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Socio-economic status and livelihood assessment in artisanal fisher folk around Mein Ma Hla Island, Bogale Township, Pyapon District, Ayeyawady Region, Myanmar

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Abstract

Socio-economy and livelihood assessment of artisanal fisher folks from a hundred and sixty-one people twenty-three villages around Mein Ma Hla Wildlife sanctuary was systematically researched totally seven months, from July 2016 to January 2016. Finfish fisheries, shellfish fisheries, eel trapping and fish buyers were recorded as main businesses. In their demographic status, 78% of local communities were male and the left 22% were female in fisheries processing. As well, 31% of 25-35 years old group among the residents were chronicled as the largest age distribution group and the average age distribution group was in the middle of 41-42 years old. At the literacy level, 37% in primary school level utmost and only 8% in high school level was verified. Besides that, the highest income group was fish buyers between 20,000 MMK-58,000MMK and the least income group was eel trapping between 2,000MMK-6,000MMK. 27% of inhabitant fisher groups employ bagnets at most and 1% in man push net at least were observed. It was noted that 70% of fishing boat have no engine. The measurements of fishing boats were commonly 6ft×1.5ft×1ft without engine. Depend on the fishing season, the amount of catchment per day was 20 tickles-20 viz.

Keywords: Daily income, demographic status, livelihood assessment, main businesses, socio-economy

Introduction

Fishery sector plays one of the most important roles in Myanmar having a vast potential for fish resources, from both inland and marine environments. The republic of the union Myanmar occupies a long coastline approximately 2832 km and it also consists of three distinct parts, the western Rakhine coast, the southern Ayeyawady deltaic coast, and the north-south Taninthayi strip. In the process of being long coastline, fishery production in Myanmar increased from 4,478.21 thousand MT in 2012 to 5,047.53 thousand MT in 2014. In 2016, total national fish production upgraded to 4,645,020 metric tons. Likewise, the fishery sector in Myanmar provides employment to 3.2 million people (800,000 full-time and 2.4-million-part time). (Fisheries statistics, 2018) The fisheries sector employs around these amount of people in Myanmar's most impoverished areas and provides an essential food source for many more. (Khaing *et al.* 2018) ^[22].

Along the Myanmar Coastline, there are 140 fishing grounds on these three main coasts. Among them, Ayeyawady region occupies the most fishing grounds (44 fishing grounds). Ayeyawady division is one of the most populous of Myanmar's states and divisions, occupying the delta region of the Ayeyawaddy River. Fishery is also important sector in Ayeyawady Region which has the most numerous fishing grounds and also produces fish, prawn, fish-paste, dry fish, dry prawn and fish sauce. Moreover, around 1.9 million households are located in the coastal zones of Myanmar and dependent on marine and coastal resources (BOBLME 2014). For that reason, socio-economic data for these fisheries communities are a key component of the scientific advice required for the evidence-based management of fisheries, yet in many countries these data are limited, usually because of a lack of technical capacity for their collection. Pinello *et al.* 2017

In 2018, the Ayeyawady region was the most affected region by cyclone Nagis including the study area, Mein Ma Hla Island.

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The devastation effect of the super cyclone Nagis was still felt even after a decade. The majority of the people are poor, too extremely poor. (https://wikitravel.org/en/Meinmahla_kyun.) Owing to the fact that all villages are fishing and/ or farming ones we categorized three main occupations, namely, fishing, farming and odd jobbing, locally known as “bouk”. Some people work as fishermen assistants rarely permanently and some also works as crab/eel trappers occasionally if they can possess a few traps (paing). Common fishing gears such as bag nets, beach surrounding nets, drift nets, portable cast nets, man push nets, long line nets, set gill nets and trammel nets are mostly used in artisanal fishery of surrounding waters of Mein Ma Hla Island area. (Khin Myo Myo Tint *et al.* 2015) ^[13] Local residents from these areas have to rely almost totally on the biodiversity of the area, for instance, fish, prawn and crab as food or for their livelihoods and mangrove trees as fuel wood and construction materials. Consequently, the aim of the study was to describe the various types of living conditions of local societies who are working in different kinds of fisheries around the study area, Mein Ma Hla Island, Ayeyawady Region of Myanmar.

Materials and Methods

Description of Study area

Totally, twenty-three villages surrounding Mein Ma Hla Island (Mein-ma-hla Kyun Wildlife Sancturay (MKWS)) located in Bogale Township, Pyapon District, Ayeyawady Region of Myanmar were designated as study sites for this survey. List of study sites is systematically described as Table (1).

Selection target communities

A hundred and sixty-one people of local fishing communities who were drawing in fishing permanently and partially fishermen in the studied areas were mainly interviewed by visiting the major fishing communities encountered in the study sites.

Questionnaires survey

To gather diverse types of their demographic information, different tools (surveys, discussions, and interviews including physical observations) were used. The survey was taken approximately 15-25 minutes to complete, depending on the details given by the respondent. The opened directed interviews with the descriptive multi-level approach in field-work in order to cover a wide range of angles on the common research goal were conducted. some draft, simple questionnaires were prepared and noted as semi-structure sentences to collect: 1) Demographic information on the fishers, 2) Type of fishery he/she is involved in, 3) Equipment characteristics and 4) Spatial information on fishing practices.

Sources of Data

Getting hold of data could be divided as two types of data

source; primary data source and secondary data source. Primary data was amassed over and done with field survey from bouk (the basic level) up fish buyers to village leaders by using both well structural questionnaires and semi structural questionnaires. Doing survey and collecting Data were carried out together by physical observation and interview with fishermen at house, field, fishing places and market. Related to secondary data on socio-economic condition of fishermen were collected from local and international books, thesis, research papers, journals, Government and non-Government organizations suchlike Department of Forestry (Bogale), Flora and Fauna International (FFI), University Central Library (UCL), etc.

Data Analysis

All of the data came by field surveys were taken account of classification of jobs according to their livelihoods, cataloging their daily incomes, noting their fishing implementations and interpreting some numeric data and some narrative facts. Entirely accumulating the data was conducted based on the training course of fieldwork in social coastal ecology by Dr. Sarah Keene Meltzoff (Professor, Department of Marine Ecology and Society Rosenstiel School of Marine & Atmospheric Science, University of Miami,) and Research Assistant Roxane de Waegh. After analyzing data, interpreting, editing, summarizing and description with graphical representations were prepared.

Table 1: List of twenty-three study sites around Mein Ma Hla Island, Bogale Township, Pyapon District, Ayeyawady Region, Myanmar

Station No. (St.)	Village Name	Location
1.	Pyin Boe Gyi	16° 4'52.66"N, 95°21'25.99"E
2.	Kant Ma La Chaung	16° 3'44.40"N, 95°21'51.03"E
3.	Aung Chan Thar 1	16° 3'28.92"N, 95°21'57.87"E
4.	Sein Ya Ti	16° 0'36.17"N, 95°21'41.79"E
5.	A Si Gyi	16° 0'6.31"N, 95°21'42.29"E
6.	A Si Lay	15°59'59.56"N, 95°21'39.01"E
7.	Htaw Paing	15°57'5.94"N, 95°21'25.12"E
8.	Kone Tan Pauk	15°56'14.45"N, 95°20'45.59"E
9.	Yway Chaung	15°55'1.47"N, 95°19'50.51"E
10.	Da Min Naung	15°54'47.20"N, 95°19'28.50"E
11.	Kwin Thar Yar	15°53'52.54"N, 95°18'23.05"E
12.	Ka Don Ka Ni	15°48'59.22"N, 95°12'44.76"E
13.	Chaung Byal Gyi	15°53'13.73"N, 95°12'39.93"E
14.	Kan Seik	15°53'33.47"N, 95°13'22.04"E
15.	Mee Laung Kwin	15°54'37.62"N, 95°13'40.62"E
16.	Gway Chaung Gyi	15°56'4.58"N, 95°13'44.96"E
17.	Ma Pwe Tan	15°56'43.33"N, 95°14'18.88"E
18.	Kone Tan Pauk	15°57'47.32"N, 95°14'1.55"E
19.	A Pyin Ma Yan	15°58'37.21"N, 95°15'22.45"E
20.	Nga Poak Tin Tan	15°59'15.40"N, 95°15'45.68"E
21.	Pa Dae Gaw	16° 0'34.57"N, 95°15'50.00"E
22.	A Pyin Boak Chaung	16° 1'41.25"N, 95°15'48.40"E
23.	La Wine	16° 2'52.24"N, 95°16'46.03"E

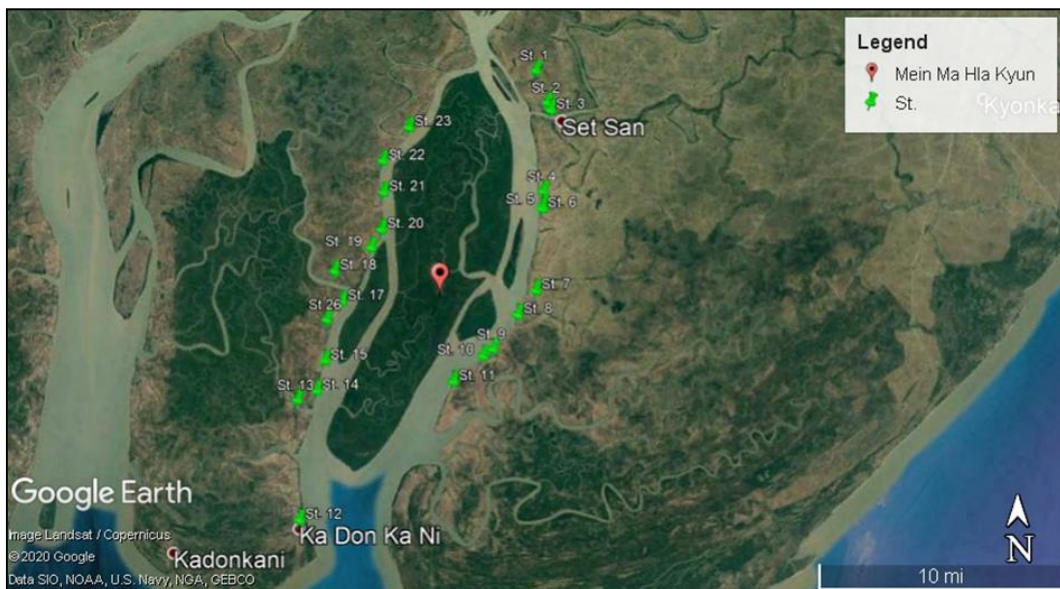


Fig 1: Map Showing study site around Mein Ma Hla Island (Source: Google Earth)

(i) Types of jobs in fishing communities of study sites around MKWS

There were documented as five main businesses in local fisheries sector around MKWS which were using their traditional artisanal fishing gears and techniques: 1) Eel trapping, 2) Crab trapping, 3) Prawn trapping, 4) finfish fishing and 5) fish buyers. (Fig 2) Most of the fishermen carry out both catching various kinds of fish and also prawn depends on the fishing season. Moreover, some works as general workers (Bouk or Kuli in local term); working in fishing, working in farming, working in crab trapping and either. Commonly, 32% of local populations are finfish fishermen, 23% are crab trapper, 29% of them are prawn fishing, 11% among them are eel trapper which is used for crab bait and the least population of them are fish buyers.

(ii) Gender Status

Among a hundred and sixty-one interviewees, there were

recorded 78% of men who were operating in various kinds of fisheries and 22% of women were working together with their husbands or some were involved in marketing and processing of fish products in the fisheries sector of study areas. (Fig. 3) Surveying the socio-economic conditions of the majority of hilsa fishing households in the Ayeyawady Region, actual female participation in fishing act% and male participation was up to 74%. (Khing *et al.* 2018) [22] In Chittagong district of Bangladesh, among the fishermen of which 47 (94%) were male and 3 (6%) female in fisheries. (Hossain, 2014) [8] The role of women in fisheries sector, they take part more traditional roles as fish processors in post-harvest production. (Sunderarajan *et al.* 2001 cited by Williams *et al.* 2002) [23] Generally, most of women from study area do not directly contribute in fishing activities but they indirectly take part in these like by preparing and repairing of nets and act as a supply chain of fishes to market.

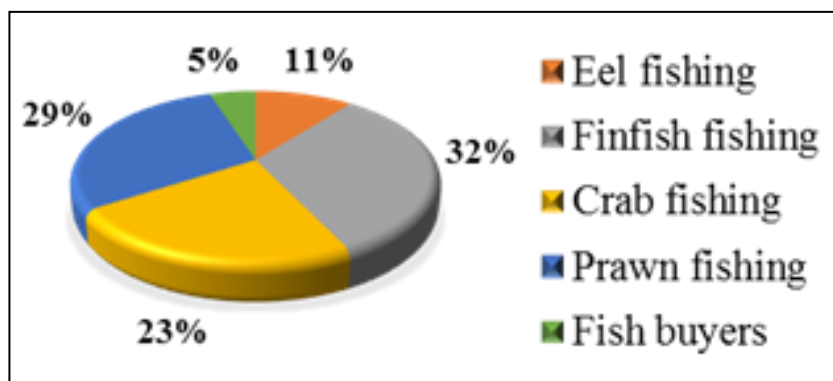


Fig 2: Types of jobs in fishing communities around MKWS.

(ii) Age Structural Profile

In a total of a hundred and sixty-one interviewees from twenty-three study sites around MKWS, there were documented as the highest percentage of age distribution group is 31% of 25-35 years old group, the second largest one is 24% within 35-45 years old group, 17% in 45-55 years old group, 13% of 55-65 years old group, 6% in 65-75 years old and 9% of 15-25 years old group. (Fig 4.) In Jaffana, the highest age group was 36-45 years old group (Ragavan *et al.*

2016) [20] while the maximum percentage of fisheries communities in Oman was 32.74% in 21-30 years old group (Manaa Saif Alhabasi *et al.* 2012) [14]. The youngest age of local communities from the study area who worked in fisheries industries was 16 years old and the oldest age of them was 70 years old. Commonly, the average of age group of fishermen is between 41-42 years old (exactly 41.256 years old).

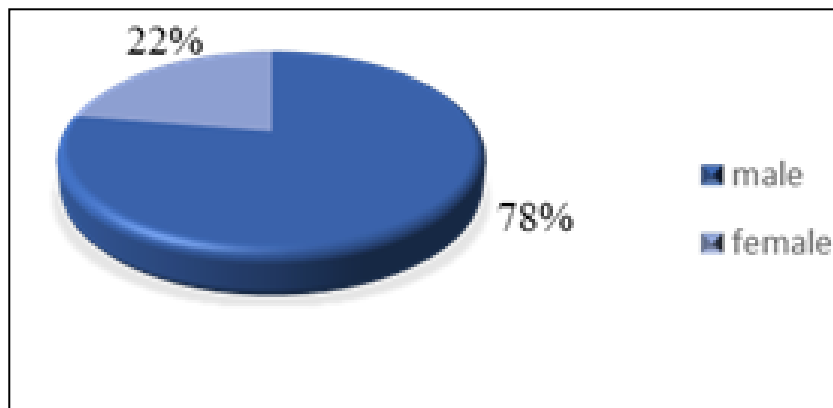


Fig 3: Gender status of fishermen around MKWS.

(ii) Age Structural Profile

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Similarly, percentage of population in the educational status of fishers among the Southeast Asian countries were at least in 1985. (Panayotou *et al.* 1985) [18] In Oman, most of the fishermen were uneducated in 30.69% due to the difficulties about their incomes. (Manaa Saif Alhabsi *et al.* 2012) [14] Likewise, 70% of local fishermen in Chittagong region of Bangladesh were illiterate and about 14% of them, very less number of fisheries communities was literate. (Hossain *et al.* 2014) [8] Generally, the literacy standing rate of fishing communities are lower than the other communities.

(iii) Literacy Rank

As a result, the educational status of local fishermen communities was well-defined as 37% of them are B.E.P.S level, 26% are Ba Ka level, 15% are B.E.M.S level, only 8% are B.E.H.S level and 14% of them are no education. (Fig 5.) In comparison with the average literacy rate of country, the educational conditions in fishermen are inferior than others.

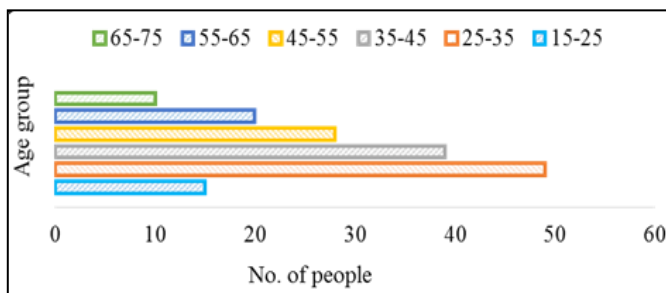


Fig 4: Age distribution group of local people from the study sites around MKWS.

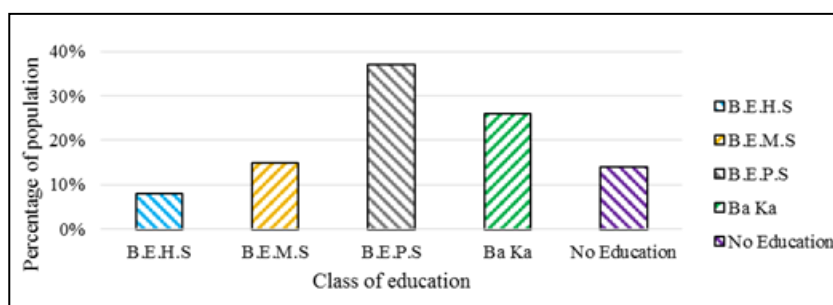


Fig 5: Percentage on literacy rank of local fishing communities around MKWS.

(iv) Daily revenues level

The daily income ranks of those fisheries communities were different by depending on the type of their livelihoods they were working in. (Table 2) (Fig 6.) Depends on the seasonal conditions, their daily catch rate of each livelihood is quite diverse. In average of their daily profits between minimum and maximum income range of local fisheries communities, there were noted down as from 4,000 MMK to 39,000 MMK hinge on the employments and also the standard deviation between their proceeds per diem was detailed from ±2828.427125 to ±40870.77195 rest on their occupations. In the Hilsa fishing of Ayeyawady Delta, the mean hilsa fishing

income to be MMK8,000 per day was estimated. (Khaing *et al.* 2018) [22] In scrutinizing out the percentage of their daily income, fish buyers earn the highest income who possess 39% among the fisheries communities, the second is finfish fishing group keeping 31% of them, shellfish fishermen are the third group occupying 15% in prawn fisheries and 11% in crab trapping groups and the last fisher groups who are standing the lowest income level among the fisheries communities around MKWS is eel trappers: 4% of them. The fisheries populations in South and Southeast Asia countries are still the poorest communities with the lowest income. (Paul *et al.* 2018) [1].

Table 2: Daily income level of each fishing communities from the study sites around MKWS. (MMK)

Kinds of fishing	Min	Max	Average	Standard Deviation
Eel fishing	2,000	6,000	4,000	±2828.427125
Finfish fishing	2,200	60,000	31,100	±40870.77195
Crab fishing	2,500	19,000	10,750	±11667.26189
Prawn fishing	6,000	25,000	15,500	±13435.02884
Fish buyer	20,000	58,000	39,000	±26870.05769

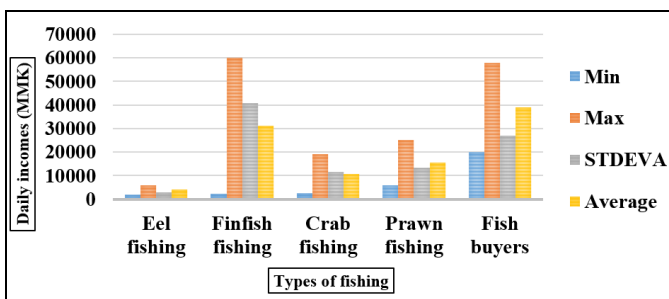


Fig 6: Profits per diem of each fishing communities from the study sites around MKWS. (MMK)

(v) Types of fishing net used by local fisheries populations

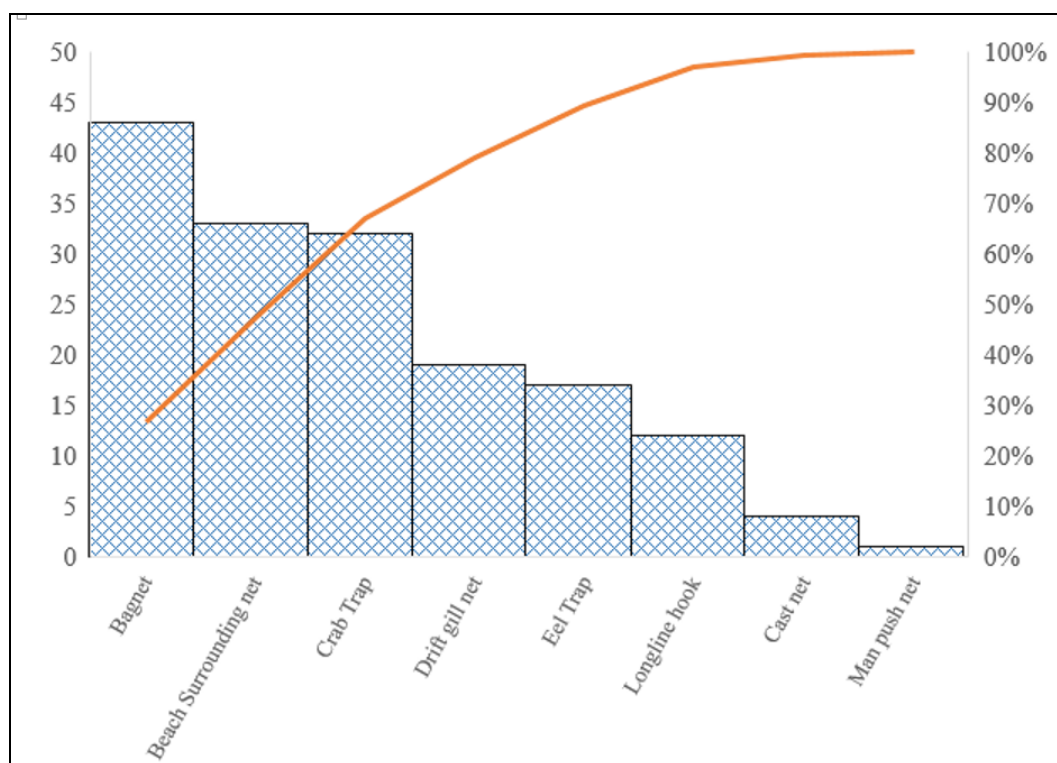


Fig 7: Types of fishing net used by local fisheries populations around MKWS.

(vi) Measurements and engine power of fishing boats from the study areas

Various measurements of fishing boats and engine power used by local fisher folks were documented in detail. (Fig 8.) Usually, the lengths of their crafts are 6ft×1.5ft×1ft (Length × Width × Height) without engine and they use paddling by themselves. But some fishermen utilize the longer the lengths of their fishing boats, the more engine power they used. The majority of fishing local people especially crab trappers and

around MKWS: Different kinds of fishing nets were found in the study sites around MKWS. (Fig 7) The majority of the fishermen in those areas are used Bagnet fishing nets to catch various kinds of fish which is about 27% and the mesh size is 3 cm at widest and 0.5 cm at narrowest. And the second commonly fishing instruments are beach surrounding nets and crab trapping which are employed in their artisanal fishery production possessing about 20% individually. In the crab fishery, there are two types of crab traps, in term Paing, which is made up of bamboo and iron. They use some baits just like salted eel and some mangrove fruits to trap the crabs. Specially to catch herring species such as Hilsa shad and Toli shad and some Crocker species, they use gill nets including set gill nets and drift gill nets which have about 12% in their fishery sector. Another fishery porting the local communities with low investment is eel trapping which is applied for baits in crab trapping. Besides Long line hook fishing method holding 7% of local fishing methods are employed to catch some fish species such as sea perch, some Crocker species, etc. Likewise, man push net fishery and cast net fishery possess a few percentages of their traditional artisanal fishery at the study sites around MKWS.

eel trappers use the small fishing boats without engine and the minority of local fishermen have the different length of fishing with different engine power having from 4 Hp to 7 Hp suchlike at the study sites. (Hp- Horse power) Most of their fishing boats are made up of hard woods alike teak and timber but some construct with mangrove trees. Depends on the kinds of wood and the length of it, the cost of fishing boats is changed from 1,000,000 MMK to more than that.

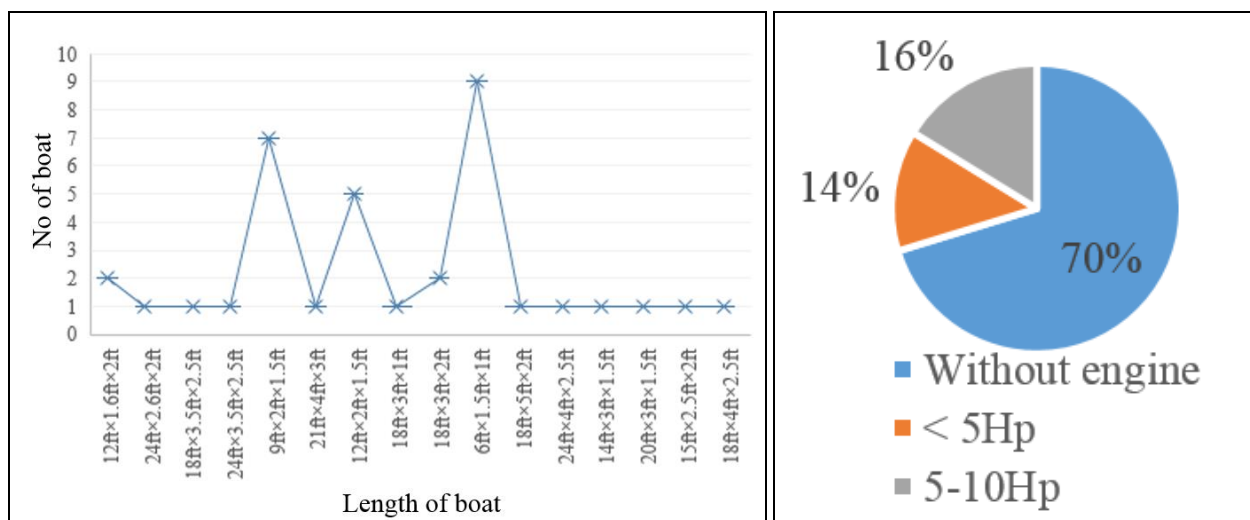


Fig 8: Measurements and engine power of fishing boats from the study areas.

(vii) Religion, nationality and phonology between resident fisheries societies in the study areas

The greater part of local fisheries communities revere Buddha, so 88% of resident people around MKWS are Buddhism and the rest part of them believe on Baptist Christian and it is about only 12%. Furthermore, 18% of inhabitant among the fisheries households are Kayin nationality and 82% are Myanmar nationality. These Kayin nationalities use both Burmese dialect and their original linguistic, Kayin.

(viii) Species compositions and catch per unit effort

During the survey period, it was distinguished that fresh condition and dried condition, both of them are being beneficial in these marketplaces. Commonly called, crockers, herrings, Chinese pomfret, Jarbua Terepon fishes and flatfishes supports as both export and local economic, essential fish species. The occurrence on the number of fish species around MKWS was distinctly high between mid-May to mid-Oct. (Khin Myo Myo Tint *et al.* 2020) [12] Related to the catch per unit effort (CPUE) from the study sites can be indirectly measured the abundance of a target species. Depend on the fishing season, the rate of catch per unit effort (per day/unit effort or boat) of the local fishing members were recorded between 20 tickles to 20 *viz.* During the survey period, it was found that 85% of the fishermen borrowed money from fish buyers, in turn, prepaid system is using by fish buyers to local fishermen for purchasing fishing nets and boats.

Summary and Conclusion

By considering back, some local people are well-defined as

general workers, bouk in local name for the reason that they do alternation their livelihoods depend on the fishing period. The gender participation in fisheries sector are not equal ratio in theoretical but in real-world, there is an imperative inter-relationship between men and women in natural resources management. Besides, it was recognized that the literacy rank of these residents stands at B.E.P.S level and so, they can read and write Myanmar literature although there are not the same nationalities and different language usage. Moreover, there can be found a large gap about their daily earnings between grass-root level of fisheries sector, in turn fishermen and middle class level, in turn fish buyers. Likewise, their fishing production requisite so much input powers like financial investment for fishing boats, nets, expensive fees for fishing gear license, storage for their products, etc. By means of a consequence, they cannot be able to escape from poverty cycle. After it has been over a decade by affecting the cyclone Nagis in 2008, government and some international non-governmental organization cooperated to help in recovering of capacity-building, income generating opportunities and other support services. Nevertheless, socio-economic profile of artisanal fisher folks from the study sites around Mein Ma Hla Island Wildlife Sanctuary are still poor by reason of lacking of awareness as well as the poor income. Therefore, local fishers' livelihood can be enhanced through helping more to progress their social life and economic condition.

Acknowledgement

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Table 3: List of Acronyms (Burmese-English)

MKWS-Mein Ma Hla Kyun Wildlife Sanctuary	B.E.P.S-Basic Education Primary School
Kyun-Island	B.E.M.S-Basic Education Middle School
MT-Metric ton	B.E.H.S-Basic Education High School
DOF-Department of Fishery	Ba Ka-Monetry Education
Bouk/Kuli-General worker	MMK-Myanmar Kyats (Myanmar Currency)
Paing-Trap	Pike-Fishing net
St.-station	Bawin pike-Beach Surrounding net
Tickle (16.3293 g)-Burmese Measuring Unit	<i>viz</i> (1.63293 kg)- Burmese Measuring Unit

References

1. Alok Kumar Paul, Shapon Kumar Bashak, Mohammad

Shahanul Islam and M. Afzal Hussain. Comparatve socio-economic study with a review on fisherman's

- livelihood around Tsuiganga river, Jaypurhat, Bangladesh. *Journal of Fisheries and Aquatic Science*. 2018; 13:29-38.
2. Bhuyan S, Islam S. Present Status of Socio-economic Conditions of the Fishing Community of the Meghna River Adjacent to Narsingdi District, Bangladesh. *Journal of Entomology and Zoology Studies*. 2016; 4:192.
 3. De Waegh, Roxane S., "Developing Human Capacity for Marine Scientific Research in Myanmar" (2015). Open Access Theses. 586. Master of Science. University of Miami. https://scholarlyrepository.miami.edu/oa_theses/586.
 4. Emerton Lucy. Assessing, demonstrating and capturing the economic value of marine & coastal ecosystem services in the Bay of Bengal Large Marine Ecosystem BOBLME-2014-Socioec-02. 2014.
 5. Formulation and Operationalization of National Action Plan for Poverty Alleviation and Rural Development through Agriculture (NAPA) National Action Plan for Agriculture (NAPA) Working Paper 4: Fisheries and Aquaculture Small-scale fisheries and aquaculture capture, production and management. MYANMAR: Yangon, 2016.
 6. Gaurab Jyoti Kalita, Pradip Kumar Sarma, Priyanuz Goswami, Srustidhar Rout. Socio-economic status of fishermen and different fishing gear used in Beki River, Barpeta, Assam. *Journal of Entomology and Zoology Studies*. 2015; 3 (1):193-198.
 7. Hanif MS, Iqbal KJ, Javid A, Khan N, Irfan Majeed H, Altaf M *et al.* Socio economic status of fishermen community, South Punjab, Pakistan. *Punjab University. Journal of Zoology*. 2019; 34(2):115-118.
 8. Hossain S, Hasan MT, Alam MT, Mazumder SK. Socio-economic condition of the fishermen in Jelepara under Pahartoli of Chittagong district. *Journal of Sylhet Agriculture University*. 2014; 1(1):65-72.
 9. <https://opendevelopmentmyanmar.net/topics/fishing-fisheries-and-aquaculture/>
 10. https://wikitravel.org/en/Meinmahla_kyun.
 11. <https://www.worldfishcenter.org/country-pages/myanmar>
 12. Khin Myo Myo Tint. A study on ichthyofauna of ka-byar-wa coastal waters, ye township, mon state. Unpublished M.Sc. Thesis. Department of Marine Science, University of Mawlamyine, 2015.
 13. Khin Myo Myo Tint, Swe Thwin, Tint Swe, San Tha Tun, Thura Htun. Preliminary investigation on the occurrence of some estuarine Ichthyofauna around Mein Ma Hla Island, Bogale Township, Pyapon District, Ayeyawady Region, Myanmar. *International Journal of Fisheries and Aquatic Studies*. 2020; 8(2):241-248.
 14. Manaa Saif Alhabsi. The fisheries community of Albatinah Region in Oman: A socio-economic overview. *Journal of Fisheries Sciences*. 2012; 6(3):215-223.
 15. Melti Roza Adry, Dewi Zaini Putri. Socio-Economic Status of Fishermen's Household in West Sumatra Province. *Advances in Economics, Business and Management Research*. 64:227-238.
 16. Mridula Rani Das, Sunuram Ray, Uttam Kumar, Salma Begum and Satya Ranjan Tarafdar. Livelihood assessment of the fishermen community in the South West Region of Bangladesh. *Journal of Experimental Biology and Agricultural Sciences*. 2015; 3(4):353-361.
 17. Myanmar Fisheries Statistics. Department of Fisheries, Myanmar, 2018.
 18. Panayotou T. Small-scale fisheries in Asia: socioeconomic analysis and policy. Ottawa, Ont., IDRC, 1985, 283.
 19. Pinello D, Gee J, Dimech M. Handbook for fisheries socio-economic sample survey – principles and practice. FAO Fisheries and Aquaculture Technical Paper No. 613. Rome, FAO, 2017.
 20. Ragavan N, Sivashanthini K, Sutharshiny S. Socio-economic status of fishers in Allaipiddy village, Jaffna. *Journal of Science*, 2016, 12.
 21. Sanchai Tandavanitj. Assessing the Socio-Economic Conditions of Small-Scale Fisheries: Experience of Thailand in Implementing Development Projects. Southeast Asian Fisheries Development Center. 2008; 6:3.
 22. Wae Win Khaing, Michael Akester, Eugenia Merayo Garcia, Annabelle Bladon, Essam Yassin Mohammed. Socioeconomic characteristics of hilsa fishers in the Ayeyarwady Delta, Myanmar: Opportunities and challenges. IIED, London, 2018.
 23. Williams MJ, Chao NH, Choo PS, Matics K, Nandeesh MC, Shariff M *et al.* Global Symposium on Women in Fisheries: Sixth Asian Fisheries Forum, 29 Nov 2001, Kaohsiung Taiwan, 2002, 209.