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A survey on fishing gears used for fishing in Sone beel, the largest wetland in Assam, Northeast India

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Abstract

Sone beel is dominated by two communities viz., Kaibarta and Patni. They have been practicing fishing mainly with traditional fishing gears. A survey was done to prepare a list of these fishing gears and bamboo made accessories. A total of 17 fishing gears and 4 bamboo made accessories were recorded. Present survey also revealed the status of occurrence of 54 taxa of fishes in Sone beel of which 22 taxa were abundant, 22 were frequent, 7 taxa were rare and three varieties of fish viz., *Cirrhinus reba*, *Gudusia chapra* and *Chitala chitala* were hardly found.

Keywords: Ichthyodiversity, fishing gears, bamboo made accessories, fishermen community, Sone beel

1. Introduction

Assam is gifted with many extensive water bodies commonly known as beels and haors. Beels are the major fishery resources contributing to about 25 % of the fish production in Assam^[1]. However, the rich biodiversity of the freshwater fish of Assam has been rapidly declining because of increasing degradation of inland water^[1]. Sone beel is the largest wetland in Assam having an area of 3458.12 ha^[2]. During winter season water level of this wetland shrinks to an area of 409.37 ha. Length of the beel is around 13.2 km and breadth is 4.2 km. Sone beel is connected with two major rivers of the valley viz., Singhla and Kochua. Other small rivers and canals are also connected with Sone beel. River Singhla contributes almost eighty percent of water of Sone beel^[2]. In summer season the entire Sone beel is filled with water and becomes common property. People belonging to Kaibarta and Patni community of Sone beel area engaged themselves in fishing from the month of April to the month of October-November. During December- January water disappeared and Sone beel becomes a vast cultivable paddy land^[2]. People cultivate Boro paddy during winter and harvest it in premonsoon season.

Sone beel harbours a wide variety of commercial and non-commercial fishes. But at present diversity as well as the quantity of fish is gradually decreasing. A diverse range of fishing gears and methods have been evolved over a long period of time by the fishermen community of Sone beel to capture a wide range of fish species. Selection of fishing gears depends on size of fishes. The fishermen also select fishing gears depending on the season for example; large sized fishing gears are generally used in rainy season when water level is high. Most of the fishing gears are of primitive traditional type^[1]. But fishermen of Sone beel use both traditional and modern fishing gears to capture fish. Traditional fishing gear is a device which could be defined as the fishing gear passed down from predecessors to present generation. These gears have their significance because they inherit the traditional knowledge of the community^[3]. Use of improper gear for fishing can hamper fish population and also potentiality of the beel. Keeping all these in mind, a detailed survey was done to focus on different type of fishing gears used for fishing in Sone beel. Besides fishing gears, traditional bamboo made accessories used during fishing or for storage also recorded during the present work. The aim of the present study was to document various types of fishing gears used by the Kaibarta and Patni community in Sonebeel and also to explore the status of occurrence various taxa of fish found in Sonebeel.

2. Methodology

The study was conducted from October 2015 to January 2016 at two villages viz., Dargarbond (Lat 24°40'21.1" N and Long 092°27'26.7" E) and Debodwar (Lat 24°42'07.2" N and Long

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092°27'18.5" E) of Sone beel area. All the information for the study was collected by preparing interview schedule with structured and semi-structured questionnaire. Fifty fishermen, randomly twenty five from each village were personally interviewed to obtain information on fishing gears both traditional and modern. Individual contacts were made and questions were asked about fishing gears, traditional bamboo made accessories, traditional fish catching methods, fish species found in Sonebeel and the causes of loss of fish diversity in Sonebeel. By means of informal interviews and interaction with old and young farmers and farm women, related information was also gathered. Description of the gears and other relevant information provided by the fishermen was recorded. Photographs of different types of fishing gears and bamboo made accessories were taken.

3. Results

The survey regarding the fishing gears used in Sone beel revealed that fishermen of the study area have been using 17 different types of fishing gears to earn their livelihood. Among these, most of the gears were used for catching small and medium sized fishes. Only 3 gears were used for catching large sized fishes. Among these 17 gears 7 were bamboo made, 4 with bamboo and other materials like tin, rod etc. and 6 with synthetic net. 4 bamboo made traditional accessories used for immediate storage of fish were also recorded during the survey (Table 1). Table 2 revealed status of occurrence of 54 taxa of fishes in Sonebeel of which 22 taxa were abundant, 22 were frequent, 7 taxa were rare and three varieties of fish locally known as Lacho fish (*Cirrhinus reba*), Chapila fish (*Gudusia chapra*) and Chital (*Chitala chitala*) were hardly found.

Table 1: List of fishing gears and accessories used to catch fish in Sonebeel with description

Sl. no.	Name of fishing gears/ accessories	Description	Price	Fish captured
1.	Dori (Small)	Bamboo made	150-200	Used to capture small fish
2.	Dori (Large)	Bamboo made	200-250	Used to capture small and medium sized fish
3.	Polo	Bamboo made	200-300	Used to capture small and medium sized fish
4.	Faron	Bamboo made	300-350	Used to capture Small and medium sized fish
5.	Dhir	Bamboo made	100-150	Used to block the passage of fish through small canals
6.	Borshi	Made with a bamboo stick and a hook is hanged with the help of threads	50-100	Used to capture small and medium sized fish
7.	Runga	Bamboo made	120-150	Used to capture small fish
8.	Nowra	Made with a tin sheet and a bamboo stick.	50-80	Used during fishing in small ponds
9.	Jhata	Made up of small pieces of rod bunched in a bamboo stick or handle.	100-120	It is used for killing Small fishes
10.	Trikun Jaal	Jaal is triangular in shape, made with bamboo frame and net.	200-280	Used to capture small fish
11.	Jhimti	It is triangular in shape made up of synthetic net with a bamboo frame.	500-800	Used to capture small fish
12.	Uraal Jaal (Small)	Made with synthetic net	300-400	Used to capture small and medium sized fish
13.	Uraal Jaal (Large)	Made with synthetic net	500-700	Used to capture small and medium sized fish
14.	Mushari Jaal	Made with synthetic net consists of small gaps in it.	800- 1000	Used to capture medium and large sized fish
15.	Puthi Jaal	Made with synthetic net.	300-450	Used to capture small and medium sized fish
16.	Fansh Jaal	Made with synthetic net consists of very small gaps in it.	1000- 3000	Used to capture medium and large sized fish
17.	Tana Jaal	Made with synthetic net consists of moderate gap in it.	5000-10000	Used to capture large fish
18.	Kholoi I	Bamboo made	120-150	Used to keep fishes after being captured
19.	Kholoi II	Bamboo made	150-180	Used to keep fishes after being captured
20.	Tukri	Bamboo made	250-350	Used to keep a large number of fishes after being captured
21.	Dala	Bamboo made	100-120	Used to cover the Tukri and sometimes to keep small fishes

Table 2: Distribution of fish species found in Sonebeel

Sl.no.	Scientific name	Status of occurrence
1	<i>Cyprinus sp.</i>	+++
2	<i>Puntius sp.</i>	+++
3	<i>Labeo rohita</i>	+++
4	<i>Catla catla</i>	++
5	<i>Cirrhinus mrigala</i>	++
6	<i>Labeo boggut</i>	++
7	<i>Hypophthalmichthys molitrix</i>	++
8	<i>Ctenopharyngodon idella</i>	++
9	<i>Walago sp.</i>	++
10	<i>Batasio sp.</i>	+++
11	<i>Channa sp.</i>	+++
12	<i>Heteropneustes fossilis</i>	+++
13	<i>Esomus sp.</i>	+++
14	<i>Penaeus sp.</i>	+++
15	<i>Clarias sp.</i>	+++
16	<i>Hilsa ilisha</i>	+
17	<i>Pangasius pangasius</i>	++
18	<i>Oreochromis mossambica</i>	++
19	<i>Pangasius pangasius</i>	+++
20	<i>Danio sp.</i>	++
21	<i>Mystus sp.</i>	++
22	<i>Aspidopariasp.</i>	+
23	<i>Amblypharyngodon sp.</i>	+++
24	<i>Bariliussp.</i>	+
25	<i>Salmostoma sp.</i>	++
26	<i>Somileptus sp.</i>	++
27	<i>Gagatasp.</i>	+
28	<i>Rita sp.</i>	++
29	<i>Glyptothoraxsp.</i>	+
30	<i>Chaca sp.</i>	+
31	<i>Xenentodon sp.</i>	+++
32	<i>Channa sp.</i>	+++
33	<i>Chanda sp.</i>	+++
34	<i>Tetraodonsp.</i>	+
35	<i>Parambassis sp.</i>	+++
36	<i>Badis sp.</i>	+++
37	<i>Nandus sp.</i>	++
38	<i>Anabas sp.</i>	+++
39	<i>Colisa sp.</i>	+++
40	<i>Macrornathus sp.</i>	+++
41	<i>Mastacembelus sp.</i>	+++
42	<i>Glossogobius sp.</i>	+++
43	<i>Sicamugil sp.</i>	++
44	<i>Rhinomugil sp.</i>	++
45	<i>Amphipnoussp.</i>	++
46	<i>Ompoksp.</i>	++
47	<i>Clupisomasp.</i>	++
48	<i>Ailiasp.</i>	++
49	<i>Lepidocephalichthys sp.</i>	+++
50	<i>Botia sp.</i>	++
51	<i>Pisodonopphis sp.</i>	++
52	<i>Cirrhinus reba</i>	-
53	<i>Gudusia chapra</i>	-
54	<i>Chitala chitala</i>	-

'+++’ represent abundant, ‘++’ represent frequent, ‘+’ represent rare and ‘-’ represent absent

Source: Fishermen community of the study area.



Fig 1-21: (1)- Dori (small); (2)- Dori (large); (3)- Polo; (4)- Faron; (5)- Kholoi-(I); (6)- Tukri; (7)- Dala; (8)- Kholoi (II); (9)- Nowra; (10)- Jhata; (11)- Borsi; (12)- Dhir; (13)- Dori (properly placed Dori for easy capture of fish within a bamboo fenced area); (14)-Trikun Jaal; (15)- Jhinti; (16)- Puthi Jaal; (17)- Moshari Jaal; (18)- Tana Jaal; (19)- Fansh Jaal; (20)- Ural Jaal (large); (21)- Ural Jaal (small).

4D4. Discussion

The survey revealed that a diverse range of fishing gears (Table 1) and methods have been evolved over a long period of time by the fishermen community of the Sone beel to capture a wide range of fish species. Commercial use of 36 different types of fishing gears were reported from Nalbari district of Assam [1] and fishing gears of the study area have great similarity with that of Nalbari. Different varieties of bamboo made gears and nets were used for catching fish in the study area. Even very small fishes were caught by using special nets. Selectivity of gear for fishing is influenced by several factors such as the topography of the water body, behaviour of fishes, economic viability of fishermen, availability of the material, seasonal changes, hydrological parameters of the lake, etc.[4]. Besides these, use of traditional fishing gears by Kaibarta and Patni community in Sonebeel area largely depends on the availability of resources as well as fishes to be caught. Similar observation was made in Birbhum district, West Bengal, India [3]. Present study reported status of occurrence of 54 taxa of fish. In 2006, 69 species of fishes belonging to 49 genera were reported from Sone beel[5]. Gradual decline in ichthyodiversity indicates overexploitation of fish resources and improper use of different fishing gears in the absence of other livelihood options. Though in Assam, there is restriction on fishing, (Development of Fisheries, Government of Assam, Rule No 23-A) and also use of net is prohibited during breeding season (Rule no 23). Fishermen communities of the study area are using all these fishing gears indiscriminately and in an unplanned way. Small as well as large sized fishes are being captured in improper way for

which reproduction rate of fishes also greatly affected. The fishermen communities are of the opinion that decline in ichthyodiversity in Sone beel is mainly because of the degradation of the water bodies due to various reasons viz., decreasing depth of Sone beel due to siltation, dumping of garbage and disposal of wastes; expansion of agricultural land and brick kiln industry; indiscriminate use of chemical fertilizer and pesticides. Moreover, due to irregular and insufficient rainfall, sometimes water depth becomes low and also water does not remain in entire beel throughout the year. Another reason for reduction of fish species is that production or culture of fish is very less in comparison to the rate of fishing.

5. Conclusion

The present study revealed that fishermen of the study area have been using 17 different types of fishing gears to catch fish. The majority of the inhabitants of the study area mainly dependent on the fisheries and agriculture for their livelihood and traditional fishing gears are playing very important role in maintenance of livelihood of the people of the study area. The present study revealed that the production and diversity of the fish species are declining day by day. If fish catching in Sone beel continued in this way without control then many valuable fish species will become extinct and Sone beel would be empty of fish in near future. This can be minimized to a large extent if knowledge regarding scientific technique of using different fishing gears are given to fishermen of the study area and also if controlled fishing is practiced during breeding season. Govt., NGOs and educated people of the area can come forward to spread awareness among fisherman community regarding harmful effects of over-exploitation of fishes. Poor fishermen community should be provided with alternative livelihood options. Finally, efforts should be undertaken to develop ecosystem-based management strategies and participation and empowerment of fisherman community should be ensured for sustainable development of these resources.

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