

Socioeconomic Status of Fishermen in Moe-byae Reservoir Pekhon Township, Southern Shan State

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Abstract

Occurrence of fish species in Moe-byae reservoir, Pekhon Township was conducted from June 2019 till December 2019. During the study period a total of 28 fish species distributed among 21 genera, 13 families and five orders of fishes belong to the class Osteichthyes was identified and recorded from the study sites within Moe-byae reservoir. The socioeconomic and livelihood status of fishing community from Moe-byae reservoir was studied in terms of age, sex marital status, household size, educational level, fishermen' experience, number of fishing gears used and monthly income from selling fish. Most of the age group of fishermen was 31-40 years (40%), majority of fishermen were 90% male and 10% female, 80% married respondents, fishing experience 11-15 years (45%), 65% of family has 4-6 members, educational status was middle school level (45%), used fishing gear was gill net (50 %) and Pike-saung (30 %), and the monthly income was 260,000-300,000 kyats (50%).

Keywords: Moe-byae reservoir, socioeconomic status, livelihood, fishing experience, monthly income

Introduction

Fishes are economically important for people consumption and livelihood of fishermen. Human livelihoods especially in many developing countries depend on aquatic resources mainly fish. Fish are valuable sources of high-grade protein and other organic compounds. The fishing industry is not only income generation livelihood but also food security for the mankind. (Nwe Nwe Oo, 2013)

Inland fisheries in Myanmar play an important role in food security and socioeconomic status of the people especially in rural areas and also in daily diet of the locals who traditionally prefer to consume fresh water fishes together with rice (Murray and Little, 2000).

Fisheries sector plays an important role on socioeconomic development of fishermen community. Moe-byae reservoir has an extensive inland water area system and water bodies which possess varying potential for development of inland and aquaculture subsectors.

Socioeconomic status (SES) refers to information on a variety of aspects of a community, such as demography, income, living cost, boat transport, fishing gear, marking infrastructure etc. and provides information for understanding of social, cultural and economic conditions of people, household and community (Parashar *et al.*, 2016).

Livelihood can be defined as the capabilities, the assets (natural, physical, human, financial and social capital), the activities and the accesses to these (mediated by institutions and social relations), that together determine the living gained by the individual household (Chambers and Conway, 1992). Livelihood support can have various meanings, ranging from livelihood provision, to protection, recovery and promotion (Maxwell, 1999).

The survey of the area basically brings out the information on the salient demographic details of the fishing families, the income from fishing and other sources and pattern of fishing adopted in the area. Also, attention is given on aspects like role of women, status of fishing

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activates, gear used, attitude towards fish resource conservation, migration undertaken by fishermen etc. (Parashar *et al.*, 2016).

The socioeconomic status of fishermen depends on the Moe-byae reservoir as their livelihood over the years economic condition of fishermen had further deteriorated. Besides, the reservoir is very popular habitat for research on the aquatic life and their ecosystem. Moe-byae reservoir was constructed in Moe-byae town, Pekhon Township, Southern Shan State, to collect the water flowing from Balu Chaung. Since the water is very clear and transparent, enhancement of aquatic vegetation is very good for the shelter of aquatic animals especially fishes. The present research was conducted on the socioeconomic life of fishermen who depend on this reservoir because there is no information and record from this point of view. Therefore, the present study aimed to determine the socioeconomic status of fishermen.

Materials and Methods

Study Area and Sites

This study was conducted in Moe-byae reservoir, Pekhon Township. Within Moe-byae reservoir three study sites were selected. Samples were collected from Lwe Paw (Site I), Lwe Pan Sone (Site II) and Pekhon (Site III). (Fig. 1)

Study Period

The study period was from June 2019 to December 2019.

Fishing Gears Used

Fishes were monthly collected by fishermen who used gill nets and legal fishing gears such as cast-net (kun), Pike-saung, hook and line, and bamboo trap.

Questionnaire Survey

Fishermen were asked several questions to know their socioeconomic status such as age, family size, educational status (illiterate, primary, secondary and so on), sources of income (professional, occasional, subsistence), occupational status (Fishing, Agriculture, Day Labor), annual income, housing condition, net used.

Results

In the present study, 28 species, 21 genera, 13 families under five orders of fishes belong to class Osteichthyes were observed from three study sites of Moe-byae reservoir, Pekhon Township during the study period.

As the aim of this study the socioeconomic status of fishermen, especially, emphasis was given on such variable namely age, sex, marital status, household size, educational level, fishermen' experience, number of fishing gears used and monthly income from selling of fish were recorded. The age of the fishermen varied from less than 19 year old (10%), 20-30 (15%), 31-40 (40%), 41-50 (30%), more than 50 year old (5%) age group. Majority of fishermen are 90% male and 10% female. Twenty percent were single fisherman and 80% are married respondents. Household type also determined of as 20% family has only 1-3 members, 65% family has only 4-6 members and 15% family 7-10 members. As educational status, it was found that 35% fishermen was dropout at primary school level, 45% middle school level and 20% had high school level, graduate level did not observed in fishermen. According to fishing experience, 25% fishermen experienced above 20 years, 10% had 16-20 years, 45% had 11-15 years, 15% had 6-10 years and 5% had 1-5 years. Nearly half of fishermen were most experienced in fishing in the Moe-byae reservoir. The most used fishing gear was gill net (50

%) followed by Pike-saung (30 %). Monthly income (260000-300000 kyats) was gained by fishermen (50 %), 210000-250000 and 160000-200000 kyats by 20 %, and 100000-150000 kyats by 10 % respectively. (Table 1)

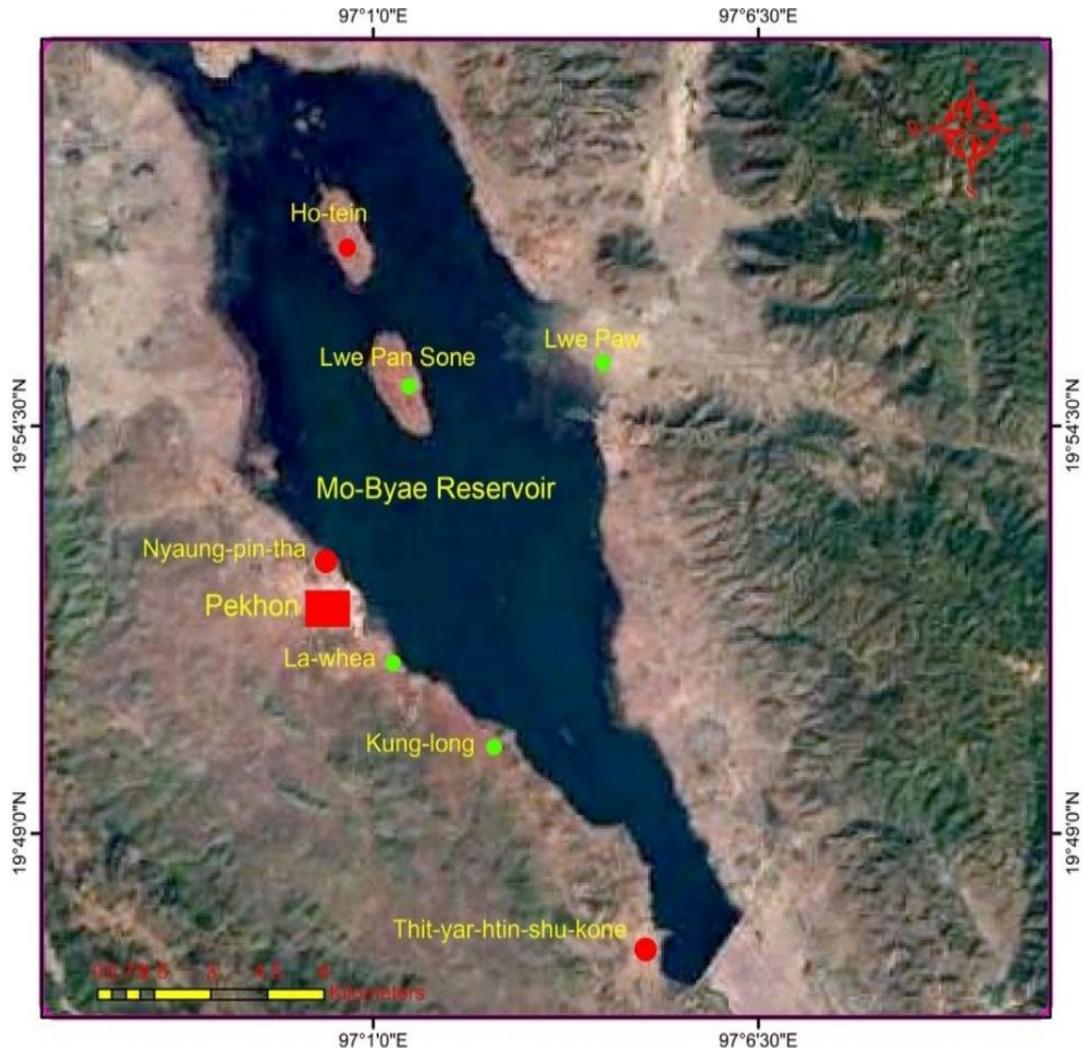


Fig. 1 Map Showing the study sites in Moe-byae reservoir

Depend on the growth and maturity the fishes were divided into two size groups such as large size group and small size group. There were 17 species in large size group and 11 species in small size group (Table 2). The local people prefer raw fish of large *Cyprinus intha* than preserved ones. And the Sawbwa was eaten as dried because a few numbers was collected in catching. Most of the local people prefer raw fish as 26 species, smoked fish as seven species, dried fish as 16 specie and salted fish as seven species. (Table 3)

Table 1 Response of fishermen to questionnaire on the study area

Parameters	frequency	Percentage
Age of respondents		
Less than 19	8	10
20-30	12	15
31-40	32	40

41-50	24	30
More than 50	4	5
Total	80	100
Sex of respondent		
Male	72	90
female	8	10
Total	80	100
Marital status of respondents		
Single	16	20
Married	64	80
Total	80	100
Household size (person)		
	Frequency	Percentage
1-3	16	20
4-6	52	65
7-10	12	15
Total	80	100
Education level		
Primary	28	35
Middle	36	45
High	16	20
Graduate	-	-
Total	80	100
Fishermen experience (Year)		
1-5	4	5
6-10	12	15
11-15	36	45
16-20	8	10
above 20	20	25
Total	80	100
Type of used fishing gears		
	Frequency	Percentage
Hook and Line	8	10
gill net	40	50
Pike-saung	24	30
Eel trap	8	10
Total	80	100
Monthly income from sales of fish		
100000-150000 kyats	8	10
160000-200000 kyats	16	20
210000-250000 kyats	16	20

260000-300000 kyats	40	50
Total	80	100

Table 2 Categories of fishes in Moe-byae reservoir

Collected fish species	Large Size	Small Size
<i>Notopterus notopterus</i>	+	-
<i>Esomus metallicus</i>	-	+
<i>Devario auropurpureus</i>	-	+
<i>Ctenopharyngodon idellus</i>	+	-
<i>Cyprinus carpio</i>	+	-
<i>Cyprinus intha</i>	+	-
<i>Sawbwa resplendens</i>	-	+
<i>Barbonymus gonionotus</i>	+	-
<i>Systemus sarana</i>	-	+
<i>Puntius ticto</i>	-	+
<i>Puntius chola</i>	-	+
<i>Cirrhina latia</i>	+	-
<i>Labeo rohita</i>	+	-
<i>Yunnanilus brevis</i>	-	+
<i>Lepidocephalichthys berdmorei</i>	-	+
<i>Clarias batrachus</i>	+	-
<i>Heteropneustes fossilis</i>	+	-
<i>Monopterus cuchia</i>	+	-
<i>Mastecembelus oatesii</i>	+	-
<i>Mastecembelus caudicellatus</i>	+	-
<i>Parambassis ranga</i>	-	+
<i>Parambassis lala</i>	-	+
<i>Oreochromis mossambica</i>	+	-
<i>Oreochromis niloticus</i>	+	-
<i>Glossogobis giuris</i>	+	-
<i>Tricogaster labiosus</i>	-	+
<i>Channa striata</i>	+	-
<i>Channa harcourtbutleri</i>	+	-

+ = observed, - = not observed

Table 3. Categories of Selling fish species in Moe-byae reservoir

Selling fish species	Raw fish	Preserved fish species		
		Smoked fish	Dried fish	Salted fish
<i>Notopterus notopterus</i>	+	+	+	-
<i>Esomus metallicus</i>	+	-	+	-
<i>Devario auropurpureus</i>	+	-	+	-
<i>Ctenopharyngodon idellus</i>	+	-	-	+
<i>Cyprinus carpio</i>	+	-	-	-
<i>Cyprinus intha</i>	+	-	-	-
<i>Sawbwa resplendens</i>	-	-	+	-
<i>Barbonymus gonionotus</i>	+	-	-	-
<i>Systomus sarana</i>	+	-	+	+
<i>Puntius ticto</i>	+	-	+	+
<i>Puntius chola</i>	+	-	-	+
<i>Cirrhina latia</i>	+	-	-	+
<i>Labeo rohita</i>	+	-	-	+
<i>Yunnanilus brevis</i>	-	-	+	+
<i>Lepidocephalichthys berdmorei</i>	+	-	+	-
<i>Clarias batrachus</i>	+	+	-	-
<i>Heteropneustes fossilis</i>	+	+	+	-
<i>Monopterusuchia</i>	+	+	+	-
<i>Mastecembelus oatesii</i>	+	-	+	-
<i>Mastecembelus caudicellatus</i>	+	-	-	-
<i>Parambassis ranga</i>	+	-	-	-
<i>Parambassis lala</i>	+	-	+	-
<i>Oreochromis mossambica</i>	+	+	+	-
<i>Oreochromis niloticus</i>	+	+	+	-
<i>Glossogobis giuris</i>	+	-	-	-
<i>Tricogaster labiosus</i>	+	-	+	-
<i>Channa striata</i>	+	-	+	-
<i>Channa harcourtbutleri</i>	+	+	-	-

Discussion

In this study, 28 species, 21 genera, 13 families under five orders of fishes belong to class Osteichthyes were observed from Moe-byae reservoir, Pekhon Township during the study period.

In 2011, the IUCN Red List declared the Inle carp as endangered as it has been impacted by the introduction of some *Cyprinus* species in the lake. The conditions responsible for these threatened species may vary as a result of overfishing due to the demand. Nevertheless, the fingerlings of *Cyprinus intha* and *Labeo rohita* were released annually by Department of Fishery, Nyaung Shwe. It was alluded that the release of fingerlings is beneficial for sustainable fishery in Inle Lake, also important for maintaining the ecosystem and also support the livelihoods of the communities living in Lake (Seint Seint Win, 2018).

According to IUCN Red List (2016) *Mastecembelus aotesii* and *Cyprinus intha* are endangered, *Yunnanilus brevis* and *Devario auropurpureus* are vulnerable species in the conservation point of view. It may be that there was a continuing decline in habitat and overfishing of ornamental purposes.

A total of 17 species was identified of which catchability of the large fish species was more than small fishes (11 species) in study area. Among the 17 large size species, *Notopterus notopterus*, *Cyprinus carpio*, *C. intha*, *Oreochromis* spp., and *Channa striata* were more popular marketable fish.

Small fishes were important as for ornamental fish culture. Besides *Esomus metallicus*, *Devario auropurpureus*, *Sawbwa resplendens* and *Yunnanilus brevis* are endemic species of this region. Therefore, it should be managed to conserve for sustainable aquaculture. Since the price of large size fish group was higher than the small size group, they mainly caught the large size group fish for more income.

Monthly high income of each fisherman was welfare for the livelihood of their families. Besides, well enough for education fees of children, household use, facilities for transportation such as motorcycle and motorcar as well as for communication and information as mobile phone, internet, so on.

The fishermen got more income by selling the fish not raw fish but also preserved fish as smoked fish, dried fish, salted fish and pickled fish. Therefore, they get extra income and they can extend their business investment in another job. On the other hand, if they face the bad weather and climate change in fishing they could not harvest the fish usually they can do other business. And they can be peace in their livelihood.

In conclusion, the study revealed the major findings of socioeconomic status of fishermen from Moe-byae reservoir. The traditional fishing communities are important components in the reservoir as capture fishery sector. Fish marketing should take place on daily basis to support the basic needs of the present fishermen communities. There is need to control the use of illegal fishing gears as electro-fishing with battery shocks and the employment of small mesh size nets. To sustain the fishes in this area the Local Authorities (Department of Fishery) control the use of illegal fishing gears namely electro-fishing with battery shocks and the employment of small mesh size nets. Because the electro-fishing is severely effects on the reproduction and the early life stages of fish. Physical injury and mortality of fish are mainly due to electro-fishing.

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References

- Chambers R. and Conway, R., 1992. Sustainable Rural Livelihoods: *Practical Concept for the 21st century*, Discussion paper, IDS No. pp: 296.
- IUCN, 2011. IUCN Red List of Assessment, Available from: <http://www.fishbase.org/references> (accessed 27 December 2017).
- IUCN, 2016. *The IUCN Red List of threatened species, 2016-1*. <http://dx.doi.org>.
- Maxwell, D., 1999. Programmes in chronically vulnerable areas. *Challenges and Lessons Learnt, Disasters*, 23 (4): 373-384.
- Murray, F.J. and Little, D.C., 2000. Inland fisheries resources and the current status of aquaculture in Sri Lanka. *Working paper*, SL 1.2 Project R 7064. pp 1-11.
- Nwe Nwe Oo, 2013. Species composition, food preference and feeding ecology of fish fauna in Putao, Kachin State. *PhD Dissertation*, Department of Zoology, University of Mandalay.
- Parashar, V., Bara, S.K., Damde, D., Kumar, A., and Vyas, V., 2016. Assessment of the socioeconomic status of fishermen communities: a case study from a selected reach of River Narmada, India. *International Journal of Research in Fisheries and Aquaculture*. Department of Bioscience, Barkatullah University, Bhopal, Madhya Pradesh, 462026, India.
- Seint Seint Win, 2018. Species composition of fish and assessment on fishery sustainability in Inle Wetland, Nyaung Shwe Township, Southern Shan State. *PhD Dissertation*, Department of Zoology, University of Mandalay.