



Biodiversity and Conservation status of Ichthyofauna of Doria beel, Majuli, India

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Abstract

The Doria beel lies in the geographical ordinates between 26°57'30.58 N latitude and 94°10.02.36'E longitude with elevation 277ft. A survey was conducted on diversity of fish fauna of the Doria beel from January 2011 to December, 2012. Fish samples were collected from various stations of the fish landing site of the study area. During our study period we were encountered 55 species belonging to 7 orders and 19 families. Maximum diversity is observed in the family Cyprinidae which represents 18 species (32.72%) followed by Channidae 6 species, Belontiidae and Chacidae each 4 species (7.27 %), Chandidae and Siluridae each 3 species (5.45 %), Cobitidae, Nandidae, Notopteridae and Mastercembelidae each 2 species (3.63 %), Anguillidae, Anabantidae, Heteropneustidae, Gobiidae, Synbranchidae, Siluridae, Claridae, Schilbeidae, Chacidae and Tetradontidae each 1 species (1.81%). According to IUCN red list category, out of 55 species, 41.8 % species are not evaluated (NE), 36.36 % species are least concern (LC), 10.9 % species are near threatened (NT), 5.45 % species are vulnerable (VU), 3.63 % lower risk near threatened (LRnt) and 1.81% species data deficient (DD)

Keywords: Iucn, least concern, Majuli, red list, vulnerable, beel.

Introduction

Biologically, freshwater wetlands are the richest and most interesting ecosystem. They support a diverse community with a rich diversity of life. The northeast India one of the hot spots of biodiversity out of 34 Hot spots of the world¹⁻³. The geomorphology of the North East region of India consists of hills, plains, rivers, wetlands and swamps which contribute for rich diversity. Though the region is rich in biodiversity but many endemic and rare species including fish fauna are now anthropogenic pressure. Many species are verge of extinction. Many fresh water fishes are illegally exported from the wild. Beels constitute vitally important resources of Assam. The Brahmaputra and the Barak River along with its tributaries creates a large area of flood plain. More than one thousands wetlands are available in Assam covering more than 1, 00000 ha. Wetlands are a source of subsistence and livelihood of thousands of people though fishing, collection of edible plants, agriculture, water transport and irrigation. Such water bodies attraction of migratory birds, resident water fowls and supports a rich floral and faunistic diversity in the form of plankton, macrophytes, insect and other macrophytes –associated fauna as well as a rich variety of air-breathing and small sized fishes, some of which are threatened ones. The wetlands have tremendous potential for development of the aquaculture industries in this region. There are 155 small and large wetlands present in the island of Majuli. Doria beel is an important from economic point of view. Many rural people of Majuli enjoy their livelihood in the beel. Economy of poor people of this

region depends on the wetlands. The present study focuses on the status and diversity of the freshwater fish species of the Doria beel of the Island Majuli. The study also highlights the unique assemblage of the aquatic biota, threatened and endemic species is not only a global priority for conservation, but also determines the distribution of the aquatic diversity the region. The region is distinctive in having certain endemic species of fishes, viz. *Badis badis*, *Chaca chaca*, *Ompok pabo*, *Channa barca*, *Tor putitora*, *Tor tor* and *Chitala chitala*. Wetlands are locally known as beel in Assam. Many workers studied the beel ecosystem of Assam out of that most significant contributors in this field were those of Hamilton⁵, Agarwala⁶ Biswas and Boruah⁷, Bordoloi⁸ in closed and open type wetlands of Jorhat district, Bera et al.⁹, Singh et al.¹⁰, Dakua et al.¹¹, Abujam et al.^{12,13}, Hussain and Biswas¹⁴ in wetland of Dhamaji, Bordoloi^{15,16} and Paswan G¹⁷ in Potiasola wetlands of Jorhat district and Yadava Y.S. et al¹⁸ in Borsola wetland.

Material and Methods

Total no of fish species present in this region still not confirmed. Ghosh and Lipton¹⁹ recorded 132 species, Sen²⁰ and Mahanta²¹ listed 183 fish species from Assam and the neighbouring North Eastern state. Sinha²² his comprehensive review prepared a list of 230 fishes available in the North Eastern region, Nath and Dey²³ recorded a total of 131 species from the drainages of Arunacha Pradesh, Sen²⁴ documented 267 species from North East India. The various reports show a wide variation in the total number of species reported. NBFGR²⁵ documented 200

ichthyofauna in Assam, followed by 169 species in the Arunachal Pradesh, 165 species in the Meghalaya, 134 species in the Tripura, 121 species in the Manipur, 68 species in the Nagaland and 48 species in the Mizoram. Recently, Goswami⁴ listed 422 fish species from north east India, belonging to 133 genera and 38 families. North eastern region of India contains more than 62.81% of total freshwater fish available in the country, as against the 667 freshwater species reported.

Study Area: The Doria beel of Jorhat district lies in the geographical ordinates between 26°57'30.58 N latitude and 94°10.02.36'E longitude with elevation 277ft. Area of the beel is about 4 ha. About 20 % surface area is occupied by aquatic weeds. Every year the beel is flash out by flood water. The beel has been connection with some others channel of Brahmaputra River.

Sampling: Investigation was pursued from January 2011 to December, 2012. Fish samples were done monthly basis at the time of catch of fishes in the beel. Fish samples were preserved in 5% formalin for further investigation. The individual species was weighted and recorded after collection. The fish species were identification and systematic arrangement were followed after Talwar and Jhingran²⁶, Jayaram²⁷ and Vishwanath²⁸. Information was collected from individual fishermen²⁹ and also with the help of local fishermen and Mohalder having more than 25 years fishing experiences.

Results and Discussion

Result are summarised in the table-1, 2 and 3 and figure-1. During study period we noticed 19 families which contribute 55 species. Maximum diversity is observed in the family Cyprinidae which represents 18 species (32.72%) followed by Channidae 6 species (10.9%), Belontiidae and Chacidae each 4 species (7.27%), Chandidae and Siluridae each 3 species (5.45%), Cobitidae, Nandidae, Notopteridae and Mastercembelidae each 2 species (3.63%), Anguillidae, Anabantidae, Heteropneustidae, Gobiidae, Synbranchidae, Siluridae, Claridae, Schilbeidae, Chacidae and Tetrodontidae each 1 species (1.81%).

Cypriniformes was most dominant group with 18 species but Anguillidae, Anabantidae, Heteropneustidae, Gobiidae, Synbranchidae, Siluridae, Claridae, Schilbeidae, Chacidae and Tetrodontidae each represented 1 species. Such findings were supported by Singh¹⁰, Dukua¹¹, Bordoloi⁸ and Abujam¹³, Bordoloi^{15,16} and Goswami et al.⁴ Cyprinidae contributes¹⁸ species such as *Amblypharyngodon mola*⁵, *Cirrhinus mrigala*⁵, *Cirrhinus reba*, *Labeo bata*, *Labeo gonius*⁵, *Labeo rohita*, *Puntius chola*⁵, *Puntius sophore*⁵, *Puntius ticto*⁵, *Puntius conchoni*, *Rasbora daniconius*, *Cyprinus carpio carpio*, *Ctenopharyngodon idella*, *Hypophthalmichthys molitris*, *Catla catla*, *Labeo calbasu*, *Labeo rohita*, and *Puntius javanicus*.

Out of 55 species 45 species have ornamental value in abroad. Important ornamental species are *Puntius chola*⁵, *Puntius sophore*⁵, *Puntius ticto*⁵, *Puntius conchoni*, *Rasbora daniconius*, *Chaca chaca*, *Ompok bimaculatus*, *Ompok pabda*, *Ompok pabo*, *Channa barca*, *Anguilla bengalensis*, *Notopterus notopterus*, *Channa speces* etc.

Channa orientalis, *Anabus testudineus*⁵, *Clarius batrachu*, *Channa gachua*, *Chana. marulius*, *Channa punctatus*, *Channa stewartii* and *Channa Striatus*, are well known to all as important natural medicine for welfare of human being. These indigenous species have good market value but due to anthropogenic as well as natural hazards decreasing their population. Construction of unplan embankment, over explored, complete pumping out of water of the beels and using unauthorised fishing gears have direct and indirect effect on aquatic biota. Natural hazards such as siltation and soil erosion³⁰ creating by Brahmaputra River are a serious matter. We suggest solving such problems as national problem for saving and sustainable development of aquatic biota of this region as a whole nation.

Appearance of 4 exotic species such as *Cyprinus carpio carpio*, *Ctenopharyngodon idella*, *Hypophthalmichthys molitris* and *Puntius javanicus* is a serious matter in this aquatic bodies as well as national problem. Introduction of such factors creating ecological disturbance for the native fish fauna with regard to their competition for food and space.

According to IUCN³¹ red list category, out of 55 species, 41.8 % species are species are not evaluated (NE), 36.36 % least concern (LC), 10.9 % species are near threatened (NT), 5.45 % species are vulnerable (VU), 3.63 % lower risk near threatened (LRnt) and 1.81% species data deficient (DD) are shown in the table-3 and figure-1.

Conclusion

Anthropogenic pressure, siltation on the bed of wetlands and soil erosion are the most important factor for fish decreasing fish population. Fast growing water hyacinth weed contributing to eutrophication by slowing down water currents and depositing debris at the bottom of the wellands. A number of fish species, such as are *Rasbora daniconius*, *Puntius ticto*, *Mystus microphtthalamus*, *Ompok bimaculatus*, *Ompok pabda*, *Ompok pabo*, *Chaca chaca*, *Eutropiichthys vocha*, *Channa barca*, *Tor putitora*, *Tor tor*, *Chitala chitala* and *Anguilla bengalensis* are on the verge of extinction.

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Table-1
Diversity of Ichthyofauna

Order	Family	Scientific Name	Local Name(Assamese)	IUCN
Anguilliformes	Anguillidae	<i>Anguilla bengalensis</i>	Bakas /nodal bami	NT
	Anabantidae	<i>Anabas testudineus</i>	Kaoi	NE
Perciformes	Belontiidae	<i>Trichogaster fasciata</i>	Kholihana	NE
		<i>Trichogaster sota</i>	Vacheli	NE
		<i>Trichogaster lalius</i>	Vacheli	NE
		<i>Trichogaster labiosa</i>	Kholihona	NE
Siluriformes	Bagridae	<i>Mystus cavasius</i>	Laluwa Singara	LC
		<i>Mystus tengara</i>	Singara	LC
		<i>Mystus vittatus</i>	Singara	LC
		<i>Aorichthys aor</i>	Ari	NE
Perciformes	Chandidae	<i>Chanda nama</i>	Chanda	LC
		<i>Parambassis ranga</i>	Chanda	LC
		<i>Parambassis lala</i>	Chanda	NT
	Channidae	<i>Channa marulius</i>	Goroi	NE
		<i>Channa punctatus</i>	Shoal	NE
		<i>Channa gachua</i>	Shengali	LC
		<i>Channa stewartii</i>	Shoal	NE
<i>Channa Striatus</i>	Shoal	NE		
<i>Channa orientalis</i>	Shoal	NE		
Cypriniformes	Cyprinidae	<i>Puntius sophore</i>	Puthi	LC
		<i>Puntius conchonius</i>	Puthi	
		<i>Cirrhinus mrigala</i>	Mirika	LC
		<i>Labeo bata.</i>	Bata	LRnt
		<i>Labeo gonius</i>	Kuhi	LC
		<i>Cyprinus carpio carpio</i>	Common carp	VU
		<i>Ctenopharyngodon idella</i>	Grass carp	NE
Cypriniformes	Cyprinidae	<i>Hypophthalmichthys molitris</i>	Silver carp	NE
		<i>Catla catla</i>	Bahu	NE

Order	Family	Scientific Name	Local Name(Assamese)	IUCN
		<i>Labeo. Calbasu</i>	Kaliajoha	LC
		<i>Labeo. Rohita</i>	Rohu	LC
		<i>Puntius javanicus</i>	Japani Puthi	NE
		<i>Cirrhinus reba</i>	Lachun bhangun	LC
		<i>Esomus danricus</i>	Darikona	NE
		<i>Rosbora daniconius</i>	Danikon	NE
		<i>Amblypharyngodon mola</i>	Moa	NE
		<i>Puntius chola</i>	Puthi	LC
		<i>Puntius ticto</i>	Chakari puth	LC
Siluriformes	Clariidae	<i>Clarius betrachus</i>	Magur	VU
	Chacidae	<i>Chaca chaca</i>	Kurkuri	LC
Crypriniformes	Cobitidae	<i>Lepidocephalus guntea</i>	Botia	LC
		<i>Botia doria</i>	Doria	NE
	Gobiidae	<i>Glossogobius giuris</i>	Patimutura	DD
Perciformes	Heteropneustidae	<i>Heteropneustes fossilis</i>	Singhi	VU
Synbranchiformes	Mastercembelidae	<i>Mastacembelus armatus</i>	Bami	LC
		<i>Macrognathus pancalus</i>	Tora	NE
Osteoglossiformes	Notopteridae	<i>Chitala chitala</i>	Chital	NT
		<i>Notopterus notopterus</i>	Kanduli	LC
Perciformes	Nandidae	<i>Badis badis</i>	Randhani	LC
		<i>Nandus nandus</i>	Gadgadi	LRnt
Synbranchiformes	Synbranchidae	<i>Monopterusuchia</i>	Cuchia	LC
Siluriformes	Siluridae	<i>Ompok bimaculatus</i>	Pabha	NT
		<i>Ompok pabda</i>	Pabha	NT
		<i>Ompok pabo</i>	Pabha	NT
	Schilbeidae	<i>Wallago attu</i>	Borali	NE
Tatradontiformes	Tetradontidae	<i>Tetradon cutcutia</i>	Gongatop	NE

EN- Endangered; VU-Vulnerable; LRnt-Lower risk near threatened; LRlc- Lower risk least concern, DD-Data deficient; LC-Least Concern ; NE- Not evaluated and NT - Near threatened

Table-2
Contribution of different order and families

Order	Family	No. of families	No. of species
Cypriniformes	Cyprinidae	1	18
	Cobitidae	1	2
Anguilliformes	Anguillidae	1	1
	Anabantidae	1	1
Perciformes	Belontiidae	1	4
	Chandidae	1	3
	Channidae	1	6
	Heteropneustidae	1	1
	Gobiidae	1	1
	Nandidae	1	2
Osteoglossiformes	Notopteridae	1	2
Synbranchiformes	Mastercembelidae	1	2
	Synbranchidae	1	1
Siluriformes	Siluridae	1	3
	Clarididae	1	1
	Schilbeidae	1	1
	Chacidae	1	1
	Bagridae	1	4
Tatradontiformes	Tetradontidae	1	1
Total		19	55

Table-3
Conservation status of species

Status	No. of species	%
Least concern (LC)	20	36.36
Not evaluated (NE)	23	41.83
Near threatened (NT)	6	10.9
Vulnerable(VU)	3	5.45
Lower risk near threatened (LRnt)	2	3.63
Data deficient (DD)	1	1.81

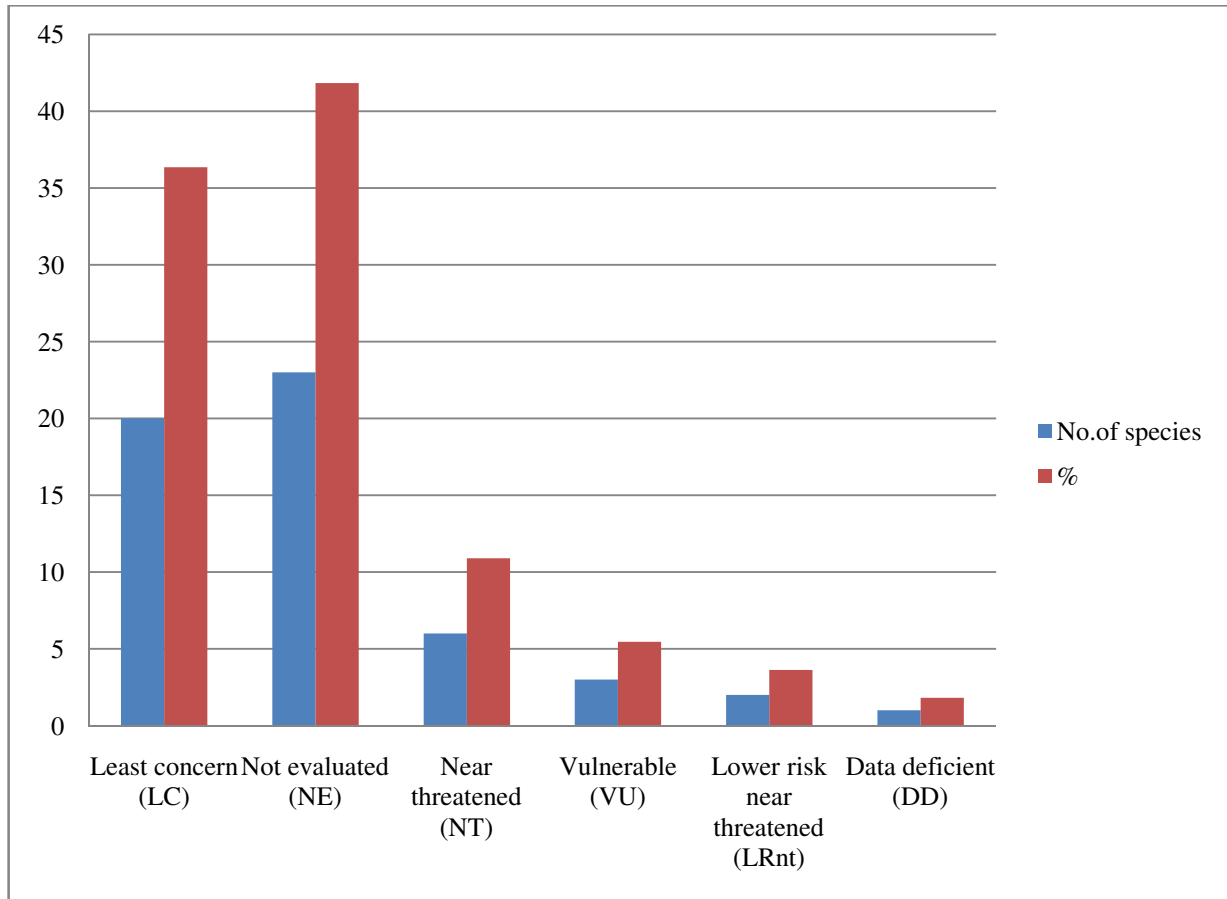


Figure-1
Status of Ichthyofauna



Figure-2
Satellite image of Majuli

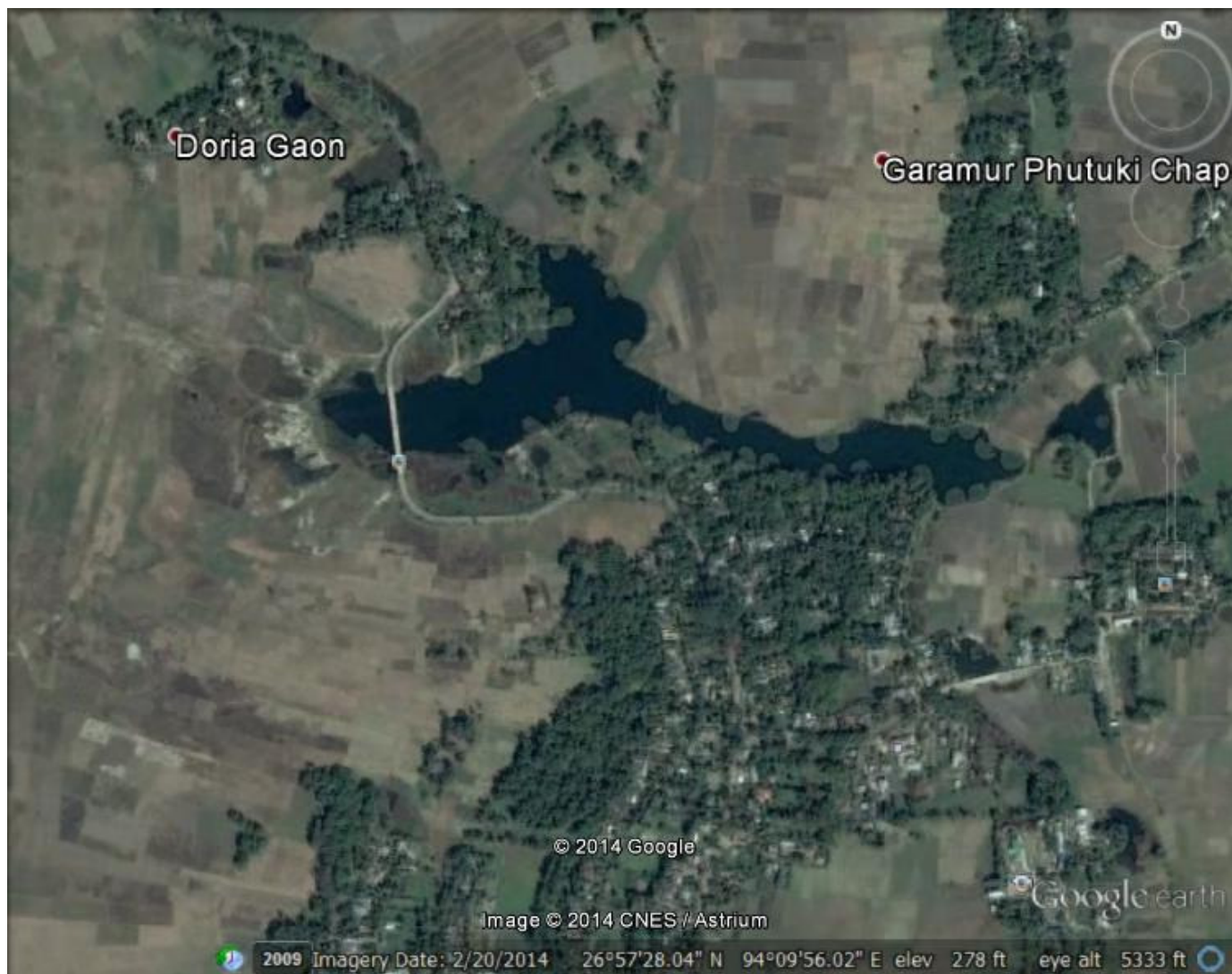


Figure-3
Satellite image of Doria beel

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