

COUNTRY PAPER OF MYANMAR

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■ INTRODUCTION

Small-scale fisheries contribute over 95% to the total national catch. All fishing activities, with the exception of operation carried out by D.O.F. (Myanmar Fisheries Enterprise) are referred to small-scale fishing activities. This report is primarily concerned with marine fisheries, particularly, with the traditional small-scale coastal fisheries. However, frequent references are made to other sectors of fisheries, such as freshwater fisheries and off-shore fisheries in order to put the small-scale sector in a proper perspective.

Fish is an important of the daily protein in take (80%) of the population about (51 million) of Myanmar. The main role of fisheries in Myanmar is provider of food as well as employment. Average annual production for the last 5 years amounts to 763, 720 m .t. In which marine fisheries accounts for 529, 320 m .t (78%) per capita consumption of fish is 18.5 kg (1993-94). The freshwater fisheries provide 22% of the total catch. The consumer preference is still for freshwater fish which causes the high price of this commodity, on the other hand, the marine fish is available at much lower price, it is steadily growing.

Small-scale marine fisheries have great potential for further developments. In spite of having a considerable levels of increased production from small-scale sectors, investments have been mainly, directed towards the development of industrial fisheries and aquaculture. Even then, investment if these two sectors have not attained a significant increases in the levels of production.

The low productivity of small-scale fisheries in Myanmar is attributed to the use of primitive fishing gears and methods. Priority should be given in the development of boat design, construction, fishing gear and methods. Other factors, associated with the low productivity of his sector is shortage of fishing gears and equipments such as net, rope, twine, engine spear part and fuel. Myanmar still lacks manufacture of fishing equipments within the country, mainly relying on imports. With the manufacture of fishing materials and equipments locally, if sufficiently supply cheaper and higher grade of materials and availabel to fishermen, production could be boost substantially in small-scale castors.

Export product amounted to 96, 740 m .t with the value of US\$ 120.6 million was realized during 1994-95. It has upward trend of exporting. The prospect of small-scale fisheries development in Myanmar is certainly bright since the resource potential is available and a huge market waiting on the doorstep because of the big gap between demand and supply of fish in the international markets.

■ STRUCTURE OF FISHERY MANAGEMENT SYSTEM

Ministry of Livestock and Fisheries took the responsibilities for the development of fisheries in Myanmar. There are three Department, one Enterprise and one Beekeeping Division. Two Departments are directly concerned with fisheries. They are Directorate of Livestock and Fisheries Department, and Department of Fisheries.

The Directorate of Livestock and Fisheries is directly responsible to the Minister and co-ordinates, supervises, monitors and evaluates the manual performance of the department and enterprise. This Department also gives advises on formulation of projects and foreign economic relation. Department of Fisheries is responsible for the management of fisheries, conservation of resources, providing extension service, conduction research, and compilation of the national statistics in fisheries.

As the population is booming day by day the exploitation of aquatic resources is naturally getting inters as well. Moreover current high export demand for shrimp prawns and certain species of fish is major course of pressure leading to over investment in fisheries.

In the future the demand for fish will exceed potential supplies creating over exploitation subject to this, effective appropriate management measures are required to promote the objective for optimum utilization of aquatic resources.

Management should be conceived and understood not as a constraint upon national exploitation, but as an essential tool for the sound, sustained development of fisheries. Hence, management of fisheries is an integral part of the development process. There is a need to introduce effective management mechanisms at all stages and particularly at the beginning of fisheries development rather than wait until the effect of over fishing have begun to be felt.

The setting of that objective should be based on assessment of the fishery resources available, existing technology, market to be served, social and economic conditions, the potential impact of other economic activities, and other relevant factors, including foreign operation, where applicable. The objective, it appears, is to provide a legislative framework for a fisheries management system, and to ensure, as far as possible, that both the fishery people and responsible authority concerned perform their roles within that frame work. Thus new impetus has come a new and broader view of the role of law in fisheries management of all renewable natural aquatic resources.

The economy of the Union of Myanmar, under centrally plenned economic system in the part, has been changed into a market-oriented system since 1988. The Government had envisaged such policy objective as exploitation of abundant resources of the country with a view to catering to the needs of the national in the first instance and exporting whatever surplus available. Furthermore the extension of Myanmar Jurisdiction to 200 nautical miles according to UN Convention on Law of the Sea also present a new and unprecedented opportunity to reap the full benefit of the living aquatic resources. At the same time attention has been drawn to the potential roles of inland water fisheries and aquaculture as food supplies within the overall socioeconomic context of national development

In this respect a reassessment of strategies and policies for fisheries development and management from time to time need to take full account of the present and potential contribution from marine fisheries as well as from inland water fisheries and aquaculture.

In order to fulfill the need, the DOF, playing major roles in fishery management, is conducting acquisition and analyzing of information implementation of fishery policy and design and exercising of management measure and the continuous evaluation of management activities.

Obviously, the DOF always conduct the management and conservation of aquatic resources, licensing, surveillance and enforcement of existing fisheries law as its main responsibilities. To render assistance and to support the effort exerted by DOF on fishery management the government has promulgated four fisheries laws, namely.

The law Relating to the Fishing Rights of Foreign Fishing Vessel, Myanmar Marine Fisheries Law, Freshwater Fisheries Law Relating to Aquaculture.

■ FISHERIES RESOURCES

Myanmar has a long coastline that stretches approximately from 21° N to 10° N over a distance of 1,800 km. With its large number of estuaries and islands, a total coastline will be close to 3,000 km. The continental shelf (0-200) depth covers an area of 225,000 km²

Since the total investments in the marine fisheries sectors were considerable, it was felt that at least the rough estimate of marine fisheries resources should be obtained, so that the risk of over investment and consequent financial failure could be avoided.

With a view to identification of new fishing grounds, stock and efficient means of their exploitation "Marine Fisheries Resources Survey and Exploratory Fishing Project" was carried out with the assistance of F.A.O during 1979-83. Project activities consisted of acoustic/experimental fishing surveys with R.V. Dr. Fridtjof Nansen and trawl surveys with a vessel from Myanmar contribution.

The coast line of Myanmar has been divided into 3 sub-areas to represent main ecological division.

1. The Rakhine (Arakan) coast : Bordering with Bangladesh in the north, a narrow shelf areas, a few islets down to 16.00 Lat. N. (Maw din point)

2. The Ayeyarwady (Irrawaddy) 16.00 Lat. N (Maw din point) area : shelf area between 16.00 and 13.30 'Lat. N Dawei (Tavoy point)

3. The Tanintharyi (Tenasserim) coast : From 13 .30" Lat. To 10 .00' Lat. N, Kawthanung (Victoria point) border with Thailand. This division has been initiated during acoustic surveys

Later, trawl survey also has followed the same division

Estimate of small pelagic fish such as sardine (Nga kone nyo), shub mackerel (platu) and herring (zin bya) has been recorded a standing stock of about one million m.t, out of which about half a million m.t was considered a yearly maximum sustainable yield (M.S.Y.). It was found that biomass (standing stock) at pre-monsoon was about twice as high as during post-monsoon season.

Demersal fish resource (Trawling surveys)

The four appraisal surveys of demersal fish resources were conducted off the Myanmar continental shelf during 1981-83. The results of these trawl surveys are furnished below.

Regarding demersal fish resource, namely, snapper (Nga Parr Ni), thread fin/ Indian salmon (ka ku yan) and croaker (poke thin) their standing stock was about 800,000 m .t from these about 550,000 m .t was exploitable as maximum sustainable yield (M.S.Y). Thus, a total of about 1.05 million m .t could be harvested as yearly (m .s .y) for the whole shelf areas.

Shrimp resources

The most extensive shrimp surveys were conducted with the assistance of O.D.A (U.K) off the Rakhine coastal in 1981-82. An annual standing stock of 4,370 m .t of shrimp was estimated in the surveys area of 14,700 km³

Although shrimp surveys were also conducted off the Ayeyarwady and Tanintharyi with FAO in 1981-82, the standing stock could not be calculated due to inadequate trawls hauls. Considering Myanmar sea conditions, yield per unit area, an assumption has been made and estimated a standing stock of 4,000 m.t for Ayeyarwady and 5,000 m.t for Tanintharyi, totaling 13,000 m.t of shrimps for all regions.

Hilsa resource

Hilsa is very important pelagic fish resource, contributing to the national economy by small-scale fishermen. It is distributed widely entire coast of Myanmar as well as in the inland waters. The fish takes anadromous migration through the river system, particularly, Ayeyarwady river complex for spawning.

Two species of hilsa are observed namely, in *Tenualosa toil* is common and *Tenualosa ilisha* is mostly contributed in Ayeyarwady and Rakhine areas.

Fishing season off the delta is from September to March, with two peak seasons namely, August and September. The most effective fishing gear for this species is encircling gill nets.

Bombay duck resource

Dried fish is favorite item in the daily diet of Myanmar people. There is a kind of fish, exclusively exploit for making dried fish, called Bombay duck (*Harpodon nehereus*). According to the record from the previous surveys, conducted in the year of 1980, it was known that the estimated standing stock of this single species was 42,000 m.t

Reef fisheries resources

Reef fishery is usually associated with rocky or coralline areas in which nature of topography restricted the use of trawls or drift nets.

Common reef fishes occurring in Myanmar reef waters are snapper, group, sea bream, large size horse mackerel, oyster, sea cucumber, jellyfish, spiny lobster and sea urchin. Standing stock of reef fishery is not known however, there are very good habitat all along the coast.

Crab resource

Crab resource is another potential of Myanmar. Although Myanmar people are not very much prefer crab than fish in old days,

crab resources are now become important item in fish trade, because of newly open market economic policy, which was laid down by the Myanmar government in last ten year. The two main species are mud crab (*Scylla serrata*) and sand crab (*Portunus pelagicus*). The main habitat areas for mud crab are mangrove forest in the coastal areas. The crabs are mainly caught by bamboo traps with bait in a depth range of 1 to 3 meters near the mangrove forest. The resource is believed to be substantial.

■ FISHING GEARS

The fishing methods in small scale fisheries comprised of "fixed engine" (i.e. trap and basket) lift nets, stake nets and cast nets in the on-shore fisheries, gill nets, drift nets, small shore-seines, set nets, hooks and cast net in the in-shore fisheries sector. The fishing in the small-scale fisheries have mainly, based on passive fishing techniques, fish being caught by luring or by chance. The most important and active fishing gear is encircling gill nets used for exploiting Hilsa species.

The small-scale fisheries sectors have succeeded to some extent to increasing production due to mechanization of the craft and introduction of synthetic imported fishing nets.

Encircling gill net for hilsa

This fishing gear is only use to exploit hilsa species. The fishing season for hilsa species in the Tanintharyi coastal areas is round about July and in the in-shore grounds off the Ayeyarwady is from September to March with two peak seasons of rivering spawning migration, August and October.

Large type drife gill net for hilsa

Season for fishing by this fishing gear is from September, October to April, May. Even in off-season about 25% of fishing vessels go out for fishing. These nets operate not only for Hilsa but also for Spanish mackerel and pomfret.

Small gill net for miscellaneous fish

Major species caught by small type of drift net are silver pomfret, Spanish mackerel, thread fin or India salmon, herring, cat fish, horse mackerel, pike conger, rays and sharks. From August to April are the fishing seasons for these gears with the best season in September to November.

Trammel gill net for shrimp

This type of fishing is targeting exclusively for the shrimp in the in-shore fishing grounds. Fishing season is from June to November with the peak seasons August and September; it is associated with shoaling habit of the white shrimp in the rainy season. Since the price of shrimp is higher than fish, the trammel gill net is very popular among the small-scale fishermen and they use to operate throughout the year.

Bottom gill net

This type of fishing is operated in the mid water and at the bottom to catch shark, large size mackerel and thread fin, large size sea bass. This type of fishing gear is very popular around Ayeyarwady delta areas and Northern Tanintharyi areas.

River gill net

This type of fishing gear is popular along the river areas, catching hilsa, croaker and mango fish.

Tiger mouth net (Kyarr pa zat)

There are two types of tiger mouth nets. The small tiger mouth is 45' long with the mouth width of 18'. While in large tiger mouth is 75' long and 21' wide. Small type operate in the rivers and the large types operate in the in-shore area usually (4) miles away from near shore.

Main season of tiger mouth net is from August to April and the best season is October to December. Major fishing areas are off the

Ayeyarwady delta and around Myeik archipelago. Species caught by tiger mouth nets consists of small pomfret, ribbon fish and a good quantity of juvenile shrimp and fish.

A good catch of one operation of larger mouth net has yield about 1.5 mt.

Long line fishing

Many fishermen have taken up to long line fishing since the cost of fishing gear is relatively low. It is also very popular along the whole coastal areas of Myanmar.

Fishing season is from October (End of Buddhist lent period) to February. Species caught by this fishing method mainly consist of Indian salmon or threadfin (Ka Ku yan), large croaker (Ka tha Myin), catfish (nga yaung) conger eel (nga shwe) and shark (nga mann) Average catch is 10-30 kg per operation.

■ MANAGEMENT MEASURES

One of the goals of fisheries management is to achieve sustainable coastal fisheries. In order to achieve this goal, various management strategies have been formulated and implemented to control fishing effort and promote rehabilitation and conservation of marine resources and marine ecosystems. These measures include:

- State and Division-wise direct limitation of fishing effort through proper licensing of the fishing gear and fishing vessels. A person desiring to carry out inshore fishery shall apply for license to the Officer-in charge of the Department of the respective Township in the prescribed application form. The effectiveness of the fisheries licensing procedure is 1st April to 31st March of next year

- Nursery areas are identified and they have been protected and managed as reserved fishing areas to ensure survival of juveniles of commercially important fish species. These areas have been gazette as closed fishing area for three months (June to August). These are one fishing ground in Rakhine, four fishing grounds in Ayeyarwady, two fishing grounds in the Mon, and three fishing grounds in Tanintharyi region.

- Strict law enforcement on fishing activities in Myanmar's fishery waters, is carried out by a number of department's, namely Myanmar Navy, Myanmar Coast guard, Department of fisheries, Customs Department, and Myanmar Police Force, and these department address the problem of illegal fishing.

- Rehabilitation of resources through the use of artificial reefs and coral replanting program; have not yet been established in Myanmar Coastal zones. Although the condition of the Myanmar coastal zones are still intact and not yet threatened as to establish an artificial reef, the authorities of the Department of the Fisheries has determined to apply artificial reefs in specific area for the conservation and rehabilitation of resources.

Closed are

To conserve the juveniles fish and shrimp to avoid conflate between the artisanal fishermen and the trawler, Rakhine coast five mile from the shore line, For Ayeyarwady and Taninthayi coast ten miles from shore line. The trawler will not allowed to fishing in those areas.

Closed Season

June, July and August, the three months are closed season. That season most of the juveniles come back to the mangrove area (feeding ground). The fishing boats must stop fishing operation.

Limitation of Mesh Size and License System

As the major portion of marine product came from artisanal fishermen, it is important to fulfill needs of small scale and indigenous fishermen by increasing the income, improving their lives and those of their families, as well as their environment. Accordingly, this zoning of fishing is entirely based on policy of protecting our local fisheries. Under these circumstances the Department of Fisheries gives first priority to local fishermen by permitting them to operate

in all aonce. In addition to this and as declared in the Territorial Sea and Maritime Zone Law the waters between the baseline and the coast are reserved entirely for local fishermen.

The rapid increases in demand for quality marine products significantly accelerated momentum on shrimp and other demersal resources exploitation, resulting in resource use conflict and violence between trawlers and small-scale fishermen. To ensure a more equitable exploitation and distribution of resources and to support the sustainability of small scale artisanal fisheries, efforts have been made by DOF by limiting the size and engine power of fishing boats in inshore areas. For effective management and control the DOF also determines the type of fishery, volume of business method of fishing, species of fish permitted to exploit, size of fish, fishing implement and fishing ground and these condition are attached to all fishing license.

Minimum mesh size and minimum catch able size for main economic fish species have been established based on Rule of expansion and protection of fishery resources. For instance, the mesh size on fish trawl codends is not allowed smaller than 2.5 inches and 2 inches for the shrimp trawl codends. The large mesh drift net, the minimum mesh size shall be 8 inches and for small mesh drift net are 3.5 inches mesh size.

Prohibition of fishing gear

Under "Law Relating to The Fishing Rights of Foreign Fishing Vessels" and "Myanmar Marine Fisheries Law" and related regulations, fishing gear that is destructive to the environment and the fisheries resources are banned. These gears includes pair trawl fishing, electric fishing, fishing using poisons, chemicals and explosives, push net, Purse seine net less than 1 inch mesh size, for trawl net cod-end mesh size less than 2 inches, trammel gill net for less than 1.5 inches mesh size etc.

■ CONSERVATION OF RESOURCES

Conservation of marine resources has always been the primary concern of the Department. Marine Park and Marine Reserves as well as fisheries protected area have been established under Fisheries Laws, as one of the Department's management measures. This is essential to protect, conserve and manage in perpetuity the marine environment in order that it remains undamaged for future generation. Public awareness of the need to protect the corals and other marine flora and fauna in the waters surrounding the islands off the coast is being promoted to ensure their conservation. Recently, Lampi island of Tanintharyi coast have been gazetted as Marine park and Marine Reserve. The waters around the island area also have been announced as fisheries protected areas, whereby collection of marine fauna and flora is prohibited. Fishing in fisheries protected areas is prohibited unless specifically licensed to do so.

■ REQUIREMENT FOR DEVELOPMENT OF FISHERIES

1. Assess the potential of marine and coastal living resources including under-utilized and unutilized stock and species; develop methodologies and take measures for their conservation and sustainable use; and undertake studies on maximum sustainable yields of different fish species.

2. Encourage research and develop long-term monitoring programmes database and information sharing with international conservation communities for technical and logistic support.

3. Develop and implement strategies for the sustainable use of marine living resources, taking into account the special needs and interests of small-scale artisanal fishermen, local community and indigenous people to meet nutritional and other development needs, integrate small-scale fisheries development in marine and coastal planning taking into account their interest and, where appropriate, encourage representation

of fishermen, small-scale fish workers, women, local communities and indigenous people.

For fisheries development augment the national effort to support fisheries development in the country, we need assistance from international fisheries related agencies such as FAO, NACA, BOBP and SEAFDEC. Apart from the government's in fisheries development, International or regional collaboration is needed in the following areas;

- a. assessment of fishery resources
- b. development of appropriate technology.
- c. training of skilled manpower
- d. identification and preparation of projects
- e. financing of commercial operation

Region	Surface area Covered mk ²	Standing stock		Average Standing stock	M.S.Y. m .t
		Pre-monsoon	Post-monsoon		
Rakhine	39,000	170,000	180,000	175,000	87,500
Ayeyawady	118,000	640,000	370,000	505,000	252,500
Tanintharyi	72,000	520,000	70,000	295,000	147,500
Total	229,000	1,330,000	620,000	975,000	487,500

Fig. 1 Pelagic fish resources (Acoustic surveys) Acoustic estimate of total standing stock and M.S.Y on the Myanmar shelf area 1979-80

Region	Depth range (m)	Surface area (km ²)	Standing stock		Average Standing	M.S.Y m.t
			Pre-monsoon	Post-monsoon		
Rakhine Coast	0-50	20,130	103,200	240,100	171,650	121,195
"	51-100	14,000	14,000	97,100	55,550	39,222
"	101-200	38,700	38,700	36,600	37,650	26,583
Sub total		72,830	155,900	373,800	264,850	187,000
Ayeyawady	0-50	60,891	276,900	168,700	222,800	158,170
"	51-100	28,592	37,700	61,000	49,350	35,037
"	101,200	15,884	16,500	12,500	14,500	10,293
Sub total		105,367	331,100	242,200	286,650	203,500
Tanintharyi	0-50	31,723	155,600	113,700	134,650	92,036
"	51-100	35,732	97,900	76,200	7,050	59,501
"	101-200	17,246	14,100	9,200	11,650	7,963
Sub total		84,701	267,600	199,100	233,350	159,500
Grand total		262,898	754,600	815,100	784,850	550,000

Fig. 2 The results of trawl surveys were conducted off the Myanmar continental shelf