

A Study on Ichthyofaunal Diversity and Fishing Gears Used in the Wetlands Areas Nearby Nimati Ghat, Jorhat, Assam

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The North East of India is rich in biodiversity. There are various species of fish found in the rivers, lakes and ponds of the region. Different ethnic groups from this region use different types of techniques to catch these fish. To study different aspects of fish, the study of fishing gears is prerequisite. People of Assam use different types of indigenous fishing gears to catch fish. Most of these fishing gears are made of bamboo. In the current study, attempts were made to analyse the ichthyofaunal biodiversity along with indigenous tools used to catch fish in the wetlands areas nearby Nimati Ghat in Jorhat. A study was conducted to record the traditional fishing techniques used in these places, and it had been discovered that there were ten various kinds of traps, nets, and hooks used for fishing. Many synthetic nets replace the traditional fishing gears. During the study, different kinds of fish were recorded from the study areas.

Keywords: Diversity; Fish; Fishing gears; Jorhat; Wetland.

North East India is one of the hotspots of freshwater fish biodiversity in the world.¹ The number of fishes reported from this area has varied greatly, ranging from 172 to 267.^{2,3} Assam is home to about 1.03 lakh hectares of lentic natural water bodies, including wetlands connected to the Brahmaputra, Barak, and their tributaries. Wetlands, which make up approximately 6% of the earth's surface and are the most significant ecosystem, are a crucial component of both the terrestrial and aquatic ecosystems. Fish diversity is rich in the wetland ecosystems.⁴⁻⁹ Studies have recorded the presence of 217 different fish species in different wetlands of Assam.¹⁰

The effectiveness of the materials used, the availability of fish, the choice of location, the timing, and other factors all affect how well a fishing approach works. Traditional, non-mechanized, and primarily locally made are the fishing equipment and crafts used in Assam. In Assam, methods such as grapping and the use of enormous, locally built nets are used to catch various types of fish due to the widely diversified natural water regions of the state.

The choice of equipment may vary according to the time of year, the body of water, the kind of fish targeted, and the efficiency of the equipment based on certain accepted standards.

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Numerous works have been carried out on the fishing gears, practices and cultural aspects of fisher folk by different authors across India; some authors have studied various aspects of fishing gears in different parts of Assam.¹¹⁻¹⁷ Different workers have studied the community fishing and economic aspects of fishermen communities in Assam.¹⁸⁻²¹

A thorough survey was conducted to focus on the various types of fishing equipment used for fishing in Borsola beel with all of these factors in mind. Objectives of this current study were to catalogue the various fishing techniques employed by the Kaibarta population in Borsola beel and to investigate the frequency of occurrence of different fish species there.

MATERIALS AND METHODS

The Borsola wetland (Open beel), which is about 5 kilometres to the northeast of Jorhat town in Assam, is situated in the geographic coordinates 26.048 N-26.049 N and 94.008 E-94.010 E. Fisherman collected the fish samples from the study area from 2021 to 2022. Moreover, fish were

gathered from the fish landing spots. For further research, collected specimens were stored in a 5% formaldehyde solution. The fish species were identified in accordance with accepted literature.²²⁻²³ Fishermen were asked about the features of the gears they used, their mode of operation and the kinds of fish they catch.

RESULTS AND DISCUSSION

This study found the presence of 60 fish species from 20 families in different wetlands of Nimati, Jorhat, Assam. Several different types of gears to catch fish have been documented during the research period. Different indigenous fishing gears, their characteristics and type of fish they catch etc. are mentioned in Table 1. Scientific name, local name, family and their conservation status are mentioned in Table 2.

Berjal

It is a big rectangular seine net, and the term “tanaber” also refers to the surrounding net. The net is closed in a semicircle, using the coast as its foundation, and is slowly pulled in at each end



Fig. 1. Uvoti



Fig. 2. Ghat Jal



Fig. 3. Ghat jal



Fig. 4. Gheko

Table 1. Types of fish caught by the Gears and the production price

Name of Gear	Description	Catches	Individuals required	Production price(Rs)	Operational time	Captured fish (kg)	Earnings (Rupees per day)
Berjal	It is a big rectangular seine net. Now-a-days mosquito net is also used.	All fishes are caught indiscriminately using plastic nets .	7 -10	6000-10000	1-3 days	Up to 400-500	500-1500
Phansi jal	It is made up of delicate nylon fibre of different mesh sizes with floats and sinks.	Different fishes up to 1-2 kg sizes are caught.	1-2	500-5000	6-7 hours	1-5	300-1000
Cast net (Khewali Jal)	Made with synthetic net consists of very small gaps in it.	Catches all fishes according to type of net and mesh size.	1	2000-5000	5-10 minuteseach	4-6	700-1000
Polojal	Made up of triangular net fitted in a bamboo frame	Large sized fish of the species Labeo, <i>Channa mauralius</i> etc. are caught	1	8-1000	15-30 minutes	1-10	500-2000
Ghat jal	Made up of large triangular net fitted in a bamboo frame	Small and medium sized fishes are caught in large numbers.	1	5000-1000	2-5 minutes	1-100	500-10000
Sip Boroshi, Nal Boroshi, Dham Boroshi	Made of Thin Bamboo Sticks with a thread bind in the anterior end of the stick and hooks at the end of the thread.	Carnivorous fishes like Walagoo, Channa species are caught.	1	50-100	30-60min	.50-4	150-300
Uvoti	It is constructed with thin bamboo sticks and placed with baits for trapping carnivorous medium sized fishes e.g. Clarias	Carnivorous medium sized fishes e.g. Clarias	1	20-50	30min	10-15kg	150-300

Table 2. Diversity of Fishes in Borsola Beel

No.	Scientific Name	Common Name	Family	Frequency	Conservation status
1	<i>Chitala chitala</i> (Ham)	Chital	Notopteridae	Common	EX-NA
2	<i>Notopterus notopterus</i> (Pallas)	Kandhuli	Notopteridae	Very common	LC
3	<i>Gudusia chapra</i> (Ham)	Koroti	Clupeidae	Common during Summer	EX-NA
4	<i>Hilsa ilisha</i> (Ham)	Ilish	Clupeidae	Common	EX-NA
5	<i>Amblypharyngodon mola</i> (Ham)	Mowa	Cyprinidae	Very common	LC
6	<i>Pseudeutropius atherinoides</i>	Bordua	Cyprinidae	Common	LC
7	<i>Aspidoparia morar</i> (Ham)	Boriala	Cyprinidae	Occasional	EX-NA/DD
8	<i>Catla catla</i> (Ham)	Bahu	Cyprinidae	Common	LC
9	<i>Chela atper</i> (Ham)	Selkona	Cyprinidae	Common	EX-NA
10	<i>Cirrhinus mrigala</i> (Ham)	Mirika	Cyprinidae	Very common	LC
11	<i>Cirrhinus reba</i> (Ham)	Bhangun	Cyprinidae	Common	LC
12	<i>Esomus denricus</i> (Ham)	Dorikona	Cyprinidae	Very common	EX-NA
13	<i>Labeo rohita</i> (Ham)	Rahu	Cyprinidae	Very common	EX-NA
14	<i>Labeo beta</i> (Ham)	Bhangon	Cyprinidae	Common	EX-NA
15	<i>Labeo boga</i> (Ham)	Bogabata	Cyprinidae	Common	EX-NA
16	<i>Labeo calbasu</i> (Ham)	Mali	Cyprinidae	Common	EX-NA
17	<i>Labeo gonius</i> (Ham)	Kunhi	Cyprinidae	Very common	EX-NA
18	<i>Punctius chola</i> (Ham)	Cheni puthi	Cyprinidae	Common	EX-NA
19	<i>Punctius phutunio</i> (Ham)	Chokori puthi	Cyprinidae	Very common	EX-NA
20	<i>Punctius sarana</i> (Ham)	Kani puthi	Cyprinidae	Common	EX-NA
21	<i>Punctius sophore</i> (Ham)	Puthi	Cyprinidae	Very common	EX-NA
22	<i>Punctius ticto</i> (Ham)	Henduri puthi	Cyprinidae	Common	EX-NA
23	<i>Rasbora daniconius</i> (Ham)	Dorikona	Cyprinidae	Common	EX-NA
24	<i>Ctenopharyngodon idella</i> (Valenciennes)	Common carp	Cyprinidae	Common	LC
25	<i>Cyprinus carpio communis</i> (Linn)	Silver carp	Cyprinidae	Common	VU
26	<i>Botia dario</i> (Ham)	Gethu	Cobitidae	Common	LC
27	<i>Aorichthys aor</i> (Ham)	Ari	Bagridae	Common	LC
28	<i>Mystus bleekeri</i> (Ham)	Singara	Bagridae	Common	LC
29	<i>Mystus cavasius</i> (Ham)	Lalua singara	Bagridae	Very common	LC
30	<i>Mystus tengra</i> (Ham)	Singara	Bagridae	Common	LC
31	<i>Mystus vittatus</i> (Bloch)	Singara	Bagridae	Common	LC
32	<i>Rita rita</i> (Ham)	Ritha	Bagridae	Common	LC
33	<i>Ompok bimaculatus</i> (Bloch)	Bami	Siluridae	Common	NT
34	<i>Ompok pabda</i> (Ham)	Pavo	Siluridae	Common	NT
35	<i>Ompok pabo</i> (Ham)	Pavo	Siluridae	Common	NT
36	<i>Wallago attu</i> (Schneider)	Borali	Siluridae	Common	VU
37	<i>Alia colia</i> (Ham)	Kokila	Schilbeidae	Common	EX-NA/DD
38	<i>Dario dario</i> (Ham)	Gatho	Badidae	Common	DD
39	<i>Monopterus cuchia</i> (Ham)	Cuchia	Symbranchidae	Common	LC
40	<i>Heteropneustes fossilis</i> (Bloch))	Singi	Heteropneustidae	Common	EX-NA/DD

41	<i>Chaca chaca</i> (Ham)	Kurkuri	Chacidae	Common	LC
42	<i>Xenentodon cancila</i> (Ham)	Kokila	Belonidae	Common	LC
43	<i>Chanda nama</i> (Ham)	Chanda	Chandidae	Common	LC
44	<i>Parambasis ranga</i> (Ham)	Chanda	Chandidae	Very Common	EX-NA/DD
45	<i>Parambasis baculis</i> (Ham)	Chanda	Chandidae	Common	EX-NA/DD
46	<i>Nandus nandus</i> (Ham)	Gadgedi	Nandidae	Common	LC
47	<i>Glossogobius giuris</i> (Ham)	Patitmutura	Gobidae	Common	DD
48	<i>Anabus testudinius</i> (Ham)	Kawoi	Anabantidae	Very common	VU
49	<i>Colisa fasciata</i> (Schneider)	Kholihona	Belontidae	Very common	EX-NA/DD
50	<i>Colisa lalia</i> (Ham)	Kholihona	Belontidae	Common	EX-NA/DD
51	<i>Channa barca</i> (Ham)	Futuki senga	Channidae	Common	DD
52	<i>Colisa gachua</i> (Ham-Bloch)	Sengali	Channidae	Very common	LC
53	<i>Colisa marulius</i> (Ham)	Saal	Channidae	Common	LC
54	<i>Colisa punctatus</i>	Goroi	Channidae	Common	LC
55	<i>Colia stewarti</i> (playfair)	Sol	Channidae	Common	LC
56	<i>Colisa straitus</i> (Bloch)	Sal	Channidae	Common	LC
57	<i>Macrognathus aculeatus</i> (Bloch)	Tora	Mastacembelidae	Common	LC
58	<i>Macrognathus punctatus</i> (Ham)	Jati tora	Mastacembelidae	Common	EX-NA/DD
59	<i>Macrognathus astacambelus aral</i>	Tora	Mastacembelidae	Common	EX-NA/DD
60	<i>Tetrodon cutcutia</i> (Ham)	Gangatup	Tetrodontidae	Common	EX-NA/DD



Fig. 5. Gheko



Fig. 6. Gheko

to raise it onto the ground. After the boat detects the net, it travels towards coast. The catch is then gathered at the centre of the net once the net has been brought up. Berjal needs 10-15 persons and 7 to 4 boats to operate. The majority of the catch composition is made up of species such *Wallago attu*, *Rita rita* etc.

Gheko

It is a fishing device generally constructed in the outlet of the wetland to the nearby river. It is mainly made up of “banas” (bamboo). Before winter, fishes go out of the wetland through the feeding channel and they are caught while entering this device .

Phansijal

A typical gill net called a *phansijal* is smaller than a *langijal*. Additionally, it has a rectangular form and is composed of lightweight materials like nylon or hemp. This net is controlled by connecting it to a support (often bamboo) at one end of the river, and a rope is fastened to the other side.

Cast Net (Khewali jal)

Khewali jal, a cast net, is the most common type of gear in the study area. It is a conical cast net with an 8–15 mm mesh size, measuring 2–2.5 metres in length. The cone’s bottom circular border is doubled and ranges in height from 30 to 50 cm. The cone’s tip has a rope tied to it. The fisherman’s right hand held the folded net while his left held the rope’s end. Typically, all fish species are captured with this net.

Ghat Jal

It is made of triangular net fitted in a bamboo frame. The wide mouth side of the net is placed in the flowing water body opposite to water current. Fishes enter the net and they are caught in large number by dragging it up by weigh of the fisherman and kept alive in cage made by net.

Line and Hooks

Different types of lines and hooks are used to catch medium to big sized fishes which are as follows:

Sip boroshi

It is made of bamboo, which is frequently longer than 6 metres. A nylon line with a hook and a grasshopper or earthworm or small forage fish as bait is fastened to the tip of the bamboo. This type of hooks is used to catch small and indigenous fishes.

Nal boroshi

In this type a short line is attached with a floating piece of *Nal*(a hollow stem of riverine grass).In the other end a small live fish is attached to the hook and released to open lentic water bodies at night. Mostly *Channa* species are caught by this method.

Dham boroshi

Here many hooks with small pieces of lines are attached to a long rope and kept in suitable water bodies during night hours. Many fishes are hooked in this process.

Uvoti

It is constructed with thin bamboo sticks and placed with baits for trapping carnivorous Fishes. Mostly *clarius* species are caught in this process.

Polojal

Made up of triangular net fitted in a bamboo frame. Large sized fish of the species *Labeo*, *Channa maulius* etc. are caught.

CONCLUSION

In the present study, it has been found that the quantity of fishes caught in every gear has been decreasing resulting over exploitation of wetlands. Indiscriminate catching of fishes violating fishing laws results in lesser production in the successive years. For conservation of indigenous fish species and the traditional gears indiscriminate fish catching during breeding season must be banned.

According to the current study, fish are caught in the study region using different types of fishing equipment. The majority of people living in the study region depend primarily on agriculture and fishing for their livelihood, and traditional fishing gear plays a significant role in preserving their way of life.

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Conflict of Interest

There is no conflict of interest.

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