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Ichthyofaunal diversity and anthropogenic stress on choutra naitara wetland of Goalpara, Assam, India

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Abstract

An investigation was carried out from Feb 2016 to May-2017 on the Choutra Naitara Wetland of Goalpara District, Assam to evaluate the present status of fish diversity and current Anthropogenic stress upon the wetland. Situated on the East of Goalpara district, nearest to Rangjuli town Choutra Naitara wetland covers an area of 220 ha. A total of 50 species belonging to 38 Genera, 08 orders and 21 Families have been recorded from the wetland. As per IUCN status (2017-2), 5 species were nearly threatened (NT), 1 species vulnerable (VU), 42 species were least concern (LC) and 2 data deficient (DD). 3 exotic species have been recorded. This wetland is drained by two rivers, namely Korno and Jura coming out from the East Garo Hills of Meghalaya. Out of 8 orders recorded Perciformes was the highest contributing 07 families. Among families, Cyprinidae was recorded highest with 17 representative species followed by Bagridae having 6 species. Currently the wetland is susceptible to varied anthropogenic stress such as population pressure, illegal settlements, Overfishing, agricultural activities etc which have resulted in massive destruction to the wetland ecosystem. Some strategies such as awareness programme to educate the local people, control water pollution, controlled harvesting of fish etc. must be implemented for conservation to the native fish species of the Wetland.

Keywords: Fish diversity, wetland, anthropogenic threats

1. Introduction

Wetlands are one of the most productive ecosystems and play crucial role in hydrological cycle. Utility wise, wetlands directly and indirectly support millions of people in providing services such as storm and flood control, clean water supply, food, fiber and raw materials, scenic beauty, educational and recreational benefits (NWIA_Assam_Atlas.2010) [8]. India has extensive floodplain wetlands, defined as low-lying areas bordering large rivers, which are seasonally inundated by the overspill from the main river channel. These wetlands are an integral component of the Ganga river and the Brahmaputra river basins, covering an area of 0.2 million hectares (Sugunan *et al.* 2000) [10]. The State of Assam has the maximum number and water area under floodplain wetlands, mainly associated with the rivers Brahmaputra and Barak which are locally known as beel. Assam possess 1513 wetlands out of which 1392 are listed floodplain wetlands, 423 are registered and remaining 969 are unregistered. However total wetland in the Goalpara district is 33221 hectares that includes 151 small wetlands (<2.25 ha). River/ streams occupies 84.77% of wetlands. Other major wetland types is waterlogged (7.1%) and lake/pond (7.0%). There are 44 lake/ponds (locally called as beels) with 2339 ha area. ox-bow lakes occupied 195 ha area(0.59%) (NWIA Assam Atlas, 2010) [8]. Wetlands exhibit enormous diversity according to their genesis, geographical location, water regime and chemistry, dominant plants and soil or sediment characteristics. Situated on the East of Goalpara district, nearest to Rangjuli town is a large wetland called Choutra Naitara beel. There are 4 villages surrounding the wetland. Besides providing water for cultivation in the nearby agricultural land this wetland is also home to many species of aquatic plants, fishes, insects, and birds.

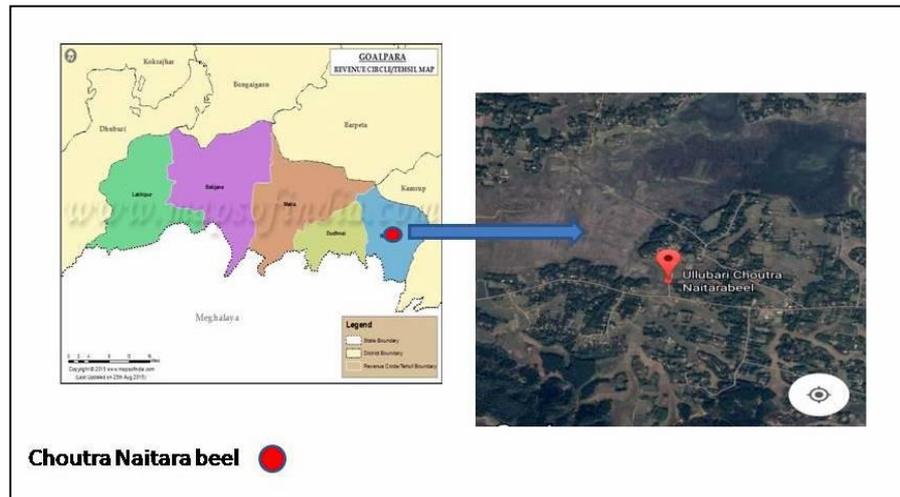
Different workers also studied the beels of Assam and reported the fish diversity of lower Assam. Goswami *et al.* (2012) reported 422 species under 133 genera and 38 families from Northeast India. Dutta (2000) reported 43 species of 17 families having export values from plains of Assam. Goswami (2007) [4] Viswanath (2007) [4], Jayaram (2007) [4] and Dutta (2007) [4] studied natural and Anthropogenic Hazards of Fish fauna of Northeast India.

Das *et al.* (2015) [3] recorded 37 species under 27 orders and 17 families from urpod beel, hasila beel, kumri beel, seksekia beel and sidli beel of Goalpara district. Since, it is one of the registered beel of Goalpara district of Assam and yet no information is much available from fishery point of view. Keeping this in mind the study has been undertaken to document the ichthyofaunal diversity of the Choutra Naitara beel and to highlight the current anthropogenic stress of the wetland.

2. Materials and Methods

2.1 Study Area: The district of Goalpara holds a unique position amidst complex of Geological and physical

makeup. This beel is located on the East of Goalpara district in Assam. Its geographical location falls under Latitude 26°50' N and Longitude 90° 27' E, under Goalpara sub-division, nearest to Rangjuli town. The total area of the beel is recorded to be 220. ha (District Census Handbook_1981) [2]. The locational map of the studied area is depicted on fig 1. The beel lies on the south bank of Brahmaputra river and falls under tropical monsoon climate. The nearby villages to the beel are Tiplai, Ullubari, Gorsutka and Panibari. Jaljali stream is the connecting link to the wetland. This wetland is drained by two rivers, namely Kornoj and Juria coming out from the East Garo Hills of Meghalaya. Planktons, Benthos, and Macrophytes are dominant in the wetland.



(Source: www.googlemap)

Fig 1: Locational Map of the Choutra Naitara wetland

2.2 Data Collection and Analysis

The survey was carried out from Feb 2016 to May-2017 on the Choutra Naitara wetland of Goalpara district. The fish diversity in the wetland was examined by using two methods through spot verification on the beel itself and through questionnaire to the fishermen of the wetland having years of experience. Fishing gears mainly used were gill nets locally called Phasi or Lungi jal is widely used and chaki or chak jal, a conical shaped net 1.5-3.0 m wide is widely used. Drag nets were used on those areas where macrophytes were moderately infested. The species which could not be identified on the spot were brought to the laboratory and these were identified by using different keys of various standard literatures and Morphometrics study of the fishes following Talwar and Jhingran (1991) [7], Jayaram (2013) [6]. Photographs were taken on the spots. Later fishes were preserved in 5% formalin. The conservation status was evaluated based on IUCN status (2017-2).

3. Result and Discussion

A total of 50 species belonging to 38 Genera, 8 orders and 21 Families have been recorded from the wetland. Among these, 5 species were nearly threatened (NT), 1 species vulnerable (VU), 42 species were least concern (LC) and 2 data deficient (DD). Conservation status is evaluated based on IUCN data (2017-2). The species recorded during this survey is listed in Table 1. Out of 8 recorded orders, Perciformes contributed 07 families, followed by Siluriformes 06, Cypriniformes and Synbranchiformes each with 02, Osteoglossiformes, Clupeiformes, Beloniformes and Tetraodontiformes each with 01 families respectively.

Among families Cyprinidae is highly dominant representing 17 individual fish species, followed by Bagridae 06. Jhingran, (1991) [7, 12] reported 16 exotic fish species from India and in the present study site 3 exotic Carps i.e. *Cyprinus carpio*, *Ctenopharyngodon idella*, and *Hypthalmichthys molitrix* were recorded. Sarma *et al.* (2007) reported 70 commercially important fish species from the lower reaches of Brahmaputra river. Commercially important species with high overseas demand are recorded such as *Esomus danricus*, *Tetraodon cutcutia*, *Xenentodon cancila*, *Pethia ticto*, *Puntius chola*, *Mystus vittatus*, *Nandus nandus*, *Anabas testidunius*, *T. fasciatus*, *Botia derio*, *Sperata aor*, *Mystus tengera*, *Ambassis nama*, *Parambassis ranga*, *Notopterus notopterus*, *chitala chitala* etc. Air breathing fishes such as *Clarias magur*, *Heteropneustes fossilis*, *Channa spp.* and *Mastcembelus armatus* fetch high market value as live fish. Many of these fish species have potential value as food and ornamental. Once dominant in this wetland fishes like *Channa striatus*, *Wallago attu*, *Xenentodon cancila*, *Notopterus chitala*, *Ompok pabo* etc are now at diminishing condition. Fishing is an indigenous method practiced by the villagers during winter. The fishing economy of the Choutra Naitara beel is controlled by fisherman of the locality and mahalders. People of the fringe area specially Naitar beel village, Ullubari village constitute low income group people whose main occupation is fishing, so over fishing in the wetland is practiced at high rate. Approximately around 200-250 boats are engaged daily. The intensity of over fishing has led to eutrophication. Increase in population in the nearby places of the wetland have resulted in illegal settlement reducing

the total area of the beel. Enchroachment during last few year is very high. During winter in the shallow areas of the wetland, the cultivation of Boro rice is being practiced which have converted much area of the wetland into fields. As per the local people schedule caste and Muslim farmer are more interested in agricultural activities during winter as

the production of fishes remains low. The fact that pesticides use in paddy cultivation has been posing a serious threats to fishes and other aquatic habitat of the wetland which confirms that this wetland is now entangled with varied anthropogenic pressure.

Table 1: Fish species recorded in the Choutra Naitara Wetland of Goalpara district.

Sl.no.	Local name	Scientific name	Family	Conservation status : IUCN Ver 3.1(2017-2)
Order: I. Osteoglossiformes				
01	Chital	<i>Chitala chitala</i> (Pallas)	Notopteridae	NT
02	kandhuli	<i>Notopterus notopterus</i> (Ham.-Buch.)	Do-	LC
Order: II. Clupeiformes				
03	Karoti	<i>Gudusia chapra</i> (Ham.-Buch.)	Clupeidae	LC
Order: III. Cypriniformes				
04	Boriala	<i>Aspidoparia jaya</i> (Ham).	Cyprinidae	LC
05	Boriala	<i>Cabdio morar</i> (Ham.-Buch.)	Do-	LC
06	Moa	<i>Amblypharingodon mola</i> (Ham.-Buch)	Do-	LC
07	Mirika	<i>Cirrhinus mrigala</i> (Ham.-Buch)	Do-	LC
08	Lachim bhangone	<i>Cirrhinus reba</i> (Ham.-Buch.)	Do-	LC
09	Catla	<i>Catla catla</i> (Ham.-Buch.)	Do-	LC
10	Common carp	<i>Cyprinus carpio</i> (Linnaeus, 1758)	Do-	VU
11	Dorkina	<i>Esomus danricus</i> (Ham.-Buch.)	Do-	LC
12	Bhangone	<i>Labeo bata</i> (Ham.-Buch.)	Do-	LC
13	Kurhi	<i>Labeo gonius</i> (Ham.-Buch.)	Do-	LC
14	Rau	<i>Labeo rohita</i> (Ham.-Buch.)	Do-	LC
15	Mali.	<i>Labeo calbasu</i> (Ham.Buch.)	Do-	LC
16	Grass carp	<i>Ctenopharyngodon idella</i> (Valenciennes, 1844)	Do-	DD
17	Puthi	<i>Puntius chola</i> (Bleeker)	Do-	LC
18	Puthi	<i>Puntius sophore</i> (HamBuch)	Do-	LC
19	Puthi	<i>Pethia ticto</i> (Ham.-Buch.)	Do-	LC
20	Silver carp	<i>Hypophthalmichthys molitrix</i> (Valenciennes, 1844)	Do-	NT
21	Rani Botia	<i>Botia Dario</i> (Ham.-Buch)	Cobitidae	LC
Order: V. Siluriformes				
22	Tengra	<i>Mystus bleekeri</i> (Day)	Bagridae	LC
23	Tengera	<i>Mystus tengera</i> (Ham.-Buch.)	Do-	LC
24	Tengera	<i>Mystus vittatus</i> (Bloch)	Do-	LC
25	Ritha	<i>Rita rita</i> (Ham.-Buch.)	Do-	LC
26	Arii	<i>Sperata aor</i> (Ham.-Buch.)	Do-	LC
27	Arii	<i>Sperata seenghala</i> (Sykes)	Do-	LC
28	Borali	<i>Wallagu attu</i> (Schneider)	Siluridae	NT
29	Pabho	<i>Ompok pabo</i> (Ham-1822)	Do-	NT
30	Kajoli	<i>Ailia coila</i> (Ham.-Buch.)	Schilbeidae	NT
31	Magur	<i>Clarius magur</i> (Linnaeus)	Clariidae	LC
32	Singi	<i>Heteropneustes fossilis</i> (Bloch)	Heteropneustidae	LC
33	Chaka	<i>Chaca chaca</i> (Ham.-Buch.)	Chacidae	LC
Order: VI. Beloniformes				
34	Kokila	<i>Xenentodon cancilla</i> (Ham.Buch.)	Belonidae	LC
Order VII. Synbranchiformes				
35	Cuchia	<i>Monopterusuchia</i> (Ham.-Buch.)	Synbranchidae	LC
36	Turi	<i>Macrogathus aral</i> (Bloch & Schneider)	Mastacembelidae	LC
37	Turi	<i>M. pancalus</i> (Ham-Buch)	Do-	LC
38	Bami	<i>Mastacembalus armatus.</i> (Lacepede)	Do-	LC
Order VIII. Perciformes				
39	Chanda	<i>Ambassis nama</i> (Ham.-Buch.)	Ambassidae	LC
40	Chanda	<i>Parambassis ranga</i> (Ham.-Buch.)	Do-	LC
41	Dum vacheli	<i>Badis badis</i> (Ham.-Buch.)	Badidae	LC
42	Bhetki/Ajoli	<i>Nandus nandus</i> (Ham.)	Nanidae	LC
43	Patimutura	<i>Glossogobius giuris</i> (Ham.-Buch.)	Gobiidae	LC
44	Koi	<i>Anabas testudinius</i> (Bloch)	Anabantidae	DD
45	Kholisa	<i>Trichogaster fasciata</i> (Schneider)	Osphronemidae	LC
46	Lal kholisa	<i>Trichogaster lalius</i> (Ham.-Buch.)	Do-	LC
47	Goroi	<i>Channa punctatus</i> (Bloch)	Channidae	LC
48	Shol	<i>Channa striatus</i> (Bloch)	Do -	LC
49	Cheng	<i>Channa gachua</i> (Ham.-Buch.)	Do-	LC
Order IX. Tetraodontiformes				
50	Tepa	<i>Tetraodon cutcutia</i> (Ham.-Buch.)	Tetraodontidae	LC

Note:

Conservation status:

IUCN (2017-2) shows: LC = Least concern, VU= Vulnerable, NT= Nearly Threatened, DD= Data deficient.

4. Conclusion

The result of the study indicates that the Choutra Naitara beel of Goalpara district is a wetland with rich fish species diversity which is right now entangled in varied pressures, such as Anthropogenic cause. However, strategies such as controlled harvest, checks on growth of exotic species, controlling water pollution and awareness programme is needed to educate people about the importance of the wetland, its biodiversity and fish productivity. So it is the need of the hour to conserve the fishes in their native environment for sustainable fisheries development.

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