

Status and decline causes of fish diversity of Baral River, Natore, Bangladesh

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Abstract. The objective of this study was to describe the status and decline causes of fish diversity in Baral river, Natore, Bangladesh. The study was conducted over a period from November 2010 to May 2011 on the Bagatipara point of Baral river, Natore, Bangladesh. A total of 60 fish species of nine orders and 21 families were identified. On the basis of availability the species were categorized in four statuses that obtained as available (45%), less available (33.33%), rare (13.33%) and very rare (8.33%). Result of the study identified five species as very rare which may extinct near future resulting declination of the fish diversity. Few man made decline causes like agro-industrial wastages, different obstacles of water flow, excess use of river water, siltation and over fishing were observed as major threats for the diversity of fishes. The present work recommends preventing water pollution, ensuring water flow, developing fishermen's awareness, implementation of fisheries laws and declaration of fish sanctuary to save fish diversity of the study area. Besides, counter and random survey is recommended to cross check the fishes' status for their proper management and conservation.

Key Words: fish diversity, inland fishery, threatened fish, Baral river, Bangladesh.

Introduction. Inland open water fishery resources play a significant role in the economy and food habits of the people of Bangladesh (Kibria & Ahmed 2005; Hossain et al 2006). There are 260 indigenous freshwater fish species in Bangladesh (Rahman 2005). The number of these fishes differs on the basis of the character of aquatic ecosystems of a specific area (Rahman 2005). According to IUCN (1998), 54 species of fishes have been listed as threatened species in Bangladesh (DoF 2005). The recent report also noticed that ~20 species of indigenous fishes have become extinct over the last 10 years for the use of current nets, insecticides and chemical fertilizers as well as depletion of habitats (The Daily Star 2011). If the trend continues, nearly 70 percent of the local fish varieties may suffer the same fate in the next few years (The Daily Star 2011).

There are no well recognized statistics of the fish species of Bangladesh which are almost extinct now. Accordingly, area and habitat basis study is required to assess the status and decline causes of the fishes of Bangladesh. Some efforts have been made to assess fish diversity in different areas and water bodies of Bangladesh namely: Doha (1973) in Mymensing and Tangail district, Ahmed & Hasan (1981) in Karnaphuli reservoir, Islam & Hossain (1983) in the Padma river of the adjacent Rajshahi district, Bhuiyan et al (1992) in Rajshahi district, Zafar et al (2007) in Pagla river, Bhuiyan et al (2008) in Padma river, Mohsin et al (2009) in Bookbhara baor and recently Moumita et al (2011) in Bangali river, Bogra. Nevertheless the efforts are scanty to assess the present status of fish diversity of entire Bangladesh. To gear up the effort our objective was to assess the status and decline causes of fish diversity in Baral river, Natore, Bangladesh.

Material and Method. The study was conducted over a period of seven months from November 2010 to May 2011 at the Bagatipara point covering 23.80 km area (24° 19' 48" N, 88° 56' 42" E) of Baral river, Natore, Bangladesh. Specimens were collected fortnightly during daytime and preserved in 10% formalin to save from spoilage (Simon & Mazlan 2010). The specimens were identified to the species level according to Talwar & Jhingran (1991) and Rahman (2005). The species were then categorized in four statuses on the basis of interview and catch records of 180 fishermen as follows: Available (A): species observed throughout the year; Less Available (LA): species observed infrequently; Rare (R): species observed periodically; and Very Rare (VR): species observed fortuitously. Self observation and eyewitness methods were applied to collect the data regarding the decline causes of fishes. The findings were cross-checked carefully.

Results and Discussion. A total of 60 fish species comprising nine orders and 21 families were observed in Baral river (Table 1). The order basis percentage analysis of the fish species showed the highest occurrence belongs to the order Cypriniformes (31.67%), followed by Siluriformes (28.33%), Perciformes (13.33%), Clupeiformes (11.67%), Channiformes (6.67%) and Mastacembeliformes (3.33%) (Figure 1). Three orders viz. Beloniformes, Mugiliformes and Tetraodontiformes were found in the same percentage (1.67%) of the total catch. The observed species were categorized in four statuses and obtained as available (45.00%), less available (33.33%), rare (13.33%) and very rare (8.33%) (Figure 2).

The present finding represent the status of fishes on a specific point of Baral river, however, this is almost representing the declining trends of riverine fishes of Bangladesh. The status of fishes in inland water was much appreciable before twentieth century namely: Doha (1973) reported 106 species from Mymensingh and Tangail district; Islam & Hossain (1983) recorded 110 species from the river Padma near Rajshahi, whereas the status of fishes declined after twentieth century: 33 species are reported from Chitra and Fatki rivers (Hasan 2007); 75 species from Pagla river (Zafar et al 2007); 73 species from Padma river near Rajshahi (Bhuiyan et al 2008) and 59 species from Bangali river, Bogra (Moumita et al 2011). The findings of the present study especially the statuses of fishes clearly focusing the declining trends of fish diversity in the study area which alerting the gradual declination of fish diversity of Bangladesh.

During the study period man made causes were found dominant as decline causes of fish species in Baral River. It is observed that a number of drains have fallen into the river from both the banks. As a result various chemical wastages from agro-industrial sources fall through the drainage and sewerage systems and polluted the water quality consequently destroying the spawning, nursing and grazing grounds of fish species of the Baral river. The construction of diversion canal and sluice gates causes siltation in the river bed which influences the water flow consequently affecting the entire ecosystem of the Baral river. Moreover, it is also observed that excess use of river water, over fishing, degradation of breeding grounds, the capture of brood fish, destroy of fish fries etc. affected the survival and existence of the fish fauna and resulting the declination of fish diversity. Our results are agreed well with the recent report by a national daily newspaper Prothom Alo (2012): already 16 species of fishes are extinct and five hundred fishermen are unemployed from the Baral river due to the aforementioned reasons. Moreover, Agüero et al (1989) observed similar decline causes of fish diversity of inland water bodies of Bangladesh and recommended to solve them for the existence of fish population. IUCN (1998) reported 56 species freshwater fishes (out of 260 species) are critically endangered and 50 species of fishes have become rare which are found abundantly in the last decades in their research in Bangladesh. The result of the present study newly including five more species (*Puntius sarana*, *Ompok pabda*, *Otolithoides pama*, *Tenualosa ilisha*, *Tetraodon cutcutia*) as very rare status of the Baral river which may extinct in the near future.

Table 1

Status of fishes of the river Baral in relation to total catch

Order (No. of species)	Family (No. of species)	Species name with status	
Cypriniformes (19)	Cyprinidae (16)	<i>Labeo rohita</i> (Hamilton, 1822) (A)	
		<i>Labeo calbasu</i> (Hamilton, 1822) (LA)	
		<i>Labeo bata</i> Hamilton, 1822) (A)	
		<i>Catla catla</i> (Hamilton, 1822) (LA)	
		<i>Cirrhina mrigala</i> Hamilton, 1822 (LA)	
		<i>Cirrhina reba</i> (Hamilton, 1822) (A)	
		<i>Puntius sarana</i> (Hamilton, 1822) (VR)	
		<i>Puntius sophore</i> (Hamilton, 1822) (LA)	
		<i>Puntius ticto</i> (Hamilton, 1822) (A)	
		<i>Puntius chola</i> (Hamilton, 1822) (A)	
		<i>Puntius terio</i> (Hamilton, 1822) (A)	
		<i>Osteobrama cotio</i> (Hamilton, 1822) (LA)	
		<i>Gagata cenia</i> (Hamilton, 1822) (A)	
		<i>Rasbora daniconius</i> (Hamilton, 1822) (A)	
		<i>Amblypharyngodon mola</i> (Hamilton, 1822) (A)	
		<i>Securicula gora</i> (Hamilton, 1822) (A)	
Siluriformes (17)	Cobitidae (3)	<i>Botia dario</i> (Hamilton, 1822) (LA)	
		<i>Lepidocephalus guntea</i> (Hamilton, 1822) (A)	
	Siluridae (2)	<i>Somileptes gongota</i> (Hamilton, 1822) (R)	
		<i>Wallago attu</i> (Bloch & Schneider, 1801) (A)	
	Pangasidae (1)	<i>Ompok pabda</i> (Hamilton, 1822) (VR)	
		<i>Pangasius pangasius</i> (Hamilton, 1822) (R)	
	Schilbeidae (5)	<i>Clupisoma garua</i> (Hamilton, 1822) (A)	
		<i>Clupisoma atherinoides</i> (Bloch, 1794) (LA)	
		<i>Eutropiichthys vacha</i> (Hamilton, 1822) (LA)	
		<i>Ailia coila</i> (Hamilton, 1822) (A)	
<i>Aillichthys punctata</i> (Day, 1872) (A)			
<i>Heteropneustes fossilis</i> (Bloch 1794) (LA)			
<i>Clarias batrachus</i> (Linnaeus 1758) (LA)			
<i>Sperata aor</i> (Hamilton, 1822) (LA)			
Perciformes (8)	Sisoridae (1)	<i>Sperata seenghala</i> (Sykes, 1839) (LA)	
		<i>Mystus tengara</i> (Bleeker, 1846) (A)	
	Centropomidae (3)	<i>Mystus cavasius</i> (Hamilton, 1822) (A)	
		<i>Mystus bleekeri</i> (Day, 1877) (R)	
		<i>Rita rita</i> (Hamilton, 1822) (LA)	
	Anabantidae (3)	<i>Bagarius bagarius</i> (Hamilton 1822) (R)	
		<i>Chanda nama</i> (Hamilton, 1822) (A)	
		<i>Chanda baculis</i> (Hamilton, 1822) (A)	
	Mastacembeliformes (2)	Mastacembelidae (2)	<i>Chanda ranga</i> (Hamilton, 1822) (A)
			<i>Anabas testudineus</i> Bloch, 1792 (R)
<i>Colisa fasciatus</i> (Schneider and Bloch 1801) (A)			
<i>Colisa sota</i> (Hamilton, 1822) (A)			
Clupeiformes (7)	Clupeidae (3)	<i>Glossogobius giuris</i> (Hamilton, 1822) (A)	
		<i>Otolithoides pama</i> (Hamilton 1822) (VR)	
Mugiliformes (1)	Mugilidae (1)	<i>Mastacembelus pancalus</i> (Hamilton 1822) (A)	
		<i>Mastacembelus aculeatus</i> (Bloch 1786) (LA)	
Beloniformes (1)	Belonidae (1)	<i>Tenualosa ilisha</i> (Hamilton 1822) (VR)	
		<i>Gadusia chapra</i> (Hamilton 1822) (A)	
Tetraodontiforme (1)	Tetraodontidae (1)	<i>Corica suborna</i> (Hamilton 1822) (A)	
		<i>Notopterus notopterus</i> (Pallas, 1769) (LA)	
Channiformes (4)	Channidae (4)	<i>Notopterus chitala</i> (Hamilton 1822) (LA)	
		<i>Setipinna phasa</i> (Hamilton 1822) (LA)	
		<i>Setipinna taty</i> (Valenciennes, 1848) (R)	
		<i>Channa punctatus</i> (Bloch 1794) (A)	
Mugiliformes (1)	Mugilidae (1)	<i>Channa striatus</i> (Bloch, 1793) (LA)	
		<i>Channa marulius</i> Hamilton, 1822 (R)	
Beloniformes (1)	Belonidae (1)	<i>Channa gachaua</i> (Hamilton 1822) (R)	
		<i>Rhinomugil corsula</i> (Hamilton 1822) (LA)	
Tetraodontiforme (1)	Tetraodontidae (1)	<i>Xenentodon cancila</i> (Hamilton 1822) (LA)	
		<i>Tetraodon cutcutia</i> (Hamilton 1822) (VR)	

Note: A = Available, LA = Less available, R = Rare, VR = Very rare.

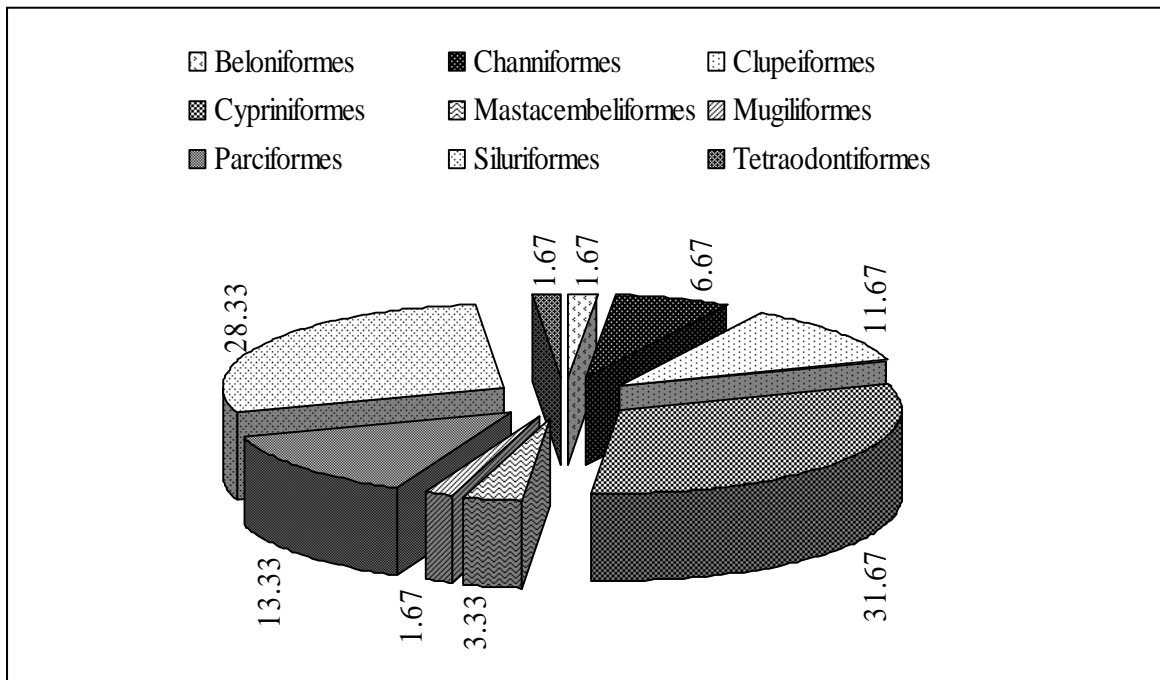


Figure 1. Percentage composition of fishes in different orders from the total catch of Baral river, Natore Bangladesh.

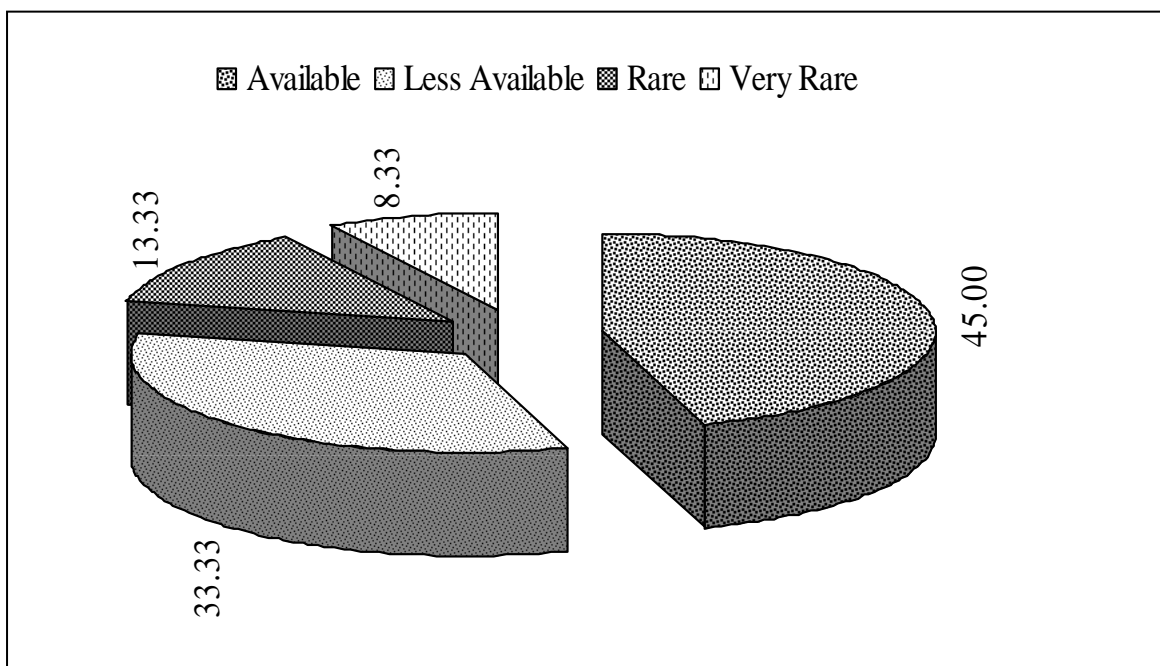


Figure 2. Percentage composition of fishes in relation to total catch from Baral river, Natore Bangladesh.

Conclusions. The study is a preliminary attempt to assess the fish diversity and its decline causes on a particular point of Baral river, Natore Bangladesh. The result of the study may not be the actual status of the fish diversity of the river as a whole. However, some recommendations like preventing water pollution, ensuring water flow, fishermen's awareness, implementation of fisheries laws and declaration of fish sanctuary have been coming out to save the fish diversity of the study area. Besides, counter and random survey are recommended to cross check the fishes' status for their proper management and conservation.

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