



Fishery and Socioeconomic Status of Sharks and Rays in Mon State, Southern Myanmar

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ABSTRACT

The study was conducted on the processing and production of sharks and rays and the fisheries and socioeconomic status of Mon State such as Zeephyuthaung, Setse, Kyaikkhami, Sebalar and Ahlayt fishing villages during 2018-2019 fiscal years. There were 1240 fishing boats for inshore fishing and 320 fishing boats for offshore fishing in Mon State and the four main types of fishing gears for sharks and rays namely longlines, gill net, bagnet and purse seine. Shark and ray were the high production in Setse and Kyaikkhami. The productions of processing plants were produced 11912.371 metric tons of fish and 23.561 metric tons of shrimps in Mon State. Mawlamyine Holding Processing Plant and Panda Processing Plant was produced fish and shrimp's product only but not shrimps another plants. Among them, Thanlwin Aye Processing Plant of Ye was the most fish production (4515.611 MT) and the least production (266.21 MT) was Linn Yaung Ni Processing Plant of Mawlamyine. At Zeephyuthaung Station, it was found that about 24.5% of the landing fish is marketed fresh, 30% of transported as fresh fish with ice and marketed, 27.5% of is sun-dried, 7% of for making fish-paste and fish-sauce and 11% is cold-storage processed for export. Shark and ray were also utilized for fresh, fins, skins and dry products in study areas. Sharks and rays are suspected to constitute a sizeable of the shark meat trade, while rays are often overlooked in the fin trade. The traditional fishing boats, both motorized and non-motorized were used in the study areas.

1. Introduction

Fish and fisheries products are one of the most important sources of export earnings. In Myanmar, the fishery sector is the second most commercially vital sector after the agriculture sector to fulfill the protein requirements of the people of Myanmar to provide the food security as well as employment opportunity to a large number of fishery communities and rural dwellers. The total fish stocks of Myanmar are about 1.75 million tons of which 1.05 million tones can be harvested annually (Howard, Ahmad and U Saw Han Shein, 2015). Along the Myanmar coastline, there are 139 fishing grounds. Among them, Mon State has 14 fishing grounds.

Fishery is the oldest and most important livelihood option for the inhabitants of the coastal line of the country since times immemorial. This natural resource along with the marine environment has been the custodian of livelihood security of

the coastal populace (Nieves et al., 2009). The marine resources potential source can be bracketed under two categories i.e. oceanic fishery and coastal fishery. Sharks and rays are versatile fisheries resources, providing meat and shark fins for human consumption, leather, shark liver oil used to produce lubricants, cosmetics and vitamin A, live specimens for aquaria and shark teeth and jaws sold as tourist curios (Fowler et al., 2005; Fowler, 2014).

In Myanmar, shark and ray's fisheries are mainly artisanal fisheries; it is exploited by the fishermen and the incidental caught by the other fisheries. Sharks are captured by gill net and sometimes hooks and line. Rays are mainly harvested by hooks and line but sometimes by the set bag net and trammel net. The most valuable shark fins and few dried meats are exported to the different Asian countries. Sharks catches are incidental catches to other fisheries in Myanmar. Till now, there is no comprehensive report on the landing of sharks and



rays in Myanmar. In the study area, the fish is an essential part of the diet and the main role of the fishery sector. No study on socioeconomic assessment of sharks and rays has been conducted yet. The aim of the present study is to provide an overview of landing trends and percentage contribution in shark and ray fisheries producing and exporting from an economic and social point of view and to assess the socioeconomic status of sharks and rays along the Mon coastal areas included Ahlayt, Sebalar, Kyaikkhami, Setse and Zeephyuthaung.

2. Materials and Methods

The main five fish landing sites situated at Mon coastal areas such as Zeephyuthaung, Setse, Kyaikkhami, Sebalar and Ahlayt fishing villages were selected for fishery data

collection and interview face-to-face talk on fishermen and local people (Fig. 1). The field visit was undertaken for a year during 2018. Relevant data was obtained from a random sample of 50 household respondents which interviewed 10 households in each station of Mon coastal areas.

For observation of fishery status, Zeephyuthaung and Ahlayt fishing villages were focused. The respondents and participants included fishing boat owners, fish vendors, local village officials, youth and fishermen. Interviews contained the question on a day fishing activity, time and duration of fishing trip, characteristics of fishing method, catch size and composition, consumption and sale of fish etc. Secondary data sources were also obtained from relevant reports, published and unpublished literature and records.

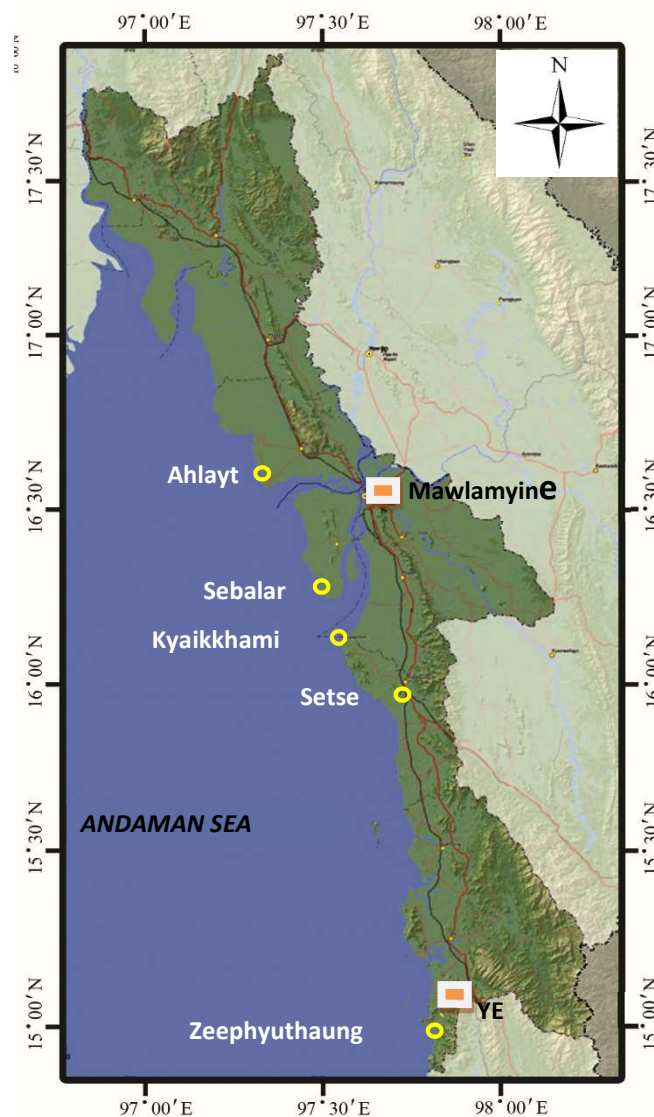


Fig. 1. Map showing the study areas of Mon coastal areas

3. Results and Discussion

3.1. Fishing Areas and Fishing Gears

Sharks and ray’s fisheries constitute inshore and offshore fisheries. Inshore fishing was operated in near shore along the coastal waters and around islands while offshore fishing was in

various fishing grounds of offshore waters. Fishing is carried out throughout the year except severe weather condition and fishing closed season. There are four main types of fishing gears namely longlines (Nga-myar-tann), gill net (Hlwar-shin-myaw-pike), bagnet (Kyar-pa-zat) and purse seine (Wine-pike) (Swe, 2011).

3.2. Population and Household Size

Based on the obtained data from interviewing the fisheries and socioeconomic status of the study area are assessed. The number of household and its average size were also given. The assessment revealed that men were higher proportion (50.7%) than women population (49.3%) at Zeephyuthaung and Sebalar Villages while the remaining villages had higher percentage of women. In addition, the total population percentage was 40% of men and 60% of women at Kyaikkhami (Sinhphone). Among these villages, total population was also the largest (9764) at Ahlayt Villages. Sebalar possessed the lowest population (1267) according to the data record of Administration Offices from each village.

Fishery households were two-fold to three-fold greater than the other workers at all the sampling villages although the average household members were not markedly different ranging from 3.8 to 6.1. Concerning age group lived in the study areas; it was recorded to be higher in middle age group (19 to 65 year-old).

3.3. Fishing Assets

Table 1 and Fig. 2 showed the status of fishing boats in Mon State during 2018. There were 1240 fishing boats for inshore fishing and 320 fishing boats for offshore fishing in Mon State. The three townships of Ye, Thanphyuzayat and Chaungsone have the offshore fisheries and not another township. The most abundant fishing boats were 584 boats in Ye Township and the least was 66 boats in Beelin Township.

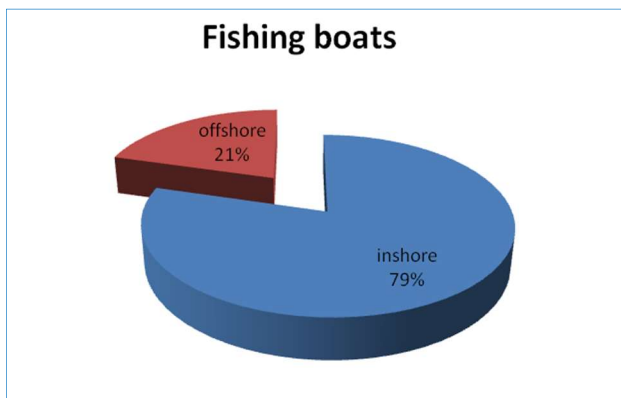


Fig. 2. Inshore and offshore fishing boats in Mon State

Table 1. Inshore and offshore fishing boats in Mon State

No	Township	Fishing boats	
		Inshore	Inshore
1.	Ye	387	197
2.	Thanphyuzayat	356	116
3.	Chaungsone	135	7
4.	Paung	146	-
5.	Thaton	82	-
6.	Kyaikhto	68	-
7.	Beelin	66	-
Total		1240	320

Table 2 presented fishing gears, target species groups with the respective fishing area and fishing season. Of the fishing gear utilized, bagnet (Kyar-pa-zat) was mainly used in coastal

estuarine the year-round. There are four main types of fishing gears for sharks and rays namely longlines (Nga-myar-tann), gill net (Hlwar-shin-myaw-pike), bagnet (Kyar-pa-zat) and purse seine (Wine-pike).

3.4. Distribution of Fishery Products and Economics

There were the fishery products and the target distributed place (local, domestic and export) at different stations. Although fresh fish were locally consumed, the dried products were distributed to local and domestic. Cold-freeze products from Kyaikkhami and Zeephyuthaung stations were extensively sent to Yangon as well as export (China, Thailand and Malaysia). Depending on the fish groups, landing price and market price noticeably differed. Market price was three or two fold higher than the landing price. The giant catfish and the giant perch were the highest prices (12000 kyats/viss) in other fishes at the market.

3.5. Utilization of Major Group

In the study area a variety of fishery resources are produced in different forms such as fresh, fresh with ice, freezing products, dried and smoke-fish, fish paste and sauce. There is no caning and fish meal industry in Mon State. Sun drying products were produced mainly from Indo-Pacific king mackerel, large scale tongue sole, spadenose shark and ray with 80% of total products. The giant catfish, Bombay duck and cadal shrimp were dried for 60%, 50% and 50% respectively of total products. The fresh of Hilsa shad, silver pomfret, soldier catfish, giant perch, crab and mantis shrimp were used for 70%, 60%, 60%, 60% and 60% respectively of total products. The fresh with ice of fish total product was distributed to the market for 70% of Hilsa shad, 20% of silver pomfret, soldier catfish, sea mullet and 60% of crab in the study area. For cold freeze for export, the fish groups such as Indian threadfin, giant threadfin, Reeve's croaker, giant perch, tiger shrimp and lobster were utilized (Table 3).

3.6. Infrastructure Related to Fishery

Among five fishing villages, Ahlayt appeared to possess better facilities for fishery compared to the remaining fishing villages. There are two fish landing site jetty and four chilled and cold storages in Ahlayt only. There is no fish meal factory in the study area. Ahlayt was followed by Zeephyuthaung in which wealthy condition of fisher who also works on other jobs was observed.

3.7. Production of Fishery Resources

Table 4 described that Production of fish and shrimp processing plants in Mon State during 2018-2019 Fiscal year. Depending on the fish group, landing price and market price noticeably differed. Market price was three or two fold higher than the landing site. There were 11912.371 metric tons of fish and 23.561 metric tons of shrimps in the processing plants of Mon State. Mawlamyine Holding Processing Plant and Panda Processing Plant were produced fish and shrimp's product only but not shrimps another plants. Among them, Thanlwin Aye Processing Plant of Ye was the most fish production (4515.611 MT) and the least production (266.21 MT) was Linn Yaung Ni Processing Plant of Mawlamyine.

Fig. 3 and Table 5 exhibited the percentage catches of major fish group in the study area during 2018. There are 9 groups

of fishes namely mackerel, threadfin, catfish, mullet, anchovies, Bombay duck, sharks and rays, shrimp and others concerned, Bombay duck was of the highest production in Setse, Kyaikkhami and Sebalar. Shark and ray were the high production in Setse and Kyaikkhami. In each station, high production of fishery resources more or less varied. Particularly at Zeephyuthaung station, mackerel, catfish and mullet appeared to be the highest catch, at Ahlayt station, mullet appeared to be the highest catch. Shrimp was the high production in Sebalar station. Bombay duck, anchovy, croaker, threadfin and shrimps were largely utilized such as fresh, dried forms, fish paste and fish sauce compared to other fishery resources. Shark and ray were also utilized for fresh, fins, skins and dry products in study areas.

All of the processing and production methods studied in the present work are traditional and very old. The processing is extremely simple and required only simple equipments. The processing can be carried out even during the rainy season. In fact, in many countries all over the world, fish curing and drying become declining (Roy et al., 2013). Preference for wet fish effective use of ice and chilling techniques, growing nutritional awareness and vast improvement in transport facilities have all contributed to this phenomenon. However, sun-drying method is still continued to be used worldwide.

There are vast differences in the method of production of cured fish such as drying, smoking, sorting, chilling, etc. from countries to countries and from places to places. The traditional but improved methods are preserved in post-harvest technology.

Globally, many shark and ray species are currently traded at levels that far exceed what can be sustainably sourced. The greatest quantity by weight of shark product traded is in the form of shark meat while shark fins are the most valuable (Arshad et al., 2017). Analysis of FAO data for the world's top 20 shark trading countries highlights that Singapore was the world's second-largest importer and exporter of shark fins in value terms, after Hong Kong, for both time periods of 2005 to 2007 and 2012 to 2013 (2422 tons) (Boon, 2017). In the present study, the price of fresh of sharks and rays are 8000 kyats per viss (1 viss = 1.6 kg) and the dry products are 20000 kyats per viss (1 US\$ = 1500 kyats, unofficial local rates). It is very popular fish price in Mon State.

Even though many major shark fishers have introduced conservation measures and also joined the international fight against illegal, unreported and unregulated (IUU) fishing, there has been overall slowness in implementing the IPOA for Sharks (Ahmad et al. 2018). For proper management and conservation of shark and ray fisheries there is need for a National Action Plan. In Myanmar, National Plan of Action (NPOAs) for Sharks is already prepared in National Level by Department of Fisheries, Ministry of Livestock, Fisheries and Irrigation.

As socioeconomic concerns, it was recorded that among the studied fishing villages, the most population was Ahlayt and the least population was Sebalar. The households were directly or indirectly connected to fishery sectors. Ahlayt was the largest community connected to fishery sector. However,

Ahlayt and Zeephyuthaung more fishing boats. The distribution of fish and fish products in the study area revealed that in Zeephyuthaung and Kyaikkhami, the distribution of fish product (cold freeze) are not only for local and domestic but also for export abroad such as China, Malaysia and Thailand. From the aspect of socioeconomics in fishing community, it could be generally suggested that the literacy rate was medium to high level condition. High school were established in Zeephyuthaung, Setse and Ahlayt fishing village. Dispensary and maternity were present in all fishing villages.

The utilization of fish products depends on the infrastructure. The four chilled and cold storages facilities at Ahlayt gave utilized percentage to certain extent for freeze forms. These ice factories make exported fish and fish product to Yangon. There are no caning and fish meal factory in Mon State. At Zeephyuthaung station, it was found that about 24.5% of the landing fish is marketed fresh, 30% of transported as fresh fish with ice and marketed, 27.5% of is sun-dried, 7% of for making fish-paste and fish-sauce and 11% is cold-storage processed for export.

Fishery resources is an important part of the diet in the study area and the main role of the fisheries sector has been as a provider of food chiefly for locals. Some major fish groups are of noticeably economic valued for production of various forms such as fresh, frozen and dried. On the baseline data worked out for biological aspect of some commercial species and assessment of production rate, it was submitted that public awareness must be concerned for sustainable development of fishery resources along the Mon coastline.

4. Conclusion

In Mon State, the infrastructure condition level is medium and socioeconomic condition level is increased during the last decade, the bulk of the marine and estuaries catch were still landed by non-motorized craft. There are still needs to bring about the improvement in the standard of living. As an estuarine nature with a variety of fish species, the water resources in the study area are ideally suited to exploitation by artisanal fishermen using small scale fishing crafts and traditionally gear. However, it will be efficient and the most effective for distribution and marketing if the infrastructure and service facilities become improving in near future. With a view to improving the socioeconomic status of fishing community, major group of the study area should build their economy through efficient resource utilization. The present baseline data obtained in the study area will provide the informative requirements to certain extent for the users, researchers and stakeholders in relation to fishery sector.

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