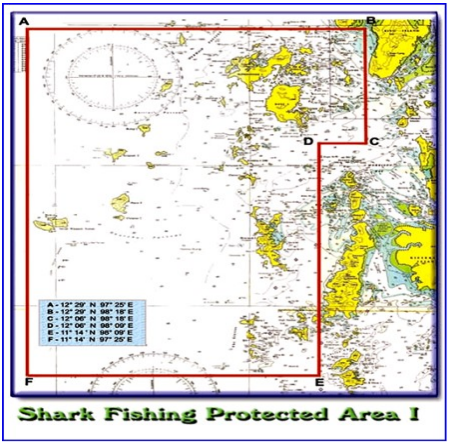
Department of Fisheries manages the conservation of the fishery resources. With regard to the conservation of the fisheries resources and to maintain for the long- term of the fisheries resources, DOF is managing to stop the illegal harvest for exporting such as alive mud crab (not allow to export which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

Food Security for Myanmar

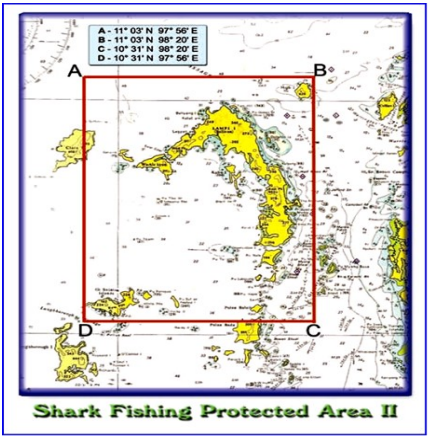
For food sufficiency of Myanmar people including living people in rural area, the plan of implementation for food security were carried out by Department of Fisheries of Myanmar with the releasing fish fingerlings into natural resources such as lakes, dams, reservoirs, and open waters and the genetic 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.



Shark Fishing Protected Area I



Shark Fishing Protected Area II

FISHERIES MANAGEMENT DIVISION

Establishment of Fish Protected Areas in Marine Waters

Department of Fisheries has been conducting the fisheries management and conservation fisheries resources in accordance with the Myanmar Marine Fisheries Law. In the section 22 of the Myanmar Marine Fisheries Law, it is prescribed that the Director General shall determine the following:-

a. type of fishery, volume of business and duties and fees;
b. method of catching fish, period of fishing, species of fish permitted to catch, size of fish, fishing gears and fishing grounds;
c. licence conditions.

Also it is prescribed in section 23, the Director General may, for the purpose of carrying out the fishery systematically, and for the conservation and protection of the fish, issue conditions, prohibitions, orders, and directives relating to fishery.

To conduct the conservation and management of fisheries waters, Department of Fisheries set up the objectives as the following:-

a. Promulgation of fisheries laws and implementation of action plans in line with the sustainable development goals.

b. The implementation of research and development, extension and awareness services, and human resources development oriented towards sustainable use of fisheries resources.

The followings are the plans of Department of Fisheries to implement the objectives;

a. Promotion of conservation areas for marine and freshwater fisheries resources in critically important habitats.

b. Promotion of community fisheries organizations for improved fisheries resource management and rural development.

c. Conservation of indigenous fish species and conducting research in breeding and culture of those species.

Department of Fisheries initiated the identification of fish protected areas in marine water since 1993 . These areas located in five coastal state and regions namely Ayeyawady, Mon, Tanintharyi, Rakhine and Yangon. Some of

marine fish such as Crab, are spawning in the brackish water areas as though the some brackish water areas were identified as Crabs Protected Areas. DoF has identified seven Fish protected areas, twelve Crab Protected Areas, one Lobster Protected Area and one Indian Threadfin Protected Area.

To be effective the measures of fisheries management, fisheries co-management is flexible and cooperative management of aquatic resources by the user groups (Fishers and Fisheries Stakeholders) and government. Both the fishery community and government are involved during the decision making, implementation and enforcement processes. DoF has identified three LMMA-Locally Managed Marine Area in Tanintharyi Region for the implementation of fisheries co-management since 2017.In these areas, rules and regulations were prescribed by the consultation between local fishers and DoF.

There are many facts and procedures to establish the Fish Protected Area. It needs to be attached with the objectives and benefits of Fish Protected Area, the recommendation of village administrator, township office of Department of General Administration, the meeting minutes of DoF with the fishers, the field survey record of DoF and University, map of fish protected area, the recommendation of Regional/ State/ District/Township office of DoF, MFF and agreement of Regional or State Governments and the rules which identified to follow in those specific area.

The establishment of Fish Protected Area is based on the proposal of fishers according to their experience in fishing grounds. In some fish protected areas and fisheries co-management areas, it is regulated for the limitation on kinds and numbers of fishing gears as well as fishing season. Some kinds of fishing gears such as Drift net and Set net are restricted by mesh size and length. Some fishing gears are prohibited.

The weakness of establishment of Fish Protected Area is the insufficient Monitoring, Control and Surveillance –MCS System by DoF and local fishers. The Staffs of DoF are not supported sufficient facilities for implementation of MCS and MCS activities is not completely covered the whole fish protected areas to prevent, deter and combat IUU fishing. Staffs of DoF also are not able to conduct the monitoring and evaluation for the establishment of these areas.

Department of Fisheries has been trying to extend the fish protected area, fisheries co-management area and locally managed marine area within marine waters. However, DoF have to focus not only on the wide nation spread of Fish Protected Areas but also the coverage of MCS system. DoF has been trying to reach the target of National Biodiversity Strategic Action Plan (NBSAP).

Aquaculture Division

The structure of Aquaculture Division comprises with Fish and Shrimp Culture Section, Aquatic Animal Health and Disease Control Section, Freshwater Fish Research Section and Crocodile Farm. 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 30282 acres in 1990-1991 to 174293 acres in 2000-2001 and then to 443695 acres in 2010-2011 and 491345 acres in 2017-2018. Aquaculture production has also increased steady annually from 6397 MT in 1990-1991 to 128225 MT in 2000-2001 and 1048690 MT in 2016-2017. The production from aquaculture subsector increased to 1130350 MT in 2017-2018, which was an increase about 7.78 % compared to 2016-2017 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 brood stocks 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 luneatus (Taung paw nga tha lott)*, *Leptobarbus hoevenii* (Sultan fish), *Anabas testudineus* (Climbing Perch) were successfully induced breeding by experimental scale.

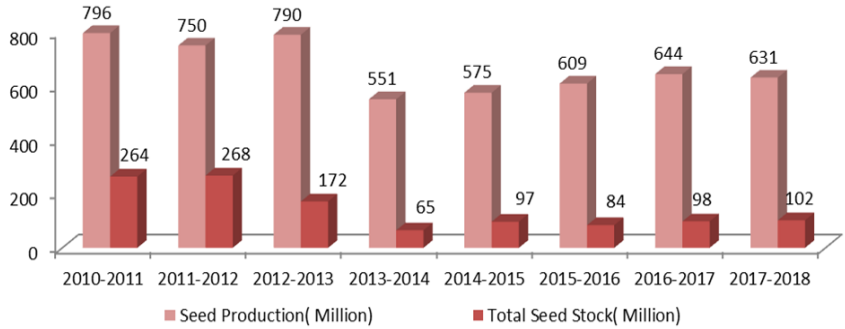
Workforce

In the field of aquaculture, a total of 48672 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 57957 number of permanent men labours working in 2017-2018 fiscal year.

Fish Fry and Fingerling Production

In 2017-2018, 27 hatcheries owned by the Department of Fisheries had managed to produce a total of 631.16 million freshwater fish fry and fingerling whereas 37 private hatcheries around Myanmar had produced an impressive amount of 2462.83 million fry and fingerling.

Accordingly the Department of Fisheries 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 2017-2018 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 15208 acres of paddy field in States and Divisions were stocked with fish seed in 2017-2018.

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 8863.61 acres 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 farmers 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 2017-2018 Myanmar have three types of shrimp farming: Semi-intensive shrimp ponds 24536.29 hectares, Extensive plus shrimp ponds 61059.63 hectares and Extensive or traditional shrimp ponds 169818.54 hectares totaling 235474.46 hectares. The total production of fresh water prawn and marine shrimp in 2017-2018 were 35694.20 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 brood stocks 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 neighboring countries such as Thailand and Bangladesh. Import numbers of shrimp larva from Bangladesh was not yet available. In 2017-2018, tiger

shrimp, freshwater prawn and white shrimp larva was imported in the amount of 57.99 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 culturing 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 2017-2018, the total numbers of 61.58 million *P. vannamei* larva were imported. Recently, the most prominent development of White Shrimp culture is in Tanintharyi Region at Pyay Pho Tun Co. Ltd. Pyay Phyo Tun Co., Ltd initiated the white shrimp farming in 2016 and increasingly invested for more production of white shrimp farming for more production. In 2017, the company produced 1334.936 Metric ton of white shrimp and 1006.194 MT in 2018.

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 sea-bass 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* Seaweed 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 2017-2018 was 30.722 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 1.2 million pieces and US$ 0.17 in 2017-2018.

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 planning 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 near by 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 375 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 people. In addition, Department of Fisheries constructed 122 numbers of fish backyard hatcheries at 15 different Regions and States in 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 Extension Team 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.

The Department of Fisheries has issued GAqP certificates on 3376.82 hectares for 5 farmers during last year. For the trade promotion of the aquaculture products, EU gave the awareness training of GAqP,(18) times for capacity building of DoF staff and stakeholders.

Aquaculture support services

In 2017-2018, 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 formed (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 2017-2018, Freshwater fish research section gave services of water quality analysis on 447 cases and soil analyses on 4 cases including Tuntay Lab and Mandalay Regional Lab. Aquatic animal health and disease control section provided support services of on-site field analyses on 25 cases, lab disease analysis on 207 cases and PCR check for disease on 162 cases.

Freshwater Aquaculture Research and Extension Centre

Collaboration between Department of Fisheries, Ministry of Agriculture, Livestock and Irrigation and KOICA had established Freshwater Aquaculture Research and Extension Centre from 2014 to 2018 under the project of “Development of Inland Fish Farming Technology in Myanmar” and the Centre was opened on 19-1-2018. Moreover, it had conducted “Training for Advanced

Inland Fish Farming Technology" from 8-1-2018 to 2-2-2018 to conduct training for farmers, to research with Universities by utilization this Centre. The project is extended to 2018 December. By implementing this Freshwater Aquaculture Research and Extension Center, from experience of Korea and Myanmar, human resources and technical support, it will improve modern technology in freshwater aquaculture sector and this Centre is the first research Centre in Myanmar.

RESEARCH AND DEVELOPMENT DIVISION

Quality Control and Research Section

Department of Fisheries has been implementing to promote exported fishery products according to Vision, Policy and Work Plans of Department of Fisheries. Under the Research and Development Division, Department of Fisheries has already organized Quality Control and Research Section including Inspection and Certification Unit and Analytical Unit.

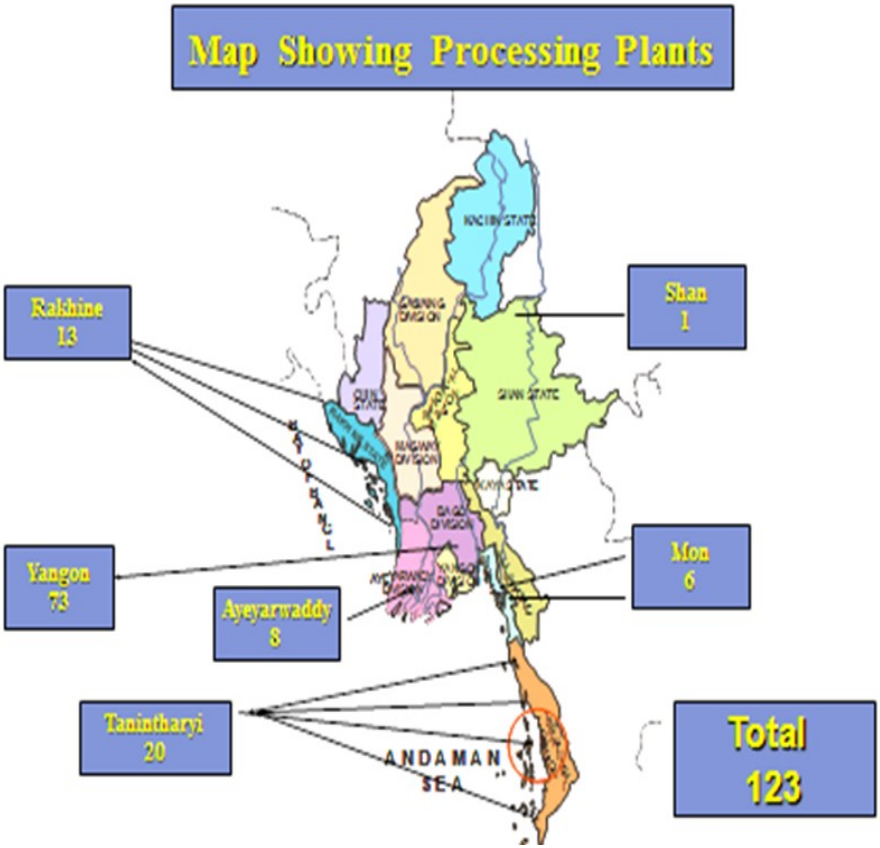
Inspection and Certification Unit

Department of Fisheries responsible Government Organization for seafood safety activities to ensure the quality and safety of fish and fisheries products. According to the responsibility for the quality of exported fishery products to comply with international standard requirements including importing countries' requirement, Inspection and Certification Unit has been implementing the Monitoring, Control and Surveillance (MCS) activities to be ensure the quality and safety of fish and fishery products. At the present Inspection and Certification Unit has been formed with (5) officers and (24) staffs to implement with exerting in seafood safety activities for fishery establishments.

Food safety management system such as GMP/HACCP are implemented enforcing by Inspection and Certification Unit,under the Research and Development Division, Department of Fisheries in fishery establishments to operate in exported fishery products according to ASEAN Regional Guideline, Importing Country's Requirement, Code of Practices in the Regulation. The facilitating of the export fishery products in accordance with the regional and international market requirements, and in compliance with Sanitary and Phyto-sanitary (SPS) agreement and standards of the World Trade Organization.

Inspection and Certification Unit 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 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 unit, DOF issued the factory license for (123) processing establishments in 2017-2018 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 Unit 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, (33) establishments have been approved exported to Vietnam, (6) fish meal establishments and (105) establishments including dried product warehouses and chilled product sites have been registered exported to China.



Myanmar has been exporting only frozen wild caught fishery products from (20) approved establishments, Inspection and Certification Unit has been performing to export aquaculture products to EU member countries assistant by EU. National residue plan are prepared and guided by international expert from EU Commission. National residue monitoring plan (2017-2018) and progress report for (2016-2017) have submitted to DG SANTE. Both Good Aquaculture Practices and Good Aquaculture Practices- Compliance and Traceability Training Course have been conducted in these NRMP implemented aquaculture farms by the assistance of EU also.

Currently, Department of Fisheries has issued the " Technical Regulation for Export Import Fishery Products" based on WTO-SPS agreement assistance by FAO due to Directive-2/2015 for fishery establishments to operate in food safety activities through the supply chain like that fishing, aquaculture, fishing vessels ,landing sites, auction markets ,feed plants, ice making plants for fishery products and processing establishments according to the international market requirements especially ASEAN, China and importing countries requirement.

Department of Fisheries has conducted some important training program like that HACCP Principles and its Implementation, Good Hygiene Practices in Fish Handling and Traceability, Internal Audit, Risk Analysis for Fishery Products to inspectors of Inspection Certification Unit and employees from processing establishments, landing sites and ice plants by the assistance of FAO project.

Currently, EU-GIZ has been supporting the technical assistant, equal 10.5 million euro within 2015 to 2018 under the Trade Development Program through the supply chain such as fishing vessels, landing sites, ice plants due to comply with food safety management system due . EU-GIZ has also supported for Inspection and Certification Unit to building capacity on food safety management systems such as Good Manufacturing Practices (GMP), Good Hygiene Practices (GHP) and Hazard Analysis Critical Control Point System (HACCP).

Under the Trade Development Program, EU has been supporting the technical assistances for Department of Fisheries as follows:

- Inspectors of Department of Fisheries have been trained to implement the food safety management systems effectively in supply chain

activities like that fishing vessels, landing sites, aquaculture farms, ice plants, feed plants and fishery establishments.

- Information management system (data based management) has been operating for the plan and performances of National Residue Monitoring Plan , factory inspection report and further more fishing vessels and landing sites inspection reports.
- Department of Fisheries, Inspection and Certification Unit has been implementing the Trade Control and Expert System (TRACEs)in order to establishment a new electronic health certificate system for fishery products exported from Myanmar.
- On the strengthening and modernization of the Department of Fisheries' s inspection systems and support procedures and activities in accordance with the requirements of the international standard for inspection bodies ,ISO 17020.
- Workshop on Writing Inspection Report, Non-compliance, Corrective Action Request and Procedures for Pre-export Verification.
- Conducted the Workshop on Cold Store Management and Workshop on Water Treatment System for EU approval factories.

An ASEAN 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 Unit has conducted the training for ASEAN Rapid Alert System for Food and Feed by the supporting of Experts from Thailand. Inspection and Certification Unit has conducted to attending the National Contact Point Meeting and Steering Committee Meeting on ASEAN Rapid Alert System.

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

Otherwise, according to ASEAN Economic Blue Print, Inspection and Certification Unit has been implementing food safety issues related priority

integrated sectors to harmonies in trading between ASEAN countries, Inspection and Certification Unit has been implementing the minimum requirement for seafood trade in ASEAN particularly the farming system requirement for seafood trade in ASEAN particularly the farming system requirements, product standards, laboratory accreditation and health certification requirements.

Activities of Analytical Laboratory Unit

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 accredition 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 coming 17-18 September 2018 at reassessment (Microbiological Test (TPC, Coliform, *E.coli, Salmonella, Staph.aureus, Vibrio cholerae and Listeria monocytogenes*) and Chemical Test(Nitrofuran, Chloramphenicol, Tetracycline) and Heavy Metal(Cadmium, Lead and Mercury) . Now, Laboratory prepare to reassessment for 2018-2020 and the certification valid has been September 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 dated on (2-10-2017 to 20-10-2017) , Heavy Metal Testing dated on (23-5-2017 to 27-6-2017) were participated PT from QMAS-LGC(UK). Chemical Testing included Nitrofuran Testing dated on (16-10-2017 to 1-12-2017) with FAPAS(UK) and Chloramphenicol Testing dated on (14-12-2017 to 26-2-2018) and Tetracycline testing dated on (16-2-2018) with FAPAS (UK) in detection of Shrimp.

Calibration Certificate for Measuring Equipment and Devices

For 2017-2018 program of calibration by ISO17025:2005 accredited laboratory's maintenance was finished and calibrated at 23 September 2017 with Central Laboratory (CLT) from Thailand. All measuring equipment and instruments are 66 items.

Preventive Maintenance

The laboratory had contracted every year for Regular Preventive Maintenance (RPM) between DoF and Sciex(Thailand) Co., Ltd from Thailand and AMTT Co., Ltd from Myanmar for LC/MS/MS of 2017-2018 program for three times .

Preventive Maintenance of Non calibrated Equipment /Instrument items (39) for Microbiological Lab's equipment and remaining chemical equipment as HPLC and GC/MS/MS also finished preventive maintenance by AMTT Co., Ltd. from Myanmar dated on June 2018.

Training Programme of Laboratory

- EU-GIZ ,Chemical Training(ICPOES) by Expert Mr. Anders (9-10-2017 to 13-10-2017)
- EU-GIZ, Chemical Training (ICPOES) by Expert Mr. Anders (23-10-2017 to 27-10-2017)
- EU-GIZ,Chemical Training (GC/MS/MS) by Expert Dr Margarita(17-1-2018 to 19-1-2018)
- EU-GIZ,Chemical Training (ELISA) by Expert Dr Margarita (18-8-2017 to 24-8-2017)
- EU-GIZ,Chemical Training (GC/MS/MS) by Expert Mr. Benoit (15-5-2018 to 17-5-2018)
- EU-GIZ, Micro Training and Internal Audit Training by Expert Ms.Annette Lillie(5-7-2017 to 6-7-2017)
- EU-GIZ,Micro Training by Expert Ms.Annette Lillie(13-3-2018 to 14-3-2018)

Action Plan for Future

National Residue Monitoring Program(NRMP)

- Analytical laboratory have still implement to National Residues Monitoring Program and already done for Progress report(2017-2018) and Annual plan(2018-2019) submit to EU, DG-SANTE.
- In addition , Analytical Laboratory send to Central Laboratory (Thailand, Songkhla Branch) for other chemical testing .
- Analytical Laboratory send to TUV Laboratory, Italy for PCBs and Dioxin testing.

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 sea turtles on Thameehla Island (Diamond Island) in Ngaputaw Township, Ayeyarwady Division. Then in 1986, the project was fully revived and hatchery was established.

Generally sea turtle conservation activities are conducted in collaboration and with the assistance of Southeast Asian Fisheries Development Center (SEAFDEC). Since 2001 the turtle conservation activities have been enhanced as the collaboration with International agencies and organizations are extended. The Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the 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).

The sea turtle species recorded in Myanmar are loggerheads(*Carettacaretta*), green turtles (*Cheloniamydas*),hawksbills (*Eretmochelysimbricata*), olive ridleys (*Lepidochelysolivacea*),and leatherbacks (*Dermochelyscoriacea*). Department of Fisheries 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 carrying out. Currently, Department of Fisheries is carrying out tagging and using temperature data loggers in the turtle nests to understand sex differentiation of the turtles.

The public needs to be widely educated and informed for the conservation and protection of sea turtles The DOF educated the fishermen and public living in the coastal areas on the conservation and protection of marine turtles. 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.

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.

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 2014, Thameehla Island, Department of Fisheries received the Network of Sites of Importance for Marine Turtles in Indian Ocean -South East Asia Region Certificate which were certified by United Nations Environment Programme (UNEP), Convention on Conservation of Migratory Species (MS) and IOSEA.

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.

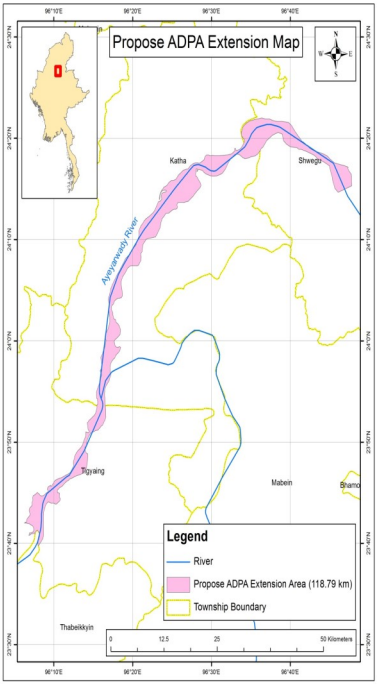
Wildlife Conservation Society (WCS) staff in collaboration with the Department of Fisheries staffs conducted the Ayeyarwady dolphin monitoring, surveillance and visual boat-base survey, and the team always identified and estimated the population and group size and threats to the dolphins between

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.

In 2018, The Irrawaddy dolphin conservation to further improvement of the Irrawaddy dolphin species, the longest river of the pastures spread over the Irrawaddy dolphin, the maximum number of ayeyarwady dolphin. The Department of Fisheries (DoF), Ayeyarwady dolphin Protected Area stretches (118.79 km) is being tried to extend upstream of Ayeyarwady river segment between Htee-gyint Township, Katha District, Sagaing Region, and Shwe Gu Township, Bhamo District, Kachin State where is the most population of Ayeyarwady dolphin.

Ayeyawady Dolphin Protected Area



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Cooperation fishing of Ayeyarwady Dolphin and Cast net fisherman

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

The Letter of Agreement - LoA was signed on the 23rd September, 2016, between the Department of Fisheries and Wild Life Conservation Society (WCS) USA, for the purpose of marine conservation program, WCS will extent her conservation activities in collaboration with DOF.

Marine Ecosystem Survey with focus on Egg and Larvae and Micro-plastic in water and fish conducted by Research Vessel Dr. Fridtjof Nansen

Background of the Dr. Fridtjof Nansen surveys in Myanmar

The first assessment of the state of the fishery resources of Myanmar was conducted through two surveys during 1979-1980, using the Research Vessel-RV Dr. Fridtjof Nansen. 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 Exclusive Economic Zone-EEZ.

The Maximum Sustainable Yield- 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.

Dr. Fridtjof Nansen surveys in Myanmar

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 2013 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 The 2013 and 2015 surveys also conducted some benthic habitat mapping in a limited area along transects between 11 and 13 S. Objectives included:
- Benthic habitat mapping
- Sampling of benthic communities, in- fauna and macro-fauna
- Determination of sediment composition and chemical analysis (heavy metals and hydrocarbons)

Main findings of the 2013- 2015 surveys

(Note: These estimates do not include waters shallower than 20 m)

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. The results of the size composition showed 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 overfishing.

The regional survey by Dr. Fridtjof Nansen Survey in 2018

The regional survey of the area of Bay of Bengal by new constructed the vessel was started in Colombo (Sri Lanka) on 23 June 2018 and covered the continental shelf and upper slope of Sri Lanka. After completion of the survey off Sri Lanka the vessel moved northwards to complete oceanographic sampling in the international waters of the Bay of Bengal. In Bangladesh and Myanmar, the main emphasis will be on pelagic resources, including distribution of mature fish, eggs and larvae. Off Thailand the deep waters of the Andaman Sea was covered.

In 2018, in order to supporting the application of the Ecosystem Approach to Fisheries Management consideration climate and pollution impacts in Myanmar, the survey was conducted from 24 August to 29 September 2018 with special references to the distribution of fish's egg and larvae, sampling were carried out the oceanographic conditions, including oceans pH, primary productivity, tissue sampling for genetics, contaminants, mammal recording. Additionally, conducted the containment of micro-plastic inside the fishmeal, natural water body and sediment in terms of food safety and pollution impacts.

Research Vessels of Dr. *Fridtjof Nansen*

Collaborate with Fauna and Flora International-FFI Fresh and Marine Biodiversity Conservation Activities

Fauna & Flora International (FFI) signed Letter of Agreement (LoA) with the Department of Fisheries in December 2014 and implementing biodiversity conservation projects in Kachin State, Ayeyarwaddy Region and Tanintharyi Region base on the vision of the sustainable future for the planet, where biodiversity is effectively conserved by the people who live closest to it, supported by the global community. Through implementing biodiversity conservation projects, FFI is finding out opportunities for alternative livelihood development through village consultation processes together with the Department of Fisheries to reduce poverty of local communities.

FFI is also undertaking fish biodiversity surveys in the projects in collaboration with the Department of Fisheries. Because of these surveys, 25 new fish species for the science have been identified. In Indawgyi basin, 95 fish species were recorded and 6 species such as *Lepidocephalichthys* sp. Indawgyi, *Acanthocobitis* sp. Indawgyi, *Physoschistura* sp. Indawgyi, *Schistura* sp. aff. *malaisei*, *Schistura* sp. Indawgyi, *Amblyceps* sp. Indawgyi were recorded as new species for the science. Along the watershed tributaries of Malihka River in Putao District, 46 fish species were recorded and 5 species such as *Devario* sp., *Aborichthys* aff. *kempi*, *Acanthocobitis* aff. *botia*, which has 3 loach species are *Schistura nubigena*. 1, *Schistura wanlainensis.,* 2 and 3. Malihkaia aligera were recorded as new species for the science. In the Taninthary River, 113 fish species were identified and 9 species such as *Hypsibarbus* sp., *Macrognathus* sp., *Dermogenys* sp., *Crossocheilus* aff. *burmanicus*, *Brachydanio* aff. *kerri*, *Pangio* aff. *pangia*, *Garra* sp., *Acantopsis* sp., *Balitoropsis* aff. *leonardi* were recorded as new species for science. In Lenyar River, 54 fish species were recorded and 5 species such as *Poropuntius* sp., *Dermogenys* aff. *collettei*, *Brachydanio* aff. *kerri*, *Pangio* aff. *Pangia*, *Garra* sp. Were recorded as new species for science.

Schistura wanlainensis.,

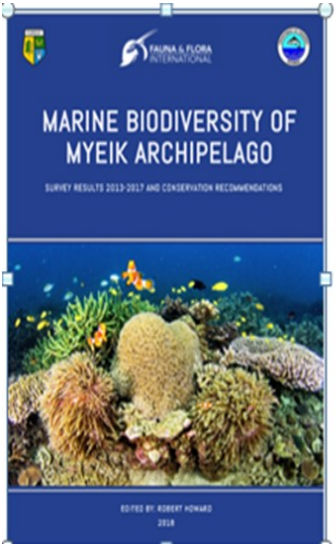
Schistura nubigena

Malihkaia aligera

Three new Species Loach of Malihka River in Putao District , Kachin State.

FFI is also implementing conservation projects in collaboration with the Department of Fisheries and supported by the Tanintharyi Regional Government to establish Locally Managed Marine Areas (LMMAs) in Done Pale Aw village and Lin Lon-Parawah village on the Thayawthadangyi Island and Langann village on Langann Island for the sustainability of the livelihood of the local communities in the Myeik Achipelago. Fish Conservation Zone establishing projects have been implemented in the Indawgyi Wildlife Sanctuary and along the tributaries in the Hponganrazi Wildlife Sanctuary for the sustainability of fish biodiversity supported by the Department of Fisheries and local government.

FFI can already two published books which are Marine Biodiversity of Myeik Archipelago: survey results and conservation recommendation 2013 to 2017 reports and Field Guide to Sharks of Myanmar, collective effort of a team of scientific researchers, international researchers, students, relevant government officers and NGO staff. First one has included detailed surveys of the coral reefs and its associated fish and invertebrate life, studies on the areas seagrass beds and fish species which support as well as developing detailed recommendation for the conservation of the archipelago.



Marine Biodiversity Results and Field Guide book of Sharks

Research and Training (Fisheries Training Supervision Section)

Department of Fisheries (DoF) is responsible for the development of fisheries 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 - IFT, Gyogone (Yangon Region)
- Upper Myanmar Fisheries Training Center, Sagaing (Sagaing Region) and
- Lower Myanmar Fisheries Training Center, Pyapon (Ayeyarwady Region)

Human resource development in fishery sector and capacity building are carried out through the fishery training centers. In the year 2017-2018, ten training courses have been successfully conducted associated the fields of Aquaculture, Smart Data Base Use Training on Ayeyarwady Dolphin Species and Protected Area, Training on Capacity Building, Training on Capacity Building for Project Survey Training on Aquaponic, Training on Applied Computer, Training on English Speaking, Training on Safety at Sea, Supporting Training of Quality Control and Research Section, On-site Training on Post-Harvest Fisheries Technology (Food Safety and Quality Control) and On-site Training on GMP, SSOP and HACCP for Fish Processing Plants : totally 1865 trainees have been acquired knowledge of fisheries relevant fields. The various training for fishery taskforce skill development in (2017-2018) fiscal year has been conducted with 42 trainings and 1865 trainees in total.

No	Training Course	2017-2018		Remarks
		No of Course	No of Training	
1.	Training on Aquaculture	24	1326	- DoF Training Center (Sagaing Region) - Hlawgar Fishery Station - Bago Fishery Station - Tee Tane Fishery Station - Kachin State - Yazin Fishery Station - Magwe University - Institute of Agriculture Science (PwintPhyu) - Kayar State - Shan State -Yinn Mar Pin Fishery Station, - University of Pa Khoke Ku - Hotel Mandalay, Mandalay Region - University of Shwe Bo, Dep: of Zool - Thanetpin Fishery Station - DoF Training Center (Pyapon) - Okk Pho Fishery Station - Inn Taw Towhship, Se Yaw Village - University of Lar Show - University of Kyine Don
2.	Smart Data Base Use, Ayeyarwaddy Dolphin Species and Protected Area	1	26	DoF Training Center (Sagaing)
3.	Training on Capacity Building	1	15	DoF Training Center (Sagaing)
4.	Training on Capacity Building for Project Survey	1	32	DoF Training Center (Pyapon)
5.	Training on Aquaponic,	1	53	Institute of Fisheries Technology –IFT (Gyogone)
6.	Training on Applied Computer	2	33	DoF Training Center (Sagaing)
7.	Training on English Speaking	1	15	DoF Training Center (Sagaing)

No	Training Course	2017-2018		Remarks
		No of Course	No of Training	
8.	Training on Safety at Sea	1	12	DoF Training Center (Pyapon)
9.	Supporting Training of Quality Control and Research Section,	2	45	- DoF Training Center (Sagaing) - Institute of Fisheries Technology -IFT (Gyogone)
10.	On-site Training on Post-Harvest Fisheries Technology (Food Safety and Quality Control)	1	26	DoF Training Center (Pyapon)
11.	On-site Training on GMP, SSOP and HACCP for Fish Processing Plants	7	282	On-site Fish Processing Plants
	Total	**42**	**1865**	

In Order to develop Fisheries Training Center and Fisheries Extension Officer, Development & Training Session is laid down the plan to conduct the following work plans during the fiscal year (2018-2019):

* TOT Program for Junior Fishery Officer
* Basic Aquaculture or Junior Staffs from Fishery Station
* Apply Computer Training
* English Speaking
* Training on Shrimp Aquaculture
* Training on Fishery Inspector
* On-site Training on Implementation of GMP, SSOP and HACCP for Fish Processing Plants
* Training on Taxonomy & Identification of Fish
* Supporting Training of Quality Control and Research Section
* Training on Safety at Sea
* Fisheries Management
* Training on Knowledge Sharing Fishery Resources Conservation
* Fishing Gear
* Post-Harvest Fisheries Technology (Food Safety & Quality Control)

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.	Group	2017-2018					
		Training		Workshop/ Meeting Semi-nar/Duty		Delegation/ Study Tour/ Trade Fair	
		Freq:	Person	Freq:	Person	Freq:	Person
1	SEAFDEC	2	4	18	42	-	-
2	USAID	-	-	1	1	-	-
3	OIE	-	-	1	1	-	-
4	MPEA	-	-	3	5	-	-
5	MYFish Project	-	-	2	3	-	-
6	WCS	-	-	1	2	-	-
7	TDP	-	-	1	1	-	-
8	NOAA	-	-	1	1	-	-
9	NACA	1	1	1	1	-	-
10	Gov of Myanmar	-	-	1	1	-	-
11	Gov of USA	-	-	3	5	-	-
12	Gov of Norway	-	-	1	6	-	-
13	MOFCOM	4	11	3	5	-	-
14	JICA	4	13	4	12	-	-
15	Gov of Korea	-	-	2	2	-	-
16	Gov of Japan	2	2	1	1	-	-
17	Gov of Thai	1	1	2	6	-	-
18	Gov of Singapore	1	1	-	-	-	-
19	ASEAN-Korea	-	-	1	1	-	-
20	NADFC	-	-	1	1	-	-

No	Group	2017-2018					
		Training		Workshop/ Meeting/ Semi-nar/Duty		Delegation/ Study Tour/ Trade Fair	
		Freq:	Person	Freq:	Person	Freq:	Person
21	MSU	-	-	1	1	-	-
22	Delta Flow Project	-	-	1	1	-	-
23	DMCR	-	-	1	1	-	-
24	KOICA	2	3	-	-	-	-
25	TUSMAT	1	1	-	-	-	-
26	FAO	-	-	5	11	-	-
27	TICA- JICA	1	40	-	-	-	-
28	IUCN	-	-	1	1	-	-
29	ACMC	-	-	1	1	-	-
30	DANIDA Project	-	-	3	11	-	-
31	ADB	-	-	1	1	-	-
32	OFCF	-	-	1	1	-	-
33	JIRCAS	-	-	1	1	-	-
34	UNODC	-	-	1	1	-	-
	Total	**19**	**77**	**65**	**128**	**-**	**-**

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.

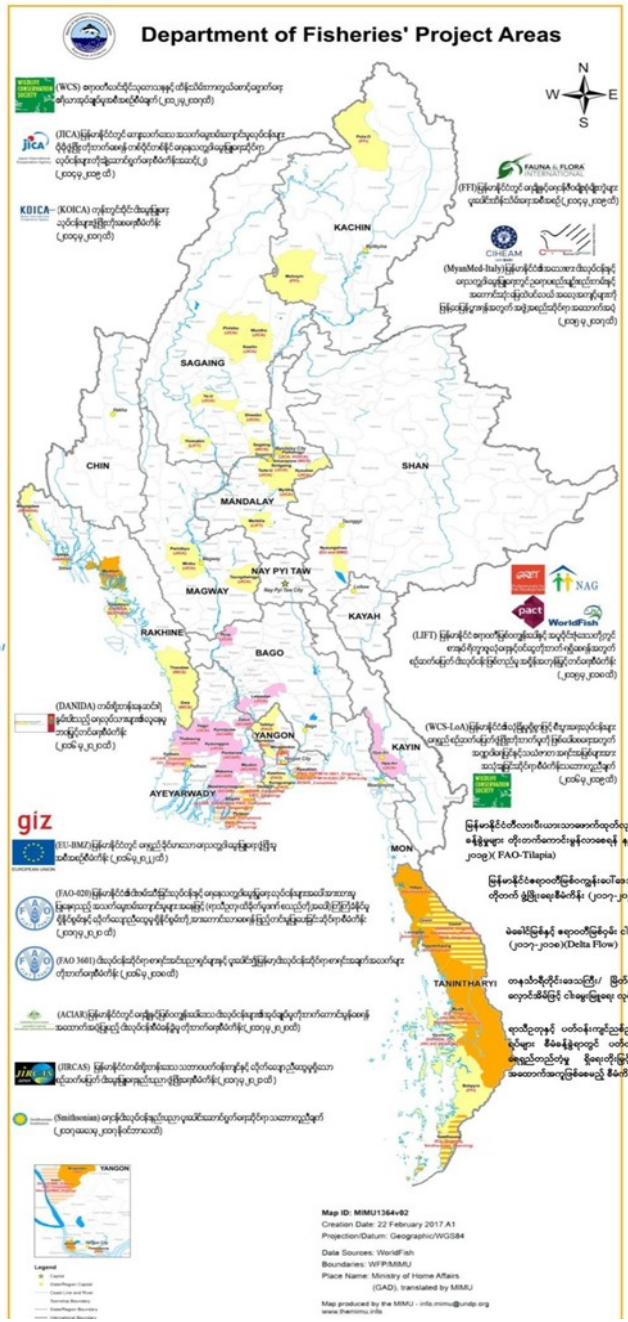
No.	Name/Position	University	Duration	Graduation	Study Field
1.	U Myat Thiha Saw Assistant Fishery Officer	University of Tasmania (Austria)	19-1-2015 to 31.12.2018	B.Sc (Marine Environment)	Sustainable Economic Development (Including Agriculture and Food Security)
2.	Daw Wah Wah Phu Deputy Fishery Officer	Pukyong National University (Korea)	18.9.2017 to 18.8.2019	Ph.D (Fishery Biology)	Fishery Biology
3.	U Ar Kar Myo Assistant Fishery Officer	Kasetsart University	4.8.2016 to 31.12.2018	M.Sc (Fishing Technology)	Fishing Technology
4.	U Ye Pyae Naing Deputy Assistant Fishery Officer	Pukyong National University (Korea)	1.9.2016 to 30.8.2018	Graduate Course in Fisheries Science	Fisheries Science
5.	U Min Khine Assistant Fishery Officer	Pukyong National University (Korea)	27.8.2017 to 20.12.2018	M.Sc (Fisheries Science)	Research & Fisheries Management
6.	Daw Cho Mar Oo Assistant Fishery Officer	Pukyong National University (Korea)	27.8.2017 to 20.12.2018	M.Sc (Fisheries Science)	Fisheries Management & Economic
7.	U Aung Ko Oo Assistant Fishery Officer	Auckland University of Technology (New Zeland)	5.1.2018 to 25.2.2020	M.Sc (Research)	Food Science
8.	U Zaw Mann Assistant Fisheries Officer	World Fisheries University	26.3.2018 to 22.2. 2019	Diploma	Fisheries Technology Instructor and Leader Training Program
9.	Daw Thida Win Assistant Fisheries Officer	World Fisheries University	26.3.2018 to 22.2. 2019	Diploma	Fisheries Technology Instructor and Leader Training Program

Projects cooperation with Projects cooperation with Development Partners

1. Small-scale aquaculture Extension for Promotion of Livelihood of Rural Community in CDZ Project" (SAEP II) (US$- 4 millions) funded by Japan International Cooperation Agency (JICA) in Central Dry Zone from March , 2014 to 2019 , is focusing on small scale aquaculture in central dry area including Mandalay, Sagaing and Magway Region . **(Project Manager: U Saw Lah Paw, Director)**
2. Ayeyarwaddy Dolphin Research and Protected Area Management Plan (WCS) (Technical Assistant) supported by Wildlife Conservation Society (WCS), from 2017 to 2022, along the Ayeyarwady River in Mandalay and Saging Regions is to protect and conserve the Ayeyarwady Dolphin. **(Project Manager : Daw Thida Moe , Fishery Officer)**
3. Project for Development of Inland Fish Farming Technology: (US$ 4.41 Million) funded by Korea International Cooperation Agency (KOICA) and to be implemented at Thayetkone Fisheries Station in Mandalay from 2014 to 2019. **(Project Manager: Dr Aung Naing Oo, Deputy Director)**
4. Collaborative Program to Support the Conservation of Marine and Freshwater Biodiversity in Myanmar) (Technical Assistant) support by Flora and Fauna International (FFI) from 2014 to 2019, Conserving endangered freshwater species and ecosystems, and environmental services in Kachin and Tanintharyi Regions. Conserving marine species and ecosystems and environmental services in Tanintharyi and Ayeyarwady Regions and Rakhine State. **(Project Manager : Dr Thet YuYu Swe, Fishery Officer)**
5. Promoting sustainable growth of aquaculture in Myanmar to improve food security and income for communities in the Ayeyarwady Delta and Central Dry Zone (MyCulture) (US$- 3.29 millions) funded by WorldFish Center from 2015 -2018 in Ayeyarwady Delta and Central Dry Zone. **(Project Manager: U Nyunt Win, Deputy Director)**
6. Spearheading Marine Conservation in Myanmar : A national program for marine spatial planning and fisheries reform (WCS-LoA)(US$-0.210) funded by Wildlife Conservation Society (WCS), from 2016 to 2019 , Rakhine Coastal and Tanintharyi Coastal.**(Project Manager :Daw Thida Moe , Fishery Officer)**
7. Myanmar Sustainable Aquaculture Programme (MYSAP) (Euro-22.5 millions) funded by German International Agency(GIZ) from 2016 to 2021, Ayeyarwady Delta and Central Dry Zone , Rakhine State and Shan State **(Project Manager: U Saw Lah Paw Wah , Director)**
8. Sustainable Coastal Fisheries (DANIDA) (US$- 10 millions) funded by Danish International Development Agency from 2017- 2020 , Tanintharyi (Myeik), Rakhine (Maung Taw and Sitt tawe) **(Project Manager:Dr. Htun Thein , Deputy Director)**

9. Improvement of Data Collection on fisheries and Aquaculture Production : Pilot system for the Yangon Region (FAO-3601) (US$- 0.250 millions) funded by Food and Agriculture Organization- FAO from 2017 - 2019, Yangon Division **(Project Manager: U Hla Htay, Deputy Director)**
10. Development of Sustainable and environmental friendly aquaculture techniques in coastal waters in Myanmar (JIRCAS) (JP Yan 15 millions) funded by Japan International Research Center for Agriculture Sciences from 2017–2021 , Tanintharyi Division and Myeik Coastal. **(Project Manager: Dr. Aung Naing Oo, Deputy Director)**
11. Strengthening the adaptive capacity and resilience of fisheries and aquaculture-dependent livelihoods in Myanmar(FishAdapt)(US$-6 millions) funded by Food and Agriculture Organization –FAO from 2017 to 2021, Yangon (Kyauk Tan) , Ayeyarwaddy (Amar) and Rakhine (Mye bone) **(Project Manager: Dr. Kyaw Kyaw, Deputy Director)**
12. Improving Fishery Management in Support of Better Governance of Myanmar's Inland and Delta Fisheries (MYFish-2) (AUD-2.64 millions) funded by WorldFish Center from 2017-2020 , Ayeyarwady Delta and Central Dry Zone. **(Project Manager: U Nyunt Win, Deputy Director)**
13. Smithsonian Conservation Biology Institute (Smithsonian) (Technical Assistant) support by Smithsonian Conservation Biology Institute (USA) from2017 to2018,Tanintharyi Division , Dawei and Myeik , kawthaung .
14. Improvement of Tilapia seed production and grow-out culture management in Myanmar (FAO-3606) (US$0.204) funded by FAO from 2017-2019, Yangon Division **(Project Manager : Dr. Aung Naing Oo, Deputy Director)**
15. The Development of Rice-Fish System (RFS) in the Ayeyarwady Delta Myanmar (Rice-Fish) (AUD 2.6) funded by WorldFish Center from 2017-2021, Ayeyarwady Delta (**Project Manager: U Nyunt Win, Deputy Director)**
16. Development of Marine Cage Fish Farming (NDG) (Technical Assistant) support by Norway Development Group from 2018-2020, Tanintharyi Division **(Project Manager : Dr. Htun Thein, Deputy Director)**
17. Supporting the Application of the Ecosystem Approach to Fisheries Management Considering Climate and Pollution Impacts (EAF- Nansen) (Technical Assistant) support by FAO from 2018-2021, Ayeyarwady, Rakhine and Tanintharyi **(Project Manager : Dr. Htun Thein, Deputy Director)**

Department of Fisheries' Project Area



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.

Statistics is obtained through three main processes, data collection, data compilation and analysis, and dissemination of it. 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 are as follow;

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

There are many goals in fishery statistics, such as sustainable use of resources, for food security, to get income for exchange earning, to increase fish production, and to know about the livelihood of fishers and fish-farmers, biodiversity and environment. However, without reliable, relevant and timely data, the effective fishery management and policy-making are impossible. That is why, fishery statistics is necessary in every planning, and in every activity in the business of the fisheries.

Department of Fisheries is basic data collection, processing and dissemination and the existing system runs as follows: -

- There are 107 township offices under Department of Fisheries. Township fisheries officers have to provide and support in collecting the fishery data. That is why, we can say that all township fisheries officers are as the basic data collecting officers who are, at the same time, having their own duties to perform the works on fisheries.
- Reporting of the statistical data and collection from Township level to District and then to State and Division where the data is edited and collected, before being sent to statistical office, HQ of DoF. All organized data in DoF are processed step by step before presenting final results. Data processing is done either manually or using computers.

Department of Fisheries of Myanmar has been collaborating with the Central Statistical Organization (CSO), and Planning Department and other international organizations as well as FAO and SEAFDEC.

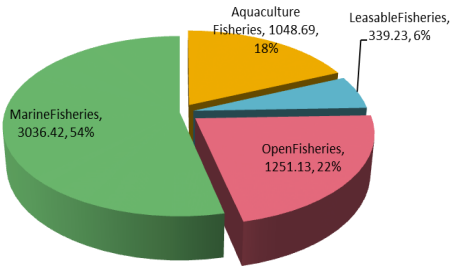
FISHERY STATISTICS

Table.1. FISHERY PRODUCTION (2008-2009 to 2017-2018)

Thousand Metric Ton

No.	Year	Total	Aquaculture	Leasable Fisheries	Open Fisheries	Marine Fisheries
1.	2008-2009	3542.19	775.25	209.72	689.71	1867.51
2.	2009-2010	3921.97	858.76	237.46	764.97	2060.78
3.	2010-2011	4163.46	830.48	250.04	913.12	2169.82
4.	2011-2012	4478.35	899.05	282.64	963.82	2332.84
5.	2012-2013	4716.22	929.38	290.00	1012.97	2483.87
6.	2013-2014	5047.40	964.12	304.44	1076.59	2702.25
7.	2014-2015	5316.95	999.63	315.36	1147.76	2854.20
8.	2015-2016	5591.83	1014.42	338.69	1241.98	2996.74
9.	2016-2017	5675.47	1048.69	339.23	1251.13	3036.42
10.	2017-2018	5877.46	1130.35	341.02	1253.95	3152.14

2016-2017



2017-2018

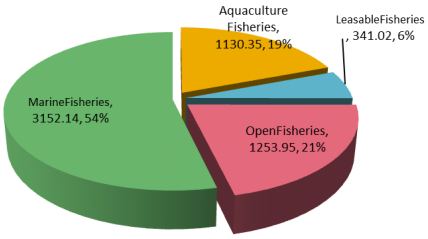


Figure.1. Fishery Production (2016-2017) & (2017-2018)

Table.2. TOTAL AQUACULTURE PONDS AND PRODUCTION

No.	Year	Area of Aquaculture Ponds (Acre)	Production of Aquaculture Ponds (Thousand Metric Ton)
1.	2008-2009	440585	775.25
2.	2009-2010	442702	858.76
3.	2010-2011	443695	830.48
4.	2011-2012	448468	899.05
5.	2012-2013	449692	929.38
6.	2013-2014	450324	964.12
7.	2014-2015	469153	999.63
8.	2015-2016	478002	1014.42
9.	2016-2017	487525	1048.69
10.	2017-2018	491345	1130.35

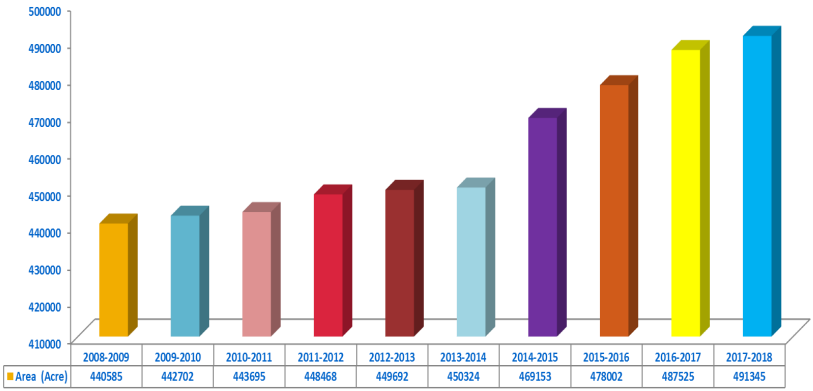


Figure.2: Area of Aquaculture Pond (2008-2009 to 2017-2018)

Table. 3.TOTAL AREA OF AQUACULTURE PONDS

Unit - Acre

No.	Year	Area		
		Fish Pond	Shrimp Pond	Total
1.	2008-2009	215930	224655	440585
2.	2009-2010	217835	224867	442702
3.	2010-2011	218746	224949	443695
4.	2011-2012	220171	228297	448468
5.	2012-2013	221395	228297	449692
6.	2013-2014	222028	228296	450324
7.	2014-2015	232515	236638	469153
8.	2015-2016	239671	238331	478002
9.	2016-2017	245807	241718	487525
10.	2017-2018	247007	244338	491345

Table.4.1. AQUACULTURE POND BY STATES AND REGIONS

Unit-Acre

No.	States/ Regions	2008-2009			2009-2010			2010-2011		
		Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total
1.	Kachin	1408	-	1408	1492	-	1492	1938	-	1938
2.	Kayah	510	-	510	400	-	480	638	-	638
3.	Kayin	399	80	479	629	80	629	400	80	480
4.	Chin	101	-	101	101	-	101	108	-	108
5.	Sagaing	4569	-	4569	4794	-	4794	5159	-	5159
6.	Taninthayi	341	821	1162	351	821	1172	351	821	1172
7.	Bago	26276	12	26288	25888	12	25900	25748	12	25760
8.	Magway	419	-	419	426	-	426	430	-	430
9.	Mandalay	6411	-	6411	6783	-	6783	6898	-	6898
10.	Mon	884	1125	2009	894	1125	2019	920	1125	2045
11.	Rakhine	-	155533	155533	-	155533	155533	-	155533	155533
12.	Yangon	59835	10229	70064	59870	10229	70099	59870	10229	70099
13.	Shan	3268	-	3268	3298	-	3298	3377	-	3377
14.	Ayeyarwady	111509	56855	168364	112909	57067	169976	112909	57149	170058
15.	NayPyi Taw	-	-	-	-	-	-	-	-	-
	Total	**215930**	**224655**	**440585**	**217835**	**224867**	**442702**	**218746**	**224949**	**443695**

Table.4.2.AQUACULTURE POND BY STATES AND REGIONS

Unit-Acre

No.	States/ Regions	2011-2012			2012-2013			2013-2014		
		Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total
1.	Kachin	1910	-	1910	1990	-	1990	2168	-	2168
2.	Kayah	673	-	673	748	-	748	760	-	760
3.	Kayin	400	80	480	464	80	544	464	80	544
4.	Chin	107	-	107	296	-	296	296	-	296
5.	Sagaing	5465	-	5465	5809	-	5809	6023	-	6023
6.	Taninthayi	922	4141	5063	922	4141	5063	923	4140	5063
7.	Bago	26003	40	26043	26009	40	26049	26014	40	26054
8.	Magway	425	-	425	425	-	425	425	-	425
9.	Mandalay	7154	-	7154	7416	-	7416	7624	-	7624
10.	Mon	969	1125	2094	969	1125	2094	975	1125	2100
11.	Rakhine	-	155533	155533	20	155533	155553	20	155533	155553
12.	Yangon	59864	10229	70093	59864	10229	70093	59864	10229	70093
13.	Shan	3387	-	3387	3409	-	3409	3409	-	3409
14.	Ayeyarwady	112892	57149	170041	112892	57149	170041	112892	57149	170041
15.	Nay Pyi Taw	-	-	-	162	-	162	171	-	171
	Total	**220171**	**228297**	**448468**	**221395**	**228297**	**449692**	**222028**	**228296**	**450324**

Table.4.2.AQUACULTURE POND BY STATES AND REGIONS

Unit-Acre

No.	States/ Regions	2014-2015			2015-2016			2016-2017			2017-2018		
		Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total	Fish Pond	Shrimp Pond	Total
1.	Kachin	2313	-	2313	2312	-	2312	2312	-	2312	2344		2344
2.	Kayah	798	-	798	819	-	819	893	-	893	893		893
3.	Kayin	589	80	669	675	130	805	711	130	841	731	130	861
4.	Chin	296	-	296	296	-	296	296	-	296	296		296
5.	Sagaing	6374	-	6374	7128	-	7128	7580	-	7580	7580		7580
6.	Taninthayi	1065	4140	5205	1120	4138	5258	1120	4138	5258	1120	4138	5258
7.	Bago	27158	40	27198	28324	40	28364	31121	40	31161	31146	40	31186
8.	Magway	425	-	425	425	-	425	425	-	425	425		425
9.	Mandalay	7609	-	7609	7970	-	7970	7902	-	7902	7873		7873
10.	Mon	979	1125	2104	995	1125	2120	995	1125	2120	1001	1125	2126
11.	Rakhine	20	155533	155553	20	156488	156508	20	156489	156509	20	156489	156509
12.	Yangon	65848	17829	83677	66015	18442	84457	67038	18916	85954	66444	18681	85125
13.	Shan	3408	-	3408	3408	-	3408	3408	-	3408	3408		3408
14.	Ayeyarwady	115462	57892	173353	119993	57968	177961	121811	60880	182691	123551	63736	187287
15.	Nay Pyi Taw	171	-	171	171	-	171	175	-	175	175	-	175
	Total	**232515**	**236638**	**469153**	**239671**	**238331**	**478002**	**245807**	**241718**	**487525**	**247007**	**244338**	**491345**

Table. 5. THE PRODUCTION OF LEASABLE FISHERIES AND OPEN FISHERIES

No.	Year	Total number of Leasable (Number)	Production of Leasable Fisheries (Thousand Metric Ton)	Production of Open Fisheries (Thousand Metric Ton)	Total Production of Inland Fisheries (Thousand Metric Ton)
1.	2008-2009	3453	209.72	689.71	899.43
2.	2009-2010	3451	237.46	764.97	1002.43
3.	2010-2011	3458	250.04	913.12	1163.16
4.	2011-2012	3415	282.64	963.82	1246.46
5.	2012-2013	3409	290.00	1012.97	1302.97
6.	2013-2014	3290	304.44	1076.59	1381.03
7.	2014-2015	3304	315.36	1147.76	1463.12
8.	2015-2016	3312	338.69	1241.98	1580.67
9.	2016-2017	3299	339.23	1251.13	1590.36
10.	2017-2018	3243	341.02	1253.95	1594.97

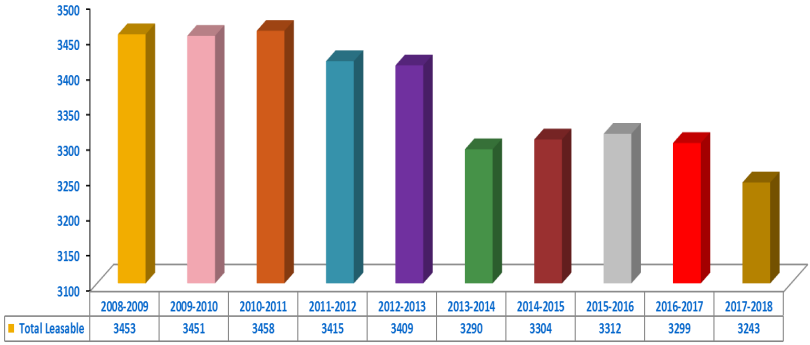


Figure 3: Number of Leasable Fisheries in Myanmar (2008-2009 to 2017-2018)

Table.6. FISHING VESSELS

Unit - Number

No.	Year	Small Fishing Boat		Off-shore Vessels		Total
		Powered Boat	Non-Powered Boat	National	Foreign	
1.	2008-2009	14025	14645	1758	356	30784
2.	2009-2010	13788	17054	2077	391	33310
3.	2010-2011	13823	15548	2196	396	31963
4.	2011-2012	12288	15463	2598	264	30613
5.	2012-2013	12157	12757	2724	150	27788
6.	2013-2014	12490	13732	2736	153	29111
7.	2014-2015	12240	13391	2840	52	28523
8.	2015-2016	13831	12583	3030	11	29455
9.	2016-2017	16012	10704	3168	48	29932
10.	2017-2018	15084	6802	3172	5	25077

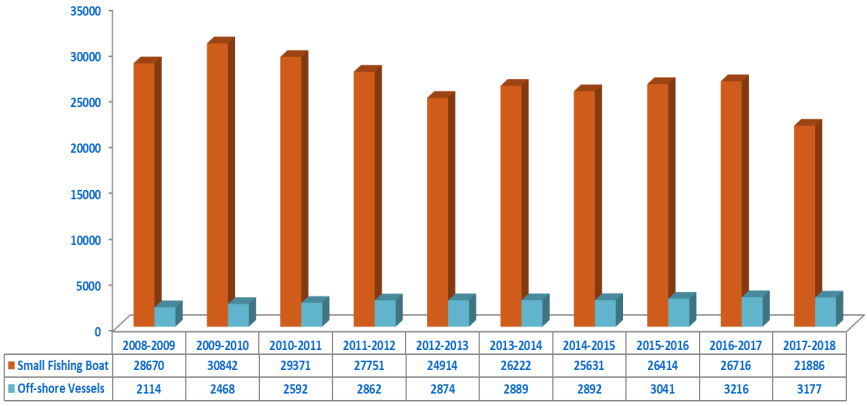


Figure4: Number of Fishing Boats and Off –Shore Vessels

Table. 7.1. 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.	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**
2.	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**
3.	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**
4.	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**
6.	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**

Table.7.2. 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.	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**
7.	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**
8.	2015-2016	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**
9.	2016-2017	Head office	706	47	154	1	-	20	928
		Rakhine	-	5	-	-	-	4	9
		Taninthayi	637	270	4	30	395	96	1432
		Ayeyarwady	-	-	477	-	-	1	478
		Mon	-	-	321	-	-	-	321
		Yangon	-	-	-	-	-	-	-
	Total		**1343**	**322**	**956**	**31**	**395**	**121**	**3168**
10.	2017-2018	Head office	729	68	150	1	-	19	967
		Rakhine	-	5	-	-	-	4	9
		Taninthayi	668	256	4	22	387	89	1426
		Ayeyarwady	-	-	448	-	-	1	449
		Mon	-	-	321	-	-	-	321
		Yangon	-	-	-	-	-	-	-
	Total		**1397**	**329**	**923**	**23**	**387**	**113**	**3172**

Table.8.FISHERY EXPORTS

Quantity - Metric Ton
Value - US $ in Million

No.	Year	Fish		Prawns		Others		Total	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1.	2008-2009	234060.74	273.27	18382.10	88.85	72267.70	121.11	324710.54	483.23
2.	2009-2010	277823.74	309.86	17439.31	56.33	79829.38	130.40	375092.43	496.59
3.	2010-2011	273043.74	342.44	19142.91	68.66	81706.06	144.41	373892.71	555.51
4.	2011-2012	283688.76	396.27	17995.03	86.19	85297.53	171.39	386981.32	653.85
5.	2012-2013	266464.97	378.05	17267.93	89.29	93112.79	185.50	376845.69	652.84
6.	2013-2014	237142.31	286.93	16508.97	61.98	91616.08	187.36	345267.36	536.27
7.	2014-2015	225974.93	258.61	17527.33	56.89	94788.33	166.75	338290.59	482.25
8.	2015-2016	246970.93	274.25	13673.49	49.64	108326.47	178.74	368970.89	502.63
9.	2016-2017	290580.04	319.04	13082.46	58.21	135044.01	228.57	438706.51	605.82
10.	2017-2018	394135.80	385.81	15905.44	60.78	158186.09	265.13	568227.33	711.72

Figure 5: Fish and Fishery Product Exported in Myanmar (2008-2009 to 2017-2018)

Table.9. TOP TEN SPECIES OF EXPORTED FISH AND FISHERIES PRODUCT OF MYANMAR (2017-2018)

No.	Species (Common Name)		MT (Ordinary)	US$ (Million)
1.	Rohu		65063.949	66.536
2.	Live Mud Crab		15562.011	48.272
3.	Fish Meal		38409.125	37.587
4.	Ribbon Fish		21205.179	34.871
5.	Hilsa		11379.949	32.172
6.	Live Eel		8650.734	28.602
7.	Soft Shell Crab		2882.985	26.561
8.	Pink		9992.875	23.346
9.	Squid		13362.519	22.846
10.	Tiger		2902.446	20.142

Table.10.FISHERY PRODUCT EXPORTED BY TRADING COUNTRIES (2017-2018)

No	Country	Fish		Prawn		Other		Total	
		MT	US$-Million	MT	US$-Million	MT	US$-Million	MT	US$-Million
1.	Taiwan	85.157	0.366	337.571	1.461	489.532	2.019	912.260	3.846
2.	Malaysia	4110.531	6.274	1170.591	6.231	7321.920	20.820	12603.042	33.325
3.	Oman	3730.232	3.948	8.775	0.017	87.761	0.194	3826.768	4.159
4.	Saudi	24830.859	27.850	3.490	0.006	577.633	1.023	25411.982	28.879
5.	U.S.A	3914.051	7.316	266.488	2.418	905.698	9.118	5086.237	18.852
6.	Singapore	26257.845	33.022	313.631	0.708	836.186	2.907	27407.662	36.637
7.	China	26721.224	51.002	3524.276	9.119	87545.676	137.782	117791.176	197.903
8.	Hong Kong	112.591	0.274	1346.854	8.509	396.451	4.271	1855.896	13.054
9.	Bahrain	2807.228	2.981	0.798	0.001	17.208	0.033	2825.234	3.015
10.	U.K	7159.019	13.662	18.774	0.035	209.105	0.641	7386.898	14.338
11.	Kuwait	7782.193	8.274	1.887	0.005	45.779	0.084	7829.859	8.363
12.	U.A E	13593.730	14.786	141.623	0.317	80.580	0.322	13815.933	15.425
13.	Japan	85.088	0.120	4146.847	19.262	2850.628	8.206	7082.563	27.588
14.	Bangladesh	9881.686	12.658	35.432	0.196	1778.957	1.438	11696.075	14.292
15.	Iraq	5385.364	5.475	-	-	-	-	5385.364	5.475
16.	Thailand	246308.380	180.312	3660.533	8.853	52016.021	69.643	301984.934	258.808
17.	Qatar	4201.257	4.785	16.992	0.029	74.078	0.175	4292.327	4.989
18.	Australia	601.368	1.201	-	-	464.543	2.085	1065.911	3.286
19.	Italy	1926.670	2.917	0.612	0.003	75.471	0.136	2002.753	3.056
20.	Korea	398.863	0.566	23.669	0.120	966.295	1.936	1388.827	2.622
21.	India	1142.663	3.555	-	-	32.700	0.023	1175.363	3.578
22.	France	-	-	-	-	98.751	0.380	98.751	0.380
23.	Vietnam	288.236	0.371	698.996	2.423	1124.376	1.387	2111.608	4.181
24.	Sweden	334.669	0.450	-	-	-	-	334.669	0.450
25.	Greece	71.452	0.085	-	-	-	-	71.452	0.085
26.	Cyprus	10.210	0.013	-	-	0.200	0.001	10.410	0.014
27.	Labenon	72.745	0.122	-	-	2.600	0.006	75.345	0.128
28.	South Africa	381.417	0.490	3.271	0.010	7.475	0.019	392.163	0.519
29.	Brunei	126.950	0.158	0.017	0.000	5.078	0.030	132.045	0.188
30.	Belgium	154.118	0.229	143.592	0.869	2.250	0.005	299.960	1.103
31.	Denmark	84.200	0.125	0.013	0.000	-	-	84.213	0.125
32.	Newzealand	5.500	0.020	0.678	0.005	23.051	0.147	29.229	0.172
33.	Canada	697.633	1.248	0.075	0.000	1.405	0.004	699.113	1.252
34.	Pakistan	218.300	0.222	-	-	26.290	0.080	244.590	0.302
35.	Germany	23.716	0.042	-	-	-	-	23.716	0.042
36.	Jordon	154.650	0.216	2.625	0.006	1.288	0.002	158.563	0.224
37.	Netherland	374.086	0.546	-	-	-	-	374.086	0.546
38.	Indonesia	-	-	33.480	0.161	105.000	0.084	138.480	0.245
39.	Mordives	33.053	0.039	1.516	0.004	-	-	34.569	0.043
40.	Srilanka	-	-	-	-	2.000	0.003	2.000	0.003
41.	Ireland	44.738	0.069	-	-	-	-	44.738	0.069
42.	Bulgaria	-	-	2.338	0.008	5.763	0.010	8.101	0.018
43.	Poland	-	-	-	-	4.400	0.015	4.400	0.015
44.	Turkey	24.000	0.024	-	-	-	-	24.000	0.024
45.	Macau	0.120	0.000	-	-	3.942	0.099	4.062	0.099
	Total	**394135.792**	**385.813**	**15905.444**	**60.776**	**158186.091**	**265.128**	**568227.327**	**711.717**

Table.11.1.TOP TEN COUNTRIES EXPORTED FISHERY PRODUCTS

No.	2008-2009			2009-2010		
	Countries	MT	US-Million	Countries	MT	US-Million
1.	Singapore	56753.61	119.044	China	55991.33	105.076
2.	China	58921.26	106.153	Thailand	122817.59	99.229
3.	Thailand	89489.51	76.978	Singapore	46424.56	96.257
4.	Malaysia	23004.36	41.260	Kuwait	58747.92	52.964
5.	Kuwait	34423.65	31.844	Malaysia	21351.10	36.127
6.	Japan	6514.06	23.400	Saudi	20426.63	23.272
7.	Saudi	17702.43	21.344	Japan	6215.54	16.908
8.	Bangladesh	14694.98	18.686	UAE	13517.21	16.784
9.	UAE	10610.28	13.782	Bangladesh	13993.34	16.257
10.	UK	5192.63	10.674	UK	6285.68	12.427
		2010-2011			2011-2012	
1.	China	77914.27	179.704	China	92775.645	258.759
2.	Thailand	134634.31	110.595	Thailand	136278.599	124.457
3.	Singapore	25413.33	59.378	Malaysia	23325.904	53.623
4.	Kuwait	50643.82	56.683	Kuwait	45496.48	51.155
5.	Malaysia	20669.93	39.419	Singapore	15881.889	34.522
6.	Saudi	19474.26	24.673	Japan	6839.415	30.361
7.	Japan	7197.15	21.882	Saudi	20771.696	28.610
8.	UAE	12292.49	17.789	Bangladesh	17296.858	23.124
9.	Bangladesh	11372.95	14.166	UAE	16045.361	21.320
10.	UK	6488.43	13.085	UK	6275.849	13.845
		2012-2013			2013-2014	
1.	Chian	90780.734	244.249	China	82665.926	199.290
2.	Thailand	137631.665	133.165	Thailand	126645.544	128.980
3.	Singapore	26584.477	49.748	Malaysia	16459.550	35.285
4.	Kuwait	34515.926	49.153	Kuwait	26196.712	27.051
5.	Malaysia	19288.339	45.678	Singapore	20086.003	25.220
6.	Japan	6895.203	34.971	Saudi	19672.380	24.370
7.	Saudi	21738.835	31.806	Japan	6490.001	23.511
8.	UAE	15142.596	19.424	UAE	16008.274	18.271
9.	UK	6341.289	14.561	UK	7123.743	13.839
10.	Bangladeah	9529.391	11.978	Bangladesh	8190.575	8.500

Table.11.2.TOP TEN COUNTRIES EXPORTED FISHERY PRODUCTS

No.	2014-2015			2015-2016		
	Countries	MT	US-Million	Countries	MT	US-Million
1.	Chian	75732.900	169.685	China	78217.835	161.491
2.	Thailand	127537.529	127.750	Thailand	149567.763	143.170
3.	Malaysia	16769.467	31.400	Malaysia	13682.229	34.233
4.	Singapore	21453.699	22.959	Singapore	27049.903	29.655
5.	Saudi	20689.382	22.353	Saudi	20862.038	22.223
6.	Kuwait	23428.406	21.935	Kuwait	20986.639	19.793
7.	Japan	6750.174	18.846	Japan	5371.332	17.325
8.	UAE	13838.681	14.588	UAE	14189.191	13.787
9.	UK	5654.002	10.189	UK	7008.604	11.897
10.	Bangladesh	7602.536	9.013	USA	3340.950	10.031

No.	2016-2017			2017-2018		
	Countries	MT	US-Million	Countries	MT	US-Million
1.	Thailand	211097.950	198.709	Thailand	301984.934	258.808
2.	China	100200.229	190.119	China	117797.366	197.963
3.	Malaysia	11629.971	35.349	Singapore	27407.662	36.637
4.	Japan	6049.425	24.583	Malaysia	12603.042	33.325
5.	Saudi	21129.795	23.919	Saudi	25411.982	28.879
6.	Singapore	15076.495	22.710	Japan	7132.693	27.672
7.	Bangladesh	11117.243	15.393	USA	5086.237	18.852
8.	UAE	13884.501	14.897	UAE	13815.933	15.425
9.	UK	6609.502	12.516	UK	7386.898	14.338
10.	USA	3525.811	12.146	Bangladesh	11696.075	14.292

Table.12. FISH SUPPLY IN YANGON

Unit - Thousand Metric Ton

No.	Year	Production		
		Fresh Water	Marine	Total
1.	2008-2009	78.83	103.69	182.52
2.	2009-2010	91.39	132.47	223.86
3.	2010-2011	93.07	138.44	231.51
4.	2011-2012	97.67	152.94	250.61
5.	2012-2013	94.68	167.01	261.69
6.	2013-2014	135.04	166.42	301.46
7.	2014-2015	142.45	152.95	295.40
8.	2015-2016	127.56	159.46	287.02
9.	2016-2017	124.65	170.58	295.23
10.	2017-2018	114.45	153.44	267.89

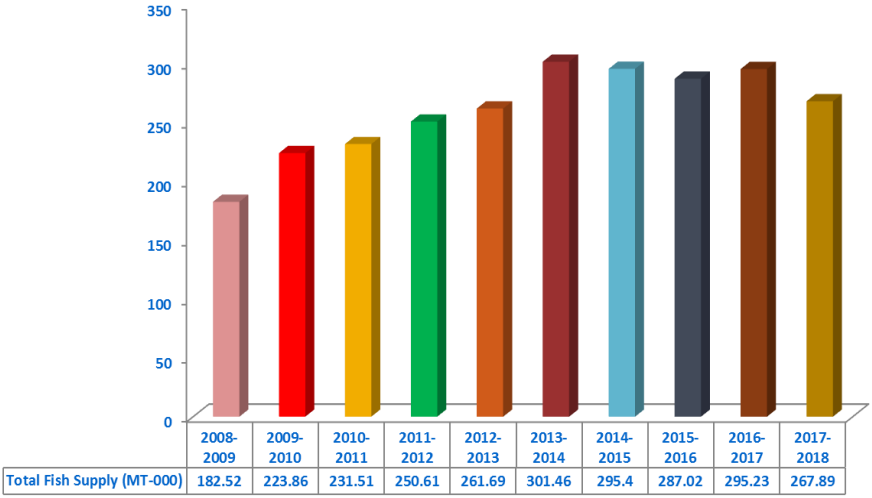


Figure 6: Fish Supply in Yangon (2008-2009 to 2017-2018)

Table.13. 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.	2017-2018	53.41	5877459	1763237	568227	66

*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. 14.1. SEED PRODUCTION BY FISH HATCHERIES UNDER DOF

Unit: Million

No.	Myanmar Name	Common Name	Scientific Name	2008-09	2009-10	2010-11	2011-12	2012-13
1.	Nga Myit Chin	Rohu	*Labeo rohita*	530.733	527.260	460.179	535.409	549.201
2.	Shwe Wa Nga Gyin	Common Carp	*Cyprinus carpio*	56.783	77.370	83.882	49.223	45.579
3.	Myetsar Nga Gyin	Grass Carp	*Ctenopharyngo-don idella*	5.881	4.170	8.397	3.833	13.400
4.	Nga Khaung Pwa	Catla	*Catla catla*	4.950	5.190	11.733	6.547	9.637
5.	Tilapia	Tilapia	*Tilapia spp:*	12.999	20.060	18.363	17.883	13.063
6.	Ngwe Yaung Nga Gyin	Silver Carp	*Hypophthal-michtys molitrix*	3.244	3.380	5.629	6.894	5.246
7.	Khaung Gyi Nga Gyin	Big Head	*Aristichthys nobilis*	2.300	2.190	3.8	3.539	2.305
8.	Nga Khu	Cat Fish	*Clarias batrachus*	-	-	-	0.050	-
9.	Nga Dan	Stripped Catfish	*Pangasius sutchi*	10.076	4.660	9.384	5.660	8.976
10.	Nga Phan Ma	Rohtee	*Rohtee alfrediana*	-	-	-	-	-
11.	Nga Gyin Phyu	Mrigal	*Cirrhina mrigala*	1.825	2.850	6.652	4.554	6.087
12.	Pa Cu (Ye Cho Nga Mote)	Fresh water pomfret	*Pirictus spp:*	10.809	3.290	6.733	3.690	7.633
13	Nga Khone Ma	Tarpian	*Barbodes gonionotus*	68.712	86.230	181.439	112.761	127.863
14.	Nga Thyine	Minor Carp	*Leabo Fdolizkae*	-	0.050	-	-	-
15.	Be Lar	Snakeskin gourami	*Trichogester pectoralis*	-	0.060	-	0.020	-
16.	Vietnam Nga Dan	Stripped Catfish	*Pangasius bacourti*	-	-	0.060	-	-
17.	Nga Kye	Sconpion catfish	*Heteropneustcs fossilis*	-	-	0.002	0.300	0.250
18.	Nga Phane	Nga Phane	*Cyprinus intha*	-	-	-	0.003	0.218
19.	Sultan	Sultan Fish	*Leptobanbus hoevenii*	-	-	-	0.004	-
20.	Nga Ohn Tone	Nandina	*Labeo nandina*	-	-	-	-	0.065
21.	Nga Dane	Kuria Labeo	*Labeo gonius*	-	-	-	-	0.100
22.	Taung Paw Nga Thar Lauk	Streaked prochilod	*Prochilodus line-atus*	-	-	-	-	-
	Total			**708.312**	**736.760**	**796.253**	**750.370**	**789.623**

Table.14.2. SEED PRODUCTION BY FISH HATCHERIES UNDER DOF

Unit - Million

No.	Myanmar Name	Common Name	Scientific Name	2013-14	2014-15	2015-16	2016-17	2017-18
1.	Nga Myit Chin	Rohu	*Labeo rohita*	384.861	397.569	419.600	455.631	434.623
2.	Shwe Wa Nga Gyin	Common Carp	*Cyprinus carpio*	41.914	38.751	35.981	46.795	41.818
3.	Myetsar Nga Gyin	Grass Carp	*Ctenopharyngo-don idella*	5.598	5.483	5.378	7.074	7.337
4.	Nga Khaung Pwa	Catla	*Catla catla*	7.054	6.976	6.877	9.191	7.987
5.	Tilapia	Tilapia	*Tilapia spp:*	13.571	11.492	11.792	15.446	14.329
6.	Ngwe Yaung Nga Gyin	Silver Carp	*Hypophthal-michtys molitrix*	5.533	4.715	4.146	6.432	6.72
7.	Khaung Gyi Nga Gyin	Big Head	*Aristichthys nobilis*	2.785	2.203	2.830	2.124	3.153
8.	Nga Khu	Cat Fish	*Clarias batrachus*	-	0.001	-	-	-
9.	Nga Dan	Stripped Catfish	*Pangasius sutchi*	7.111	5.675	7.787	8.301	9.310
10.	Nga Phan Ma	Rohtee	*Rohtee alfrediana*	-	0.105	-	0.055	-
11.	Nga Gyin Phyu	Mrigal	*Cirrhina mrigala*	2.854	2.275	3.190	4.735	6.197
12.	Pa Cu (Ye Cho Nga Mote)	Fresh water pomfret	*Pirictus spp:*	5.569	7.325	8.265	7.810	8.455
13	Nga Khone Ma	Tarpian	*Barbodes gonionotus*	73.478	89.541	100.879	79.120	89.759
14.	Nga Thyine	Minor Carp	*Leabo Fdolizkae*	-	-	-	0.152	0.015
15.	Be Lar	Snakeskin gourami	*Trichogester pectoralis*	-	-	0.170	0.186	-
16.	Vietnam Nga Dan	Stripped Catfish	*Pangasius bacourti*	-	-	-	-	
17.	Nga Kye	Sconpion catfish	*Heteropneustcs fossilis*	0.100	0.050	0.100	0.110	0.120
18.	Nga Phane	Nga Phane	*Cyprinus intha*	0.353	1.651	1.103	0.610	1.050
19.	Sultan	Sultan Fish	*Leptobanbus hoevenii*	0.060	-	-	-	0.075
20.	Nga Ohn Tone	Nandina	*Labeo nandina*	-	-	-	-	-
21.	Nga Dane	Kuria Labeo	*Labeo gonius*	-	-	0.050	0.100	0.10
22.	Taung Paw Nga Thar Lauk	Streaked prochilod	*Prochilodus lineatus*	0.565	1.600	0.550	0.220	0.12
	Total			**551.406**	**575.412**	**608.698**	**644.092**	**631.168**

Table.15.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.16.FISH HATCHERIES UNDER DOF (2011-2012)

Unit - Million

No.	Fish Hatcheries	Location	Production
	Yangon Region		**180.268**
1.	Hlaw Kar	Mingalardone Township	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. 17. FISH HATCHERIES UNDER DOF(2012-2013)

Unit - Million

No.	Fish Hatcheries	Location	Production
	Yangon Region		**177.925**
1.	Hlaw Kar	Mingalardone Township	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.18. FISH HATCHERIES UNDER DOF (2013-2014)

Unit - Million

No.	Fish Hatcheries	Location	Production
	Yangon Region		**141.582**
1.	Hlaw Kar	Mingalardone Township	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.19. 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.20. 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.21. FISH HATCHERIES UNDER DOF (2016-2017)

Unit - Million

No.	Fish Hatcheries	Location	Production
	Yangon Region		**164.758**
1.	Hlaw Kar	Mingalardone Township	80.368
2.	Twante	Twante Township	43.887
3.	Laydaukkan	Dagon(east) Township	40.503
	Bago Region		**74.613**
4.	Bago (Kali)	Bago Township	38.061
5.	Thanappin	Thanappin Township	18.930
6.	Oakpho	Oakpho Township	17.622
	Mandalay Region		**181.209**
7.	Pathein Gyi	Pathein Gyi Township	77.195
8.	Myit Thar	Myit Thar Township	74.754
9.	Natyekan	A-ma-ya-pu-ya Township	-
10.	Matayar	Ma-ta-yar Township	29.260
	Nay Pyi Taw		**57.287**
11.	Pyinmanar	Pyin-ma-nar Township	57.287
	Ayeyarwady Region		**106.128**
12.	Pathein	Pathein Township	19.202
13.	Talotehla	Ma-u-bin Township	20.285
14.	Hinthada	Hin-tha-da Township	16.179
15.	Pantanaw	Pan-ta-naw Township	25.998
16.	Aung hate	Ma-u-bin Township	24.464
	Magway Region		**9.391**
17.	Taungdwingyi	Taungdwingyi Township	4.361
18.	Pwint Phyu	Pwint Phyu Township	5.030
	Kachin State		**11.706**
19.	Waing-maw	Waing-maw Township	5.702
20.	Bamaw	Bamaw Township	6.004
	Sagaing Region		**27.188**
21.	Shwe Bo	Shwe Bo Township	7.914
22.	Yay Oo	Yay Oo Township	10.912
23.	Htee chaint	Htee chaint Township	8.362
	Mon State		**4.168**
24.	Thahtone	Thahtone Township	4.168
	Shan State		**4.236**
25.	Nyaung Shwe	Nyaung Shwe Township	4.236
	Kayin State		**3.408**
26.	Pha aan	Pha aan Township	3.408

Table.22. FISH HATCHERIES UNDER DOF (2017-2018)

Unit - Million

No.	Fish Hatcheries	Location	Production
	Yangon Region		**161.884**
1.	Hlaw Kar	Mingalardone Township	79.822
2.	Twante	Twante Township	41.080
3.	Laydaukkan	Dagon(east) Township	40.982
	Bago Region		**74.317**
4.	Bago (Kali)	Bago Township	32.360
5.	Thanappin	Thanappin Township	27.191
6.	Oakpho	Oakpho Township	14.766
	Mandalay Region		**179.668**
7.	Pathein Gyi	Pathein Gyi Township	70.454
8.	Myit Thar	Myit Thar Township	71.098
9.	Natyekan	A-ma-ya-pu-ya Township	10.086
10.	Matayar	Ma-ta-yar Township	28.030
	Nay Pyi Taw		**57.566**
11.	Pyinmanar	Pyin-ma-nar Township	57.566
	Ayeyarwady Region		**90.519**
12.	Pathein	Pathein Township	14.805
13.	Talotehla	Ma-u-bin Township	20.500
14.	Hinthada	Hin-tha-da Township	14.220
15.	Pantanaw	Pan-ta-naw Township	29.277
16.	Aung hate	Ma-u-bin Township	11.717
	Magway Region		**11.433**
17.	Taungdwingyi	Taungdwingyi Township	4.660
18.	Pwint Phyu	Pwint Phyu Township	6.773
	Kachin State		**12.517**
19.	Waing-maw	Waing-maw Township	5.656
20.	Bamaw	Bamaw Township	6.756
21.	PutaO	PutaO Township	0.105
	Sagaing Region		**30.987**
22.	Shwe Bo	Shwe Bo Township	8.241
23.	Yay Oo	Yay Oo Township	10.550
24.	Htee chaint	Htee chaint Township	12.196
	Mon State		**4.291**
25.	Thahtone	Thahtone Township	4.291
	Shan State		**4.584**
26.	Nyaung Shwe	Nyaung Shwe Township	4.584
	Kayin State		**3.402**
27.	Pha aan	Pha aan Township	3.402

Table.23. SHRIMP/PRAWN HATCHERIES UNDER DOF (2012-2013 to 2017-2018)

Unit - Million

No.	Shrimp/Prawn Hatcheries / Shrimp (Penaeus monodon)	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
1.	Wa-maw (Long-lone)	1.50	0.50	1.70	-	-	1.530
2.	Kyauk-phyu	1.00	1.50	2.50	2.00	2.500	3.500
3.	Ye-chan-pyin	3.00	1.50	-	2.27	-	1.000
4.	A-lae-tan-kyaw	-	-	-	-	-	-
5.	Soe-me-kyi	-	-	-	-	-	0.100
6.	Chaung Tha (Sein Ngwe Mya) Prawn (Macrobrachium rosenbergii)	2.00	-	-	1.20	0.099	-
7.	Kyauk-tan	-	-	0.30	0.60	2.940	1.136
	Total	**7.50**	**3.50**	**4.50**	**6.07**	**5.539**	**7.266**

Table.24. 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**