

Present status of threaten fish species in Dharla River of Bangladesh

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ABSTRACT

This study has been conducted to identify the threatened fish species and focus on fish biodiversity conservation in the Dharla River Lalmonirhat district. The present study was conducted for a time period of nine months (March-November, 2016). A total of 21 threatened fish species were identified in the river among them, 7 vulnerable, 11 endangered and 3 critically endangered species as well as 8 exotic fish species were found in the river. The fishing gears used by the fishermen in Dharla River includes 6 types of nets, 5 types of traps, 2 hooks and lines and 3 types of wounding gears whereas major fishing craft and gears were mainly wooden boat and seine net (locally called 'jhaki jal') respectively. Due to environmental degradation and manmade causes the biodiversity of this river decreasing day by day and it could be minimized by proper management and conservation techniques.

Introduction

Threatened species are any species which are vulnerable to endangerment in the near future. It includes Critically Endangered (CR), Endangered (EN) and Vulnerable (VU) categories. According to IUCN Bangladesh (2015a, b) two hundred fifty three Freshwater Fishes were assessed by IUCN Bangladesh. Threatened Categories are concerned nearly one fourth (64 species) of the species are under threat, among them 9 Critically Endangered, 30 Endangered, and 25 Vulnerable.

Fisheries sector play a very key role in national economy of Bangladesh. The major sources of fish are inland fisheries and artisanal marine fisheries. Recent estimates suggest that worldwide 20% of all freshwater species are extinct, endangered or vulnerable (Moyle and leidy, 1999). Presently fish and fisheries sector contribute 60% of total protein intake, 3.5 % to GDP, 23% to agricultural production and 2.73% to foreign export earning of the nation (DoF, 2012). This country is rich in fish and aquatic resources and other biodiversity. Bangladesh's inland water bodies are known to be the habitat of 289 species of indigenous fish, 13 exotic fish, 56 prawns, about 26 freshwater mollusks, and 150 birds (DoF, 2012). The depletion of biodiversity is the result of various kinds of human development interventions and activities, especially in the areas of agriculture, forestry, fisheries, urbanization, industries, chemicals, minerals, transport, tourism, and energy. Among the 260 fresh water

fish species, many species are threatened in Bangladesh (Rahman, 1989).

IUCN Bangladesh (2003) revealed 54 threatened freshwater fish species in Bangladesh, of which 12 are critically endangered, 28 endangered and 14 are vulnerable. A total 66 species under 08 orders and 23 families were recorded from the sampling from Chalan beel (Rahman *et al.*, 2017). The Dharla River is the major spawning ground and habitat of many of the freshwater indigenous fish species like Shol (*Channa striatus*), Tara baim (*Macrogathus aculeatus*), Tengra (*Mystus cavasius*), Baim (*Mastacembelus armatus*), Katchki (*Corica suborna*), Darkina (*Esomus danricus*), Chanda (*Chanda nama*), Ggutum (*Lepidocephalus guntea*), Kholisha (*Colisa fasciatus*), Rui (*Labeo rohita*), Catla (*Javelion catla*), Mrigal (*Cirrhinus cirrhosus*), kalibaush (*Labeo calbasu*), Tit punti (*Puntius ticto*), Punti (*Puntius sophore*), Chapila (*Gudusia chapra*), Koi (*Anabas testudinius*), Magur (*Clarias batrachus*), Shingh (*Heterophneustes fossilis*), Chitol (*Notopterus chitala*), Taki (*Channa punctata*), etc; during breeding season these indigenous species spawn in this river and serve as a major source for small and indigenous species in this area. These fishes spread in other water bodies during monsoon season.

Considering the above facts, the present investigation was undertaken to assess the present status of fish biodiversity in the Dharla River, Lalmonirhat district, to determine the availability of

endangered (EN) and critically endangered (CR) fish species in the study; to know about the conservation status of available fish species., and to formulate recommendations for effective management strategies and protect threatened (critically endangered, endangered and vulnerable) fish species in the Northern part of Bangladesh.

Materials and Methods

Experiment site

Data and sample collection were carried out mainly in fishing spots, fish markets and landing centers in and around Dharla River in Lalmonirhat district. Six study spots were selected under 6 villages in 3 Union of Lalmonirhat district. This study was conducted for nine months; from March to November, 2016. Frequent field visits (twice a month) were made during this time to collect necessary information.

Collection of fish sample

To record the fish diversity of Dharla River, fish species samples were collected and taking

necessary information. The fish specimen samples were collected with the help of fishermen from fishing spot and from retailers of fish markets and landing centers. For this purpose, periodic visits were made in different spots of the study area.

Species are classified by the IUCN Red List into nine categories, set through criteria such as rate of decline, population size, area of geographic distribution, and degree of population and distribution fragmentation (Table 1). The term "Threatened" is a grouping of three categories such as Critically Endangered, Endangered, and Vulnerable. (IUCN Bangladesh (2015a, b).

Data collection

Data on overall availability of fishes from Dharla River were collected according to questionnaire survey, field visit and fish market survey, fish 'arat' and fishing spots survey and from fishermen adjacent to river. Entries for different types of data were done using MS excel spreadsheet for the computational and statistical analyses of data.

Table 1: Threatend species are classified by the IUCN Red List.

Categories	Criteria
Extinct (EX)	No known individuals remaining
Extinct in the wild (EW)	Known only to survive in captivity, or as a naturalized population outside its historic range
Threatened	
Critically endangered (CR)	Extremely high risk of extinction in the wild
Endangered (EN)	High risk of extinction in the wild
Vulnerable (VU)	High risk of endangerment in the wild
Near threatened (NT)	Likely to become endangered in the near future
Least concern (LC)	Lowest risk. Does not qualify for a more at-risk category. Widespread and abundant taxa are included in this category
Data deficient (DD)	Not enough data to make an assessment of its risk of extinction
Not evaluated (NE)	Has not yet been evaluated against the criteria

Results and Discussion

A total of 23 threatened fish species under 7 orders were recorded during the investigation period. Out of 23 threatened fish species (Figure 1) 9 species belonged to orders Cypriniformes followed by Siluriformes (4), Perciformes (4), Channiformes (1), Mastacembeliformes (2) and Synbranchiformes

In the study period 23 threatened fish species found in Dharla River and there were 9 vulnerable, 11 endangered and 3 critically endangered species out of 54 threatened fish species of fresh and brackish-waters of Bangladesh (IUCN Bangladesh, 2003). In our study period, we have found a total of 8 exotic fish species in Dharla River. The fish species were particularly available during high rainy season when the river was flooded.

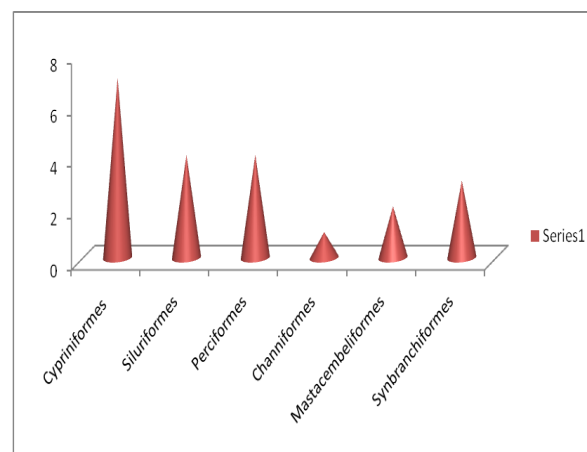


Figure 1: Threatened fish species under different orders identified from Dharla River

Table 2: A list of threatened (critically endangered, endangered and vulnerable) fish species available from Dharla River

Biodiversity Status according to IUCN Bangladesh	Scientific name	Local name
Critically Endangered	<i>Eutropiichthys vacha</i>	Bacha
	<i>Puntius sarana</i>	Sar puti
	<i>Labeo boga</i>	Bhangon
Endangered	<i>Sparata seenghala</i>	Guizza air
	<i>Labeo calbasu</i>	Kalbaus
	<i>Labeo gonius</i>	Ghonia
	<i>Osteobrama cotio</i>	Dhela
	<i>Ompok pabda</i>	Madhu pabda
	<i>Esomus danricus</i>	Darkina
	<i>Botia dario</i>	Rani/ Beti/Betia
	<i>Ompok poba</i>	Pabda
	<i>Mastacembelus armatus</i>	Baim
	<i>Puntius ticto</i>	Tit puti
	<i>Notopterus notopterus</i>	Foli
Vulnerable	<i>Sparata aor</i>	Air
	<i>Monopterusuchia</i>	Kuicha/kuche/ kuchia
	<i>Chanda nama</i>	Chanda/ namachanda
	<i>Pseudembassis ranga</i>	Lalchanda
	<i>Nandus nandus</i>	Meni/ Bheda/Roina
	<i>Channa orientalis</i>	Cheng
	<i>Macragnathus aculeatus</i>	Tara baim

Source: Field survey, 2016

Vulnerable species detected from Dharla River were 7 (out of 14 reported by IUCN Bangladesh). Among these 14 vulnerable species, 7 species (*Notopterus notopterus*, *Puntius ticto*, *Channa orientalis*, *Monopterusuchia*, *Chanda nama*, *Pseudembassis ranga*, *Macragnathus aculeatus*)

were found available, 2 species (*Sparata aor* and *Nandu nandus*) were rarely available (Plate-1) and 5 species (*Cirrhinus reba*, *Ailichthys punctata*, *Anguila bengalensis*, *Labeo bata*, *Plotosus canius*) were not available during the study period (Figure 2).

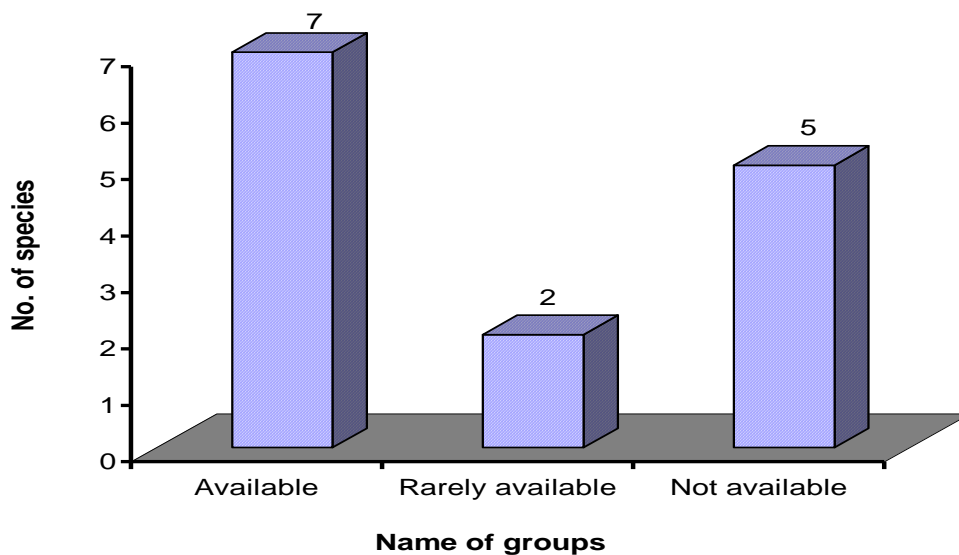


Figure 2: Vulnerable fish species found from Dharla River



Pseudambassis ranga



Chanda nama



Channa orientalis



Macrognathas aculeatus



Notopterus notopterus



Monopterus cuchia



Puntius ticto

Plate No. 1. Vulnerable fish species found from Dharla River

Endangered species detected from Dharla River were 11 (out of 28 reported by IUCN Bangladesh). Among these 11 endangered species 7 species (*Labeo calbasu*, *Ompok poba*, *Badis badis*, *Ompok pabda* (Modhu Pabda), *Botia dario*, *Esomus danricus*, *Mastacembelus armatus*) were found available, and 4 species were rarely available (*Notopterus chitala*, *Labeo gonius*, *Osteobrama cotio*, *Sparata seenghala*), (Plate 2) and 17 species

(*Barilius vagra*, *Bengala elanga*, *Chela laubuca*, *Crossocheilus latius*, *Labeo bata*, *Raimas bola*, *Rasbora rasbora*, *Barilius bendelisis*, *Channa marulius*, *Ompok bimaculatus*, *Botia lohachata*, *Chaca chaca*, *Silonia silondia*, *Dermogynys pusillus*, *Microphis deokata*, *Scatophagus argus*, *Ctenops nobilis*) were not found available during the study period (Figure 3).

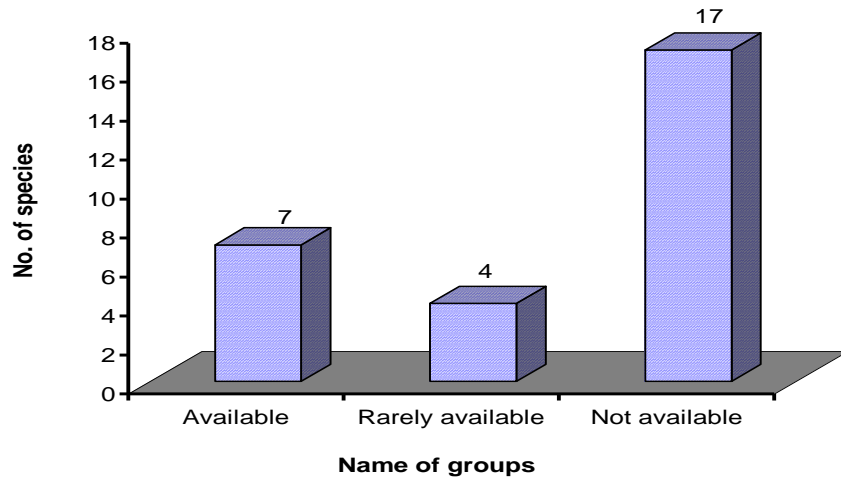


Figure 3: Availability of endangered fish species of Dharla River.



Notopterus chitala



Esomus danricus



Labeo gonius



Osteobrama cotio



Labeo calbasu



Botia dario



Ompok poba



Ompok pabda (Modhu Pabda)



Mastacembelus armatus



Badis badis



Sparata seenghala

Plate No.2. Endangered fish species available from Dharla River.

Biodiversity status of critically endangered fish species from Dharla River

Critically endangered species detected from Dharla River were 3 (out of 12 reported by IUCN Bangladesh). Among these 3 critically endangered species 2 (*Labeo boga*, *Puntius sarana*) were available 1 species (*Eutropiichthys vacha*) was rarely

available (Plate 3), 9 species (*Labeo nandina*, *Labeo pangusia*, *Bagarius bagarius*, *Clupisoma gaura*, *Rita rita*, *Tor tor*, *Pangasius pangasius*, *Sisor rhabdophorus*, and *Channa barca*) were not available during the study period (Figure 4). The peak time of availability most of these species were April to November.

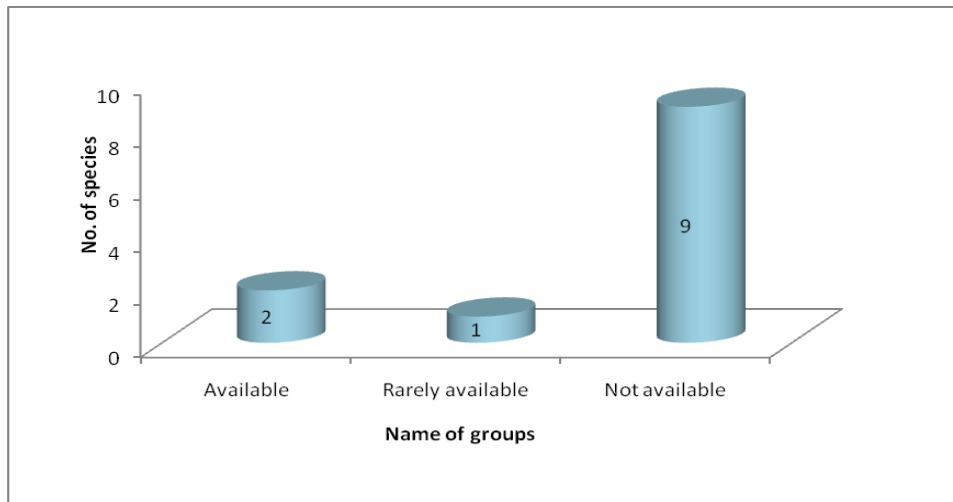


Figure 4: Availability of critically endangered fish species of Dharla River



Eutropiichthys vacha



Puntius sarana



Labeo boga

Plate No.3: Critically endangered fish species found from Dharla River.

The fish species were particularly available during high rainy season when the river was flooded. During our study we have recognized different types of fishing gears and methods used in Dharla River to collect fish. A total of 6 types of nets (*Jhaki jal, Dharma jal, Thela jal, Current jal, Berjal, chatka jal*), 5 types of traps (*Daudi, Charo, Hogra, Darki, Polo*), 2 types of hooks and lines (*Borshi, Boala borshi*), 3 types of wounding gears (*Koach, Achra, Ek Kata*) and 2 types of other fishing methods and different types of boats were recorded in Dharla River. Whereas Hossain et al. (2009) reported 114 fish species under 29 families from Chalan beel. Kostori et al. (2011) Found 82 SIS fish belonging to 10 orders, 22 families and 46 genera were recorded. The order Cypriniformes (42.68%) was the most dominant order comprising 35 species. The most dominant family of the order Cypiniformes was Cyprinidae (77.14%) comprising 27 species, which is similar to the present study. Ahmed et al. (2004) recorded a total of 52 fish species in Shakla beel (Brahmanbaria) of Bangladesh.

Conclusion

Biodiversity, the incredible variety of life on Earth that sustains us, is in peril. Species are becoming threatened at the most expeditious rate ever recorded. Over the past few decades it has become the issue of global concern for its rapid reduction worldwide. Bangladesh is no exception in this regard. The objectives of this study were set to observe the threatened fish diversity and status of fish in Dharla River. Regarding the status of availability of threaten fish species in this study areas a total of 21 threatened fish species were identified in the river among them, 7 vulnerable, 11 endangered and 3 critically endangered species. So it is necessary to improve the habitat by following the national policy planning authorities should recognize the necessity for conservation of biodiversity and ensure multi-sectoral coordination for it. Government agencies involved in biodiversity conservation should be strengthened and new agencies should be created wherever necessary, agencies for the survey of fauna and microorganism.

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