E-ISSN: 2347-5129
P-ISSN: 2394-0506
(ICV-Poland) Impact Value: 5.62
(GIF) Impact Factor: 0.549
IJFAS 2021; 9(4): 306-309

www.fisheriesjournal.com
Received: 10-05-2021
Accepted: 12-06-2021

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Study on fish catching devices used by the fishing community of Dewaddhar village of Sonebeel, Assam, India

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DOI: https://doi.org/10.22271/fish.2021.v9.i4d.2548

Abstract
The present study was intended to document the various fishing gears used by the fishermen community of Dewaddhar Village of Sonebeel. A field survey was conducted to catalogue the different traditional fishing gears of the area along with the efficacy of those gears, which revealed around 8 different types of fishing gears and around 40 species of ichthyofauna belonging to 20 families.

Keywords: Dewaddhar village, Sonebeel, fishing gears, ichthyofaunal diversity, fishermen community

Introduction
The North-Eastern region of India is harbored by extensive lentic and lotic water bodies of which prominent wetlands like Sonebeel is the home to a wide diversity of ichthyofauna.
Sonebeel has an area of around 3458.12 ha and is considered as the largest seasonal wetland of Assam and the second largest in Asia. Sonebeel has geographic coordinates between 92°24'50" to 92°28'25" E and 24°36'40" to 24°44'30" N and falls in Karimganj district of Assam. The beel is fed with water by the major inflow of the Singla River alongside 12 minor inlets. The major outflow of the beel is River Kachua which drains the water from Sonebeel to the mighty Kushiara River.
Sonebeel shows the characteristics of seasonal wetland and it reaches its full storage level during monsoon months and the fishermen community (consisting of mainly Kaibarta and Patni) engage themselves in extensive fishing in the beel area. The beel dries up during winter months leaving a vast fertile cultivable paddy land commonly used by the locals for paddy cultivation.
Many species of commercial and non-commercial importance are abundantly found in Sonebeel. A diversity is also seen in the operation of fish-catching devices in Sonebeel which have evolved over time. The fishermen community here uses a wide array of fishing devices with varying sizes, structure and modus operandi. Many modern and traditional fishing gears are used here depending on the seasonality, water level, types of fishes to be caught etc.
The traditional fishing gears are socially significant as they speak about the traditional knowledge of the fishing communities. But improper use of fishing gears can lead to a decline in the fish production potential of this wetland and there is seen a significant decline in the fish production as per the information gathered from the locals of Sonebeel area of which overfishing or improper use of fishing gears might be a reason. Keeping all these in mind a detailed survey was conducted to study and to document the different fishing gears of this wetland.

Methodology
The present study was conducted in Dewaddhar Village **(**24°42'07.2" N and 092°27'18.5" E) of Sone beel area during the month of February 2021. All the relevant data of the fishing gears were collected by field survey and personal interview with the fishermen.. The description of the gears and their modus operandi and other relevant information provided by the fishermen were recorded in the relevant section of the questionnaire. Information on availability of ichthyo faunal diversity was recorded. The photographs of different fishing crafts and gears were also documented.

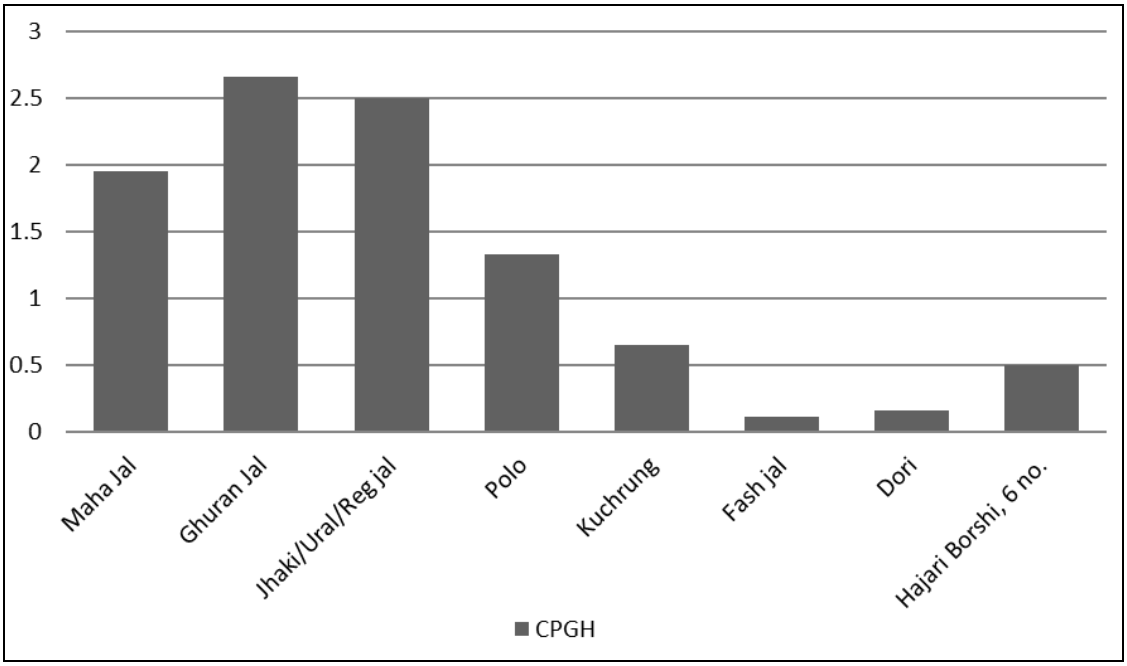
Result

The survey conducted in Dewaddhar Village revealed that the fishermen community of this area mainly use eight different types of fishing gears comprising of nets, hooks and bamboo traps. These gears are mostly indigenous with different size, shape, method of operation and efficacy.

Details of these fishing gears are briefly tabulated below:

Table 1: Analysis of different fishing gears operated in Dewaddhar Village of Sonebeel

Sl. No.	Gear name (local name)	Gear type	Main fishes caught	Total wt. of fish caught (kg)	No. of persons operating the gear	Time period of gear operation	Cost of gear fabrication (Rs.)	Total income from the gear (Rs.)	CPGH
1	Maha Jal	Encircling gear	All kind of fishes	≈250	16 nos.	At night/day time (8 hrs)	≈2.5 - 3 lacs	≈8000 (per catch day)	1.953125
2	Ghuran Jal	Encircling gear	All kind of fishes	8	3 nos.	Day/Night (1 hr)	40000	1200 (per catch day)	2.666666
3	Jhaki Jal/Ural Jal/ Reg Jal	Cast net	Small sized fishes	5	2 nos.	Day time (30 min - 1 hr)	≈3000	600 (per catch day)	2.5
4	Polo	Bamboo Trap	Medium sized fishes	3-4	1 no.	Day time (2-3 hrs)	1000	500-800 (per catch day)	1.33
5	Kuchrung Jal	Purse net	Small sized fishes	≈2.5 - 3	2 nos.	Day/Night (2 – 3 hrs)	1500-1600	500 – 600 (per catch day)	0.65
6	Fash Jal	Gill net	Small to medium sized fishes	2-5	6-8 nos.	Day/Night (3-10 hrs)	5000 - 20000	≈500-2500 (per catch day)	0.1111
7	Dori	Bamboo Trap	Small sized fishes	1.5 – 2 kg	1 no.	Night (12 hrs)	500-600 (per trap)	500-700 (per catch day)	0.166
8	Hajari Borshi, 6 No.	Hook and line	Small to medium sized fishes	2-3	1 no.	Night (6 hrs)	2000	300 – 400 (per catch day)	0.5



CPGH of the different fishing gears

Table 2: Status of ichthyofaunal diversity of Sonebeel (recorded from the conversation with the locals)

Sl. No.	Scientific name	Vernacular name	Family	Availability Status
1	*Ailia coila*	Kajuli	Ailiidae	***
2	*Anabas testudineus*	Koi	Anabantidae	***
3	*Mystus cavasius*	Tengra	Bagridae	***
4	*Mystus tengara*	Tengra	Bagridae	****
5	*Rita rita*	Ritha	Bagridae	**
6	*Xenentodon cancilla*	Kaikka	Belonidae	***
7	*Botia Dario*	Rani	Botiidae	**
8	*Channa punctata*	Cheng	Channidae	****
9	*Channa striata*	Shole	Channidae	***
10	*Gudusia chapra*	Chapila	Clupidae	***
11	*Labeo rohita*	Rui	Cyrpinidae	***
12	*Catla catla*	Katla	Cyprinidae	***

13	*Cirrhinus mrigala*	Mrigel	Cyprinidae	***
14	*Labeo calbasu*	Kalia Baush	Cyprinidae	**
15	*Cyprinus carpio*	Common Carp	Cyprinidae	***
16	*Hypophthalmichthys molitrix*	Silver Carp	Cyprinidae	***
17	*Ctenopharyngodon idella*	Grass Carp	Cyprinidae	***
18	*Labeo bata*	Bata/ Bhangan	Cyprinidae	**
19	*Chela laubuca*	Chelabaia	Cyprinidae	***
20	*Esomus danricus*	Darkina	Cyprinidae	**
21	*Puntius conchonius*	Shor Puthi	Cyprinidae	***
22	*Puntius ticto*	Puthi	Cyprinidae	****
23	*Puntius sophore*	Bhari puthi	Cyprinidae	***
24	*Osteobrama cotio*	Chela	Cyprinidae	**
25	*Salmophasia bacaila*	Bhaiachela	Cyprinidae	**
26	*Amblypharyngodon mola*	Moka	Danionidae	**
27	*Glossogobius giuris*	Baligora	Gobiidae	***
28	*Mastacembelus armatus*	Baim	Mastacembelidae	***
29	*Nandus nandus*	Bheda	Nandidae	***
30	*Notopterus notopterus*	Kangla	Notopteridae	***
31	*Chitala chitala*	Chitol	Notopteridae	**
32	*Pisodonophis boro*	Kuchia	Ophichthidae	**
33	*Trichogaster fasciata*	Kholisha	Osphronemidae	***
34	*Pangasius pangasius*	Pangas	Pangasiidae	**
35	*Silonia silondia*	Vacha	Schilbeidae	***
36	*Ompok pabda*	Pabda	Siluridae	***
37	*Wallago attu*	Boal	Siluridae	***
38	*Mystus aor*	Arr	Siluridae	***
39	*Monopterus cuchia*	Kuchia	Synbranchidae	**
40	*Tetraodon cutcutia*	Beng	Tetradontidae	**

Note: "****" Signifies Abundant availability; "***" Signifies Moderate availability; "**" Signifies Less availability

A. B. C. D.

E. F. G

Fig 1: (a) Mahajal; (b) Jhakijal; (c) Polo; (d) Kuchrungjal; (e) Dori; Fashjal; Hajariborshi; (f) Hajariborshi; (g) Ghuranjal

Discussion

The field survey revealed that the fishing community of Dewaddhar Village of Sonebeel area mostly use 8 different types of fishing gears consisting of nets, bamboo traps and hook and line (Table 1), according to the availability of fish species and the physical condition of the wetland, which plays a very pivotal role on fishing operation. The discussion with the local fishermen also revealed that the majority of the locals mostly use the gill net (Fash jal) and cast net (Jhaki jal) for catching commercial fishes.

The study also revealed that most of the gears exhibit seasonality in their operation. The Mahajal is operated mainly during the monsoon season, while the cast net (Jhaki jal) is perineal in their mode of operation. It also revealed that the different gears are operated to catch different size of fishes ranging from small, medium and large. For instance, the Mahajal is operated to catch all kind of fishes while the Hajari borshi, Dori, Polo and Kuchrung jal are used to catch medium and small fishes (Table 1).

Considering the efficacy of the gears which was determined by CPGH (Catch/Person/Gear/Hour) calculation , it was found that the Ghuran jal (Encircling gear) seems to be the most efficacious followed by Maha jal (Encircling gear) and Polo (Bamboo trap) (Table 1).

The present study also revealed the occurrence of 40 different species of ichthyo fauna belonging to 20 families signifying their availability status in this wetland (Table 2).

Conclusion

The study highlighted that the fishermen community of Dewaddhar village of Sonebeel area have mostly been using 8 different types of fishing gears for fishing operation. The area is inhabited by native fishermen who are dependent mostly on fishing activities to earn their livelihood besides some of them are also engaged in agricultural practices during dry season of winter when the major portion of the wetland partially dries up. The study also revealed that there is a gradual decline in the fish diversity of the wetland due to different anthropogenic as well as natural factors. Illegal (extensive fishing during breeding season, improper use of gill net etc) and overfishing might be the cause of this gradual decline which needs to be checked as it is a need of the hour to save the ichthyodiversity of this wetland on which the livelihood of the fishing community are dependent upon.

Acknowledgement

The author is thankful to the local fishermen of Dewaddhar village of Sonebeel who shared all their valuable information about the various fishing gears during the survey period. Furthermore, the author is also thankful to the officials of ICAR KVK Hailakandi for their valuable cooperation in carrying out this survey.

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