



## PRESENT STATUS OF ICHTHYOFAUNAL DIVERSITY OF BARNADI RIVER, DARRANG DISTRICT, ASSAM, INDIA

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**Abstract:** The basin of the Barnadi river covers an area of 680.97 square km between the parallels of 26°14'30" N and 26°49'17" N latitudes and the meridians 91°44'40" E and 91°53'15" E longitudes having a total population of 3,03,229 persons scattered over 290 villages consisting of 66,731 households (2011 census). The present investigation was carried out in the upstream region of Barnadi river during the 2021-22 to document the ichthyofaunal diversity and the result reveals the presence of 40 fish species recorded from Barnadi river belonging to 33 genera under 7 orders and 19 families from two different sites of the river. Among these 40 species, 4 species were nearly threatened (NT), 35 species were least concern (LC), and 1 data deficient (DD). Barnadi river is playing an important role for the livelihood by producing animal protein and enhance socioeconomic condition for the local people.

**Index Terms -** Basin, ichthyofaunal diversity, livelihood, socioeconomic.

### I. INTRODUCTION

Fishes are an important resource worldwide, especially as food commercial and subsistence fishers hunt fish in wild fisheries or farm them in ponds or in cages in the ocean. They are also caught by recreational fishers, kept as pets, raised by fish keepers, and exhibited in public aquaria. Fish have had a role in culture through the ages, serving as deities, religious symbols and as the subjects of art, books and movies. Although we recognize the value of our dependency upon fishes, threats to the integrity of the environment pose a serious problem for their existence. It is desirable to maintain the diversity and systematise can play a leading role in protecting their diversity (Nelson, 1994). Fishes are abundant in most bodies of water. They can be found in nearly all aquatic environments, from high mountain streams e.g., char and gudgeon, to the abyssal and even hadal zone of the deepest ocean. Nelson (1994) estimated 27,977 valid species of fishes under 62 orders, 515 families and 4,494 genera, and the eventual number of extant fish species was projected to be close to 32,500. About 11,952 species or 42.72% normally live in freshwater lakes and rivers that cover only 1% of the earth's surface and account for a little less than 0.01% of its water. The secondary freshwater species number 12,457 and the remaining 3,568 species are exclusively marine. The Barnadi River basin, mastered by the river Barnadi, is one of the major northern tributary river basins of the Brahmaputra Valley in Assam. The Barnadi and its tributaries namely, the Kalpani, Dimila, Ranganoi etc. along with some wetlands like Ken, Dipling, Bodiasisha etc. cover the part of the present Udalguri and Darrang districts in the east and a northern part of the Baksa and Kamrup districts in the west of the river (Sarma, 1994). The Barnadi river itself represents the present political boundary between the present Udalguri and Darrang district (formerly Darrang District) and the present Baksa district and northern part of Kamrup district. The aim of the study is to document the ichthyo-faunal diversity in the upstream region of the Barnadi river with its feeding habitat, economic importance and conservation status.

### II. MATERIALS AND METHODOLOGY

#### 2.1. Study area

The study area is the "Barnadi river", one of the major northern tributary river basins of the Brahmaputra Valley in Assam. The part of the river that was taken for study is located in the Indo-Bhutan border in a place called Bogamati which lies in the newly created Baksa district in Assam. This tributary river system of the Brahmaputra originates from the "RangaNoi Stream" on the northern foothills of the Bhutan Himalaya at an altitude of 350 m above mean sea level and flowing for about 205 km from north to south it meets the Brahmaputra at the place "Rohinimukh" near North Guwahati. After traversing to south a distance of 9.5 km in Bhutan the river enters into the district of present Udalguri (previously the Udalguri subdivision of the district of Darrang) district of Assam at an elevation of 274.32 m above the mean sea level. The Barnadi river for its most part at least in the part of Dumnichowki (at the crossing point with the National Highway No. 52) passes over a fault lying below 200 feet below the surface (Rao, 1979). The basin of the river covers an area of 680.97 square km between the parallels of 26°14'30" N and 26°49'17" N latitudes and the meridians 91°44'40" E and 91°53'15" E longitudes. On this tributary basin there exist people of

different castes, communities, creed and cultural traits with a total population of 3,03,229 persons scattered over 290 villages consisting of 66,731 households (2011 census).



Fig.1: Locational map of study area (source: Google map).

## 2.2. Data collection, identification and preservation

The present work was carried out during 2021-22 in two sites i.e. site A and site B of the Barnadi river situated near Bogamati picnic spot and markets. The primary data are collected from survey of the aqua bodies of the study area and various data and information were collected by physical verification and secondary data through interview with the local fishermen of the study area with prepared questionnaire. Fish samples were collected with the help of local skilled fishermen through experimental fishing using a variety of nets and traps. Fishes caught alive or in fresh condition and have been preserved at first in concentrated formaldehyde in the field itself and then in 4% formalin. The fish Specimen were identified following the literature of Talwar and Jhingran (1991) and Jayaram (2010). Photographs were taken on the spots. The conservation status was evaluated based on IUCN status (2017.2).

## III. RESULTS AND DISCUSSION

The study reveals 40 fish species recorded from Barnadi river belonging to 33 genera under 7 orders and 19 families from two different sites of the river. Out of 40 fish species 28 species of fishes have been found in site A while 32 species of fishes were reported from site B. with 20 numbers of fish species belongs to both the site A and B. It has also been observed that Cyprinidae is the most dominant family contributing about 31.42% of total recorded family, that includes 13 species followed by Cobitidae with 3 species holding a share of 8.5%. The third highest dominancy is, however, contributed by Bagridae, Channidae, Nandidae, Mastacembelidae, Schilbeidae, Ambassidae each comprising about 5.7%. The fourth dominancy is contributed by Osphronemidae, Cichlidae, Clariidae, Tetraodontidae, Notopteridae, Heteropneustidae, Belontiidae, Gobiidae, Siluridae, Anabantidae with 2.8% each. Among these 40 species, 4 species were nearly threatened (NT), 35 species were least concern (LC), and 1 data deficient (DD). Conservation status is evaluated based on IUCN data (2017.2).

The feeding habit of the identified fishes were categories as larvivorous (LV), carnivorous fish (CF), herbivorous fish (HF), Omnivorous fish (OF), Predatory fish (PD), Plankton feeder (PF) fish. Out of 40 species recorded from the Barnadi river, Omnivorous species has been found maximum (18) followed by carnivorous (16), larvivorous 8, predatory 5, herbivorous 4 and plankton feeder 3. The occurrence of fishes based on feeding habit has been presented on site A and site B.

Out of the 40 species recorded, 11 species were found to be of commercial importance, 31 species have food value and 6 species are classified as coarse food fishes. 10 species are suitable for aquarium, while 9 have medicinal use, and some others are of larvivorous whereas some are useful as bait. Similar type of results were also reported by Rao *et al.* (1998), Sakhare (2001), and Kadam and Gayakwad (2006) in Mehadrigedda, Jawalgaon and Masooli reservoir respectively.

Certain factors influence the diversity and abundance of fishes in the different fresh water systems of Assam. However the fishermen community cannot use Bammadi river for over fishing purpose as it is under the surveillance of Barnadi wildlife sanctuary. In the board of the sanctuary that together with hunting in the sanctuary, fishing is also illegal, but still some local fishermen and villagers are seen fishing there on a regular basis for their livelihood purpose Biswajit Kumar Acharjee, Madhurima Das, Papari Borah and Jayaditya Purkayastha have recorded the presence of thirty four (34) species of fishes belonging to five (5) orders, thirteen (13) families and twenty four (24) genera in Dhansiri river. So far as the Ichthyofaunal diversity is concerned during the study by Sharmistha Chakraborty, Arvind Kumar Goyal and Birendra Kumar Brahma, 77 ichthyospecies belonging to 33 genera, 26 families and 9 orders have been recorded from the different water bodies of Kokrajhar District of BTAD, Assam, India and which is higher than present results.

Table.1: Fish fauna, feeding habits, economic importance and conservation status of fish species of Barnadi river.

Sl. no	Order	Family	Scientific name	Site A	Site B	Feeding habit	Economic importance	Conservation status : IUCN	
1	Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i> (Pallas, 1769)	+	+	LV	CO,CF, MV,LV	LC	
2	Cypriniformes	Cyprinidae	<i>Amblypharyngodon mola</i> (Hamilton, 1822)	-	+	HF,PF	FF,CO	LC	
3			<i>Cabdio morar</i> (Hamilton, 1822)	+	+	OF	FF	LC	
4			<i>Cirrhinus mrigala</i> (Hamilton, 1822)	+	+	OF	FF,CO	LC	
5			<i>Esomus danricus</i> (Hamilton, 1822)	+	-	CF,OF	FF, BT	LC	
6			<i>Labeo bata</i> (Hamilton, 1822)	+	-	HF	FF	LC	
7			<i>Labeo gonius</i> (Hamilton, 1822)	+	+	HF	CF	LC	
8			<i>Puntius sophore</i> (Hamilton, 1822)	-	+	LV,OF	CF,AF, BT,MV, LV	LC	
9			<i>Puntius javanicus</i> (Bleeker, 1855)	+	+	OF, LV	FF, LV	LC	
10			<i>Pethia ticto</i> (Hamilton, 1822)	-	+	OF,PF	FF, MV	LC	
11			<i>Osteobrama cotio</i> (Hamilton, 1822)	+	+	OF	FF,LV	LC	
12			<i>Danio devario</i> (Hamilton, 1822)	-	+	LV	FF, AF	LC	
13			<i>Barilius barila</i> (Hamilton, 1822)	+	+	CF	CO	LC	
14			<i>Gonorrhynchus latius</i> (Hamilton, 1822)	+	-	HF	AF	LC	
15			Cobitidae		<i>Botia dario</i> (Hamilton, 1822)	+	+	OF,CF	FF,AF
16	<i>Lepidocephalichthys guntea</i> (Hamilton, 1822)	+			+	PD	FF,CO, AF	LC	
17	<i>Canthophrys gongota</i> (Hamilton, 1822)	+			+	LV	AF, MV	LC	
18	Siluriformes	Bagridae	<i>Mystus cavasius</i> (Hamilton, 1822)	-	+	CF	FF, MV	LC	
19			<i>Mystus vittatus</i> (Bloch, 1794)	+	+	OF,PF	FF, CO	LC	
20			<i>Mystus tengara</i> (Hamilton, 1822)	-	+	CF	FF, MV	LC	
21		Schilbeidae	<i>Ailia coila</i> (Hamilton, 1822)	+	+	CF	FF	NT	
22			<i>Eutropiichthys vacha</i> (Hamilton, 1822)	+	+	CF	FF	LC	
23		Sisoridae		<i>Gagata cenia</i> (Hamilton,1822)	-	+	CF	FF	LC
24		Heteropneustidae		<i>Heteropneustes fossilis</i> (Bloch, 1794)	+	-	CF	FF,MV	LC
25		Siluridae		<i>Ompok pabo</i> (Hamilton, 1822)	+	+	CF,PD	FF	NT
26		Clariidae		<i>Clarias magur</i> (Linnaeus,1758)	+	+	OF	CO, FF, CF	LC
27		Beloniformes	Belonidae	<i>Xenentodon cancila</i> (Hamilton, 1822)	-	+	CF	MV	LC
28	Synbranchiformes	Mastacembelidae	<i>Macrognathus aral</i> (Bloch & Schneider, 1801)	+	-	OF	FF,LV	LC	
29			<i>Macrognathus pancalus</i>	+	+	OF, PD	FF	LC	

			(Hamilton, 1822)					
30	Perciformes	Ambassidae	<i>Chanda nama</i> (Hamilton, 1822)	-	+	CF	FF, MV	LC
31			<i>Parabassis ranga</i> (Hamilton, 1822)	-	+	OF	FF	LC
32		Nandidae	<i>Badis badis</i> (Hamilton, 1822)	-	+	OF, LV	AF	LC
33			<i>Nandus nandus</i> (Hamilton, 1822)	+	+	CF,PD	FF,AF	LC
34		Gobiidae	<i>Glossogobius giuris</i> (Hamilton, 1822)	+	-	CF	FF,CO	LC
35		Anabantidae	<i>Anabas testudineus</i> (Bloch, 1793)	+	+	OF,CF	FF,CO	DD
36		Osphronemidae	<i>Trichogaster fasciata</i> (Bloch and Schneider, 1801)	+	+	LV,OF	FF,BT	LC
37		Cichlidae	<i>Oreochromis mossambica</i> (W.K.H. Peters, 1852)	-	+	OF	CO,CF, FF,AF	NT
38		Channidae	<i>Channa gachua</i> (Hamilton, 1822)	+	+	CF	FF	LC
39			<i>Channa punctatus</i> (Bloch, 1793)	+	-	LV	FF,CO	LC
40	Tetraodontiformes	Tetraodontidae	<i>Tetraodon cutcutia</i> (Hamilton, 1822)	+	-	OF, PD	CF,AF	NT

N.B: HF - Herbivorous fish, OF - Omnivorous fish, CF - Carnivorous fish, PD -Predatory fish, PF -Plankton feeder, CF - Coarse food, FF- Food fish, CO - Commercial food, LV- Larvivorous, MV-Medicinal value, AF -Aquarium fish, BT- Bait fish. LC- Least Concern, DD- Data Deficiency, NT-Near Threatened, '+': Present and '-': Absent.

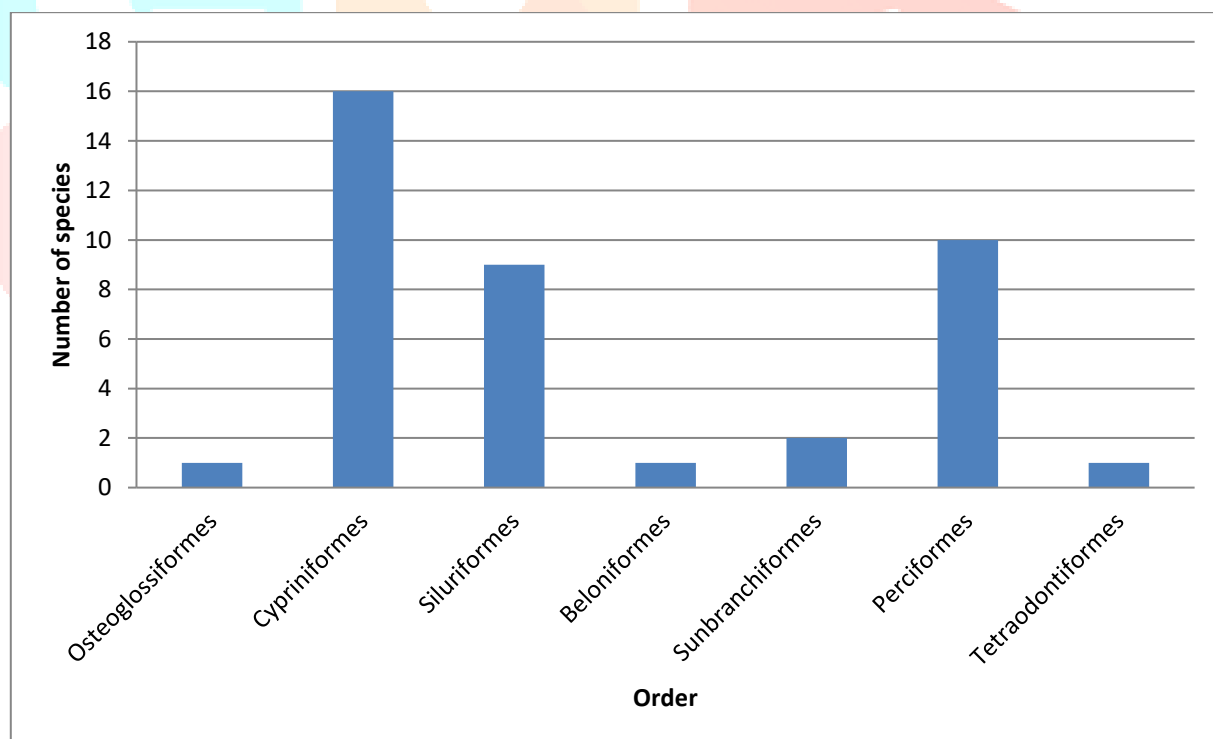


Fig.2: Number of species of Barnadi river on the basis of order.

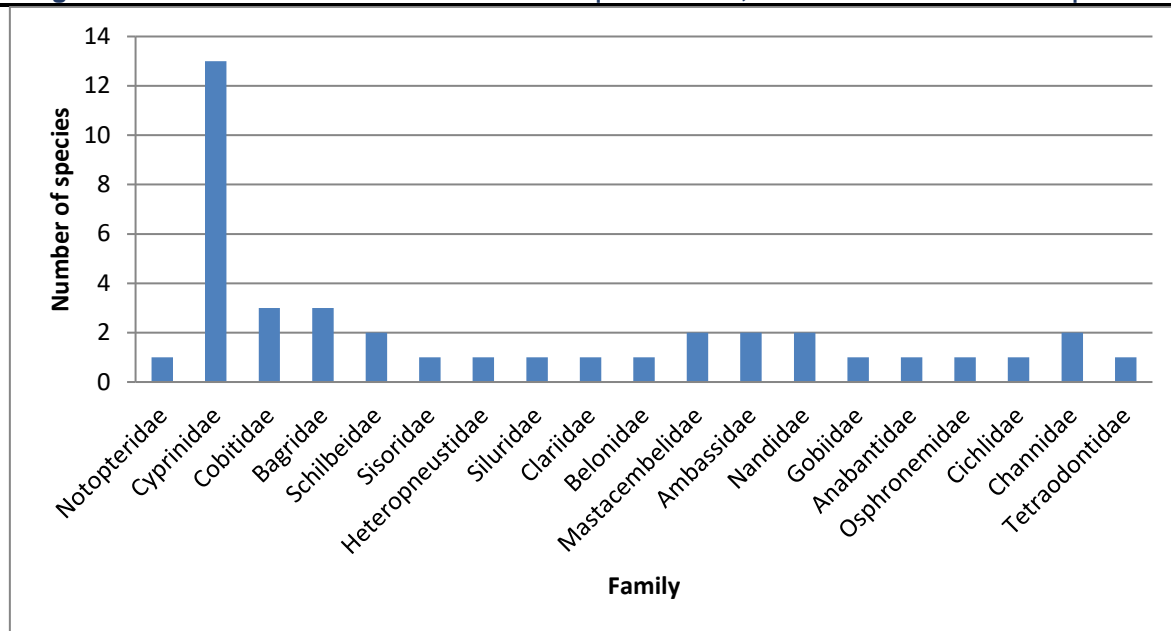


Fig.3: Number of species of Barnadi river on the basis of family.

#### IV. CONCLUSION

The Barmadi river is rich for ichthyofaunal species diversity of Assam. Due to the natural hazards i.e flood, erosion and anthropogenic factors like over fishing, destructive fishing etc diversity of fishes have been decreasing. So, the water bodies should be protected and management measures should be adopted for the sustainable development of the ecosystem.

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