



# International Journal of Fisheries and Aquatic Studies

ISSN: 2347-5129

(ICV-Poland) Impact Value: 5.62

(GIF) Impact Factor: 0.352

IJFAS 2016; 4(1): 24-28

© 2016 IJFAS

www.fisheriesjournal.com

Received: 10-11-2015

Accepted: 10-12-2015

**Md. Kamrul Islam**

Department of Fisheries,  
Ministry of Fisheries and  
Livestock, Bangladesh.

**Kazi Ahsan Habib**

Department of Fisheries, Sher-e-  
Bangla Agricultural University,  
Dhaka-1207, Bangladesh.

**Md. Emranul Ahsan**

Department of Fisheries  
Management, Bangabandhu  
Sheikh Mujibur Rahman  
Agricultural University, Salna,  
Gazipur-1706, Bangladesh.

**Mir Mohammad Ali**

Department of Aquaculture,  
Faculty of Fisheries, Patuakhali  
Science and Technology  
University, Patuakhali-8602,  
Bangladesh.

**Siddhwartha Kumar Basak**

Department of Aquaculture,  
Bangladesh Agricultural  
University, Mymensingh,  
Bangladesh.

**Correspondence**

**Mir Mohammad Ali**

Department of Aquaculture,  
Faculty of Fisheries, Patuakhali  
Science and Technology  
University, Patuakhali-8602,  
Bangladesh.

## Fish biodiversity at Sibsa River in South- Western Bangladesh: status and conservation Requirements

**Md. Kamrul Islam, Kazi Ahsan Habib, Md. Emranul Ahsan, Mir  
Mohammad Ali, Siddhwartha Kumar Basak**

### Abstract

Sibsa River is a significant and familiar river in south-west Bangladesh in terms of fish production and source of income for many fishermen living around it. The present study was planned to assess the current fish diversity status of this river. Fish samples were collected fortnightly from six sampling stations of the Sibsa River at Khulna district in South-Western Bangladesh during May 2011 to April 2012. A total of 61 species of fish under 10 orders and 27 families were recorded. Perciformes were most leading order constituting 42.62% of the total fish population followed by Siluriformes (11.48%), Clupeiformes (9.84%), Pleuronectiformes (3.29%), Synbranchiformes (3.29%), Osteoglossiformes (1.64%), Beloniformes (1.64%), Mugiliformes (4.92%), Cypriniformes (16.39%) and Tetraodontiformes (4.92%). Fishes in this river are seriously affected by the various kinds of human development interventions and activities. Under this circumstance, a better understanding of the diversity and distribution of fishes in the Sibsa River is urgently needed.

**Keywords:** Fish Biodiversity, Present Status, Management, Sibsa River and Bangladesh.

### 1. Introduction

Bangladesh is known as the riverine country because of having a huge number of rivers distributed all around it<sup>[1]</sup>. It is blessed with various inland water bodies which are very rich in diversity of fish species. About 800 rivers counting tributaries flow through the country constituting a waterway of total length around 24,140 km where it bears a huge potential for fisheries sector<sup>[1,2]</sup>. Contribution of the river and estuary is 4.72% of total production and the production from this source is 1, 67, 373 MT<sup>[3]</sup>.

Bangladesh has the third biggest aquatic fish bio-diversity in Asia, after China and India, with about 800 species in fresh, brackish and marine waters<sup>[4]</sup>. It contains huge aquatic fish biodiversity with 260 freshwater fish species where minnows, catfish, eels, perch, gobies, clupeids and prawns constituted the major portion<sup>[5]</sup>.

Fisheries sector has already been well-known as a vital income and employment-generating sector in Bangladesh, cheap sources of healthy food for the population of the country<sup>[6-13]</sup>. Fish supplements to about 60% of our daily animal protein intake. About 10% of the population is dependent directly and indirectly on the fisheries for their living<sup>[2]</sup>.

It is widely accepted that the aquatic biodiversity of Bangladesh including Sibsa River has not been described statistically<sup>[14]</sup>. Loss of aquatic habitats happened for installing various physical infrastructures such as dam. Many inland water bodies are dried up. As a consequence, fish production has declined. In addition, farmers use chemical fertilizers and pesticides, which have devastated fish culture in a wider scale. According to IUCN 2000 report, out of 266 inland fish species 12 are critically endangered, 28 are endangered, 14 are vulnerable. Over exploitation, degradation of fish habitats, and subsequent declining fish production from natural aquatic resources, inland capture fisheries contribution has declined from 50% to 35% of total fish production and marine capture fisheries production has remained static over the last ten years<sup>[15]</sup>.

The degradation of natural water bodies resulting from human interferences due to construction of roads, embankments, deforestation, encroachment for agricultural production, indiscriminate use of pesticides and natural causes (siltation, drought, cyclone and intrusion of saline water) has had negative impacts on fish diversity in Bangladesh. On the other hand, the indiscriminate use of different fishing gears, harmful techniques of fishing threatens the biodiversity of the seasonal floodplains.

For the implementation of National Biodiversity Strategy and Action Plan it is essential to manage some of the distinct features of which biodiversity are composed [14]. For all the above reasons, the purpose of this study was to update the species check-list and to report new record of species inhabiting the Sibsa River, in order to facilitate further studies on this fauna by interested researchers. This list aims at building up authentic information about the species available at the Sibsa River in South- West Bangladesh.

### Materials and Methods

The Sibsa River is situated in the South- Western part of Bangladesh as between 21.38' and 23.1 north latitude and 88.58 east longitude and is 12 ft. above mean sea level (Figure 1). The fish samples were periodically collected from the Sibsa River in Khulna district at South-Western Bangladesh during May 2011 to April 2012. Samplings were conducted fortnightly from commercial catches landed at different fish landing centers. Data were analyzed in relation to composition of species caught in every month (May 2011 to April 2012) with help of key from [4, 16-18].



Fig 1: Map of the Study Area.

Fish were usually caught by means of the traditional fishing gears such as seine net (Sutar jal), cast net (*jhaki jal*), square lift net (*tar jal*), conical trap (*dughair*), fish angles (*Borsi*), Monofilament fixed gill net (*Current jal*) and Fish barrier (*Thaga*). The fresh samples were immediately chilled in ice on site and fixed with 10% buffered formalin upon arrival at the laboratory.

Furthermore, necessary data and information for threats to biodiversity and its conservation were collected through the survey on the fishers, fish farmers, fish traders, teachers, students, researchers, Government and NGO personnel and experienced persons related to fisheries sectors and available literatures.

### Results

A total of 61 species of fish under 10 orders and 27 families were recorded. Perciformes were the most dominant order constituting 42.62% of the total fish population followed by Siluriformes (11.48%), Clupeiformes (9.84%), Pleuronectiformes (3.29%), Synbranchiformes (3.29%), Osteoglossiformes (1.64%), Beloniformes (1.64%), Mugiliformes (4.92%), Cypriniformes (16.39%) and Tetraodontiformes (4.92%). A checklist of collected fish species is given below:

#### Order- Beloniformes

Family- Belonidae

Genus- Xenentodon

Species- *Xenentodon cancila*

#### Order- Osteoglossiformes

Family- Notopteridae

Genus- Notopterus

Species- *Notopterus notopterus*

#### Order- Pleuronectiformes

Family- Cynoglossidae

Genus- Cynoglossus

Species- *Cynoglossus arel*

Species- *Cynoglossus cynoglossus*

#### Order- Synbranchiformes

Family- Mastacembelidae

Genus- Mastacembelus

Species- *Mastacembelus armatus*

Genus- Macrognathus

Species- *Macrognathus aculeatus*

#### Order- Tetraodontiformes

Family- Tetraodontidae

Genus- Chelonodon

Species- *Chelonodon patoca*

Genus- Tetraodon

Species- *Tetraodon cutcutia*

Species- *Tetraodon fluviatilis*

#### Order- Mugiliformes

Family- Mugilidae

Genus- Rhinomugil

Species- *Rhinomugil corsula*

Genus- Liza

Species- *Liza parsia*

Species- *Liza subviridis*

#### Order- Clupeiformes

Family- Engraulidae

Genus- Setipinna

Species- *Setipinna phasa*

Family- Clupeidae

Genus- Tenualosa

Species- *Tenualosa ilisha*

Genus- *Tenualosa*  
 Species- *Tenualosa toli*  
 Genus- *Hilsa*  
 Species- *Hilsa kelee*  
 Genus- *Gonialosa*  
 Species- *Gonialosa manmina*  
 Genus- *Gudusia*  
 Species- *Gudusia chapra*

**Order- Cypriniformes**

Family- *Cobitidae*  
 Genus- *Botia*  
 Species- *Botia dario*  
 Genus- *Lepidocephalichthys*  
 Species- *Lepidocephalichthys annandalei*  
 Family- *Cyprinidae*  
 Genus- *Rasbora*  
 Species- *Rasbora daniconius*  
 Genus- *Amblypharyngodon*  
 Species- *Amblypharyngodon mola*  
 Species- *Amblypharyngodon microlepis*  
 Genus- *Cirrhinus*  
 Species- *Cirrhinus cirrhosus*  
 Genus- *Labeo*  
 Species- *Labeo rohita*  
 Species- *Labeo calbasu*  
 Species- *Labeo bata*  
 Species- *Labeo boggot*

**Order- Siluriformes**

Family- *Ariidae*  
 Genus- *Arius*  
 Species- *Arius gogora*  
 Family- *Sisoridae*  
 Genus- *Bagarius*  
 Species- *Bagarius bagarius*  
 Genus- *Glyptothorax*  
 Species- *Glyptothorax cavia*  
 Family- *Heteropneustidae*  
 Genus- *Heteropneustes*  
 Species- *Heteropneustes fossilis*  
 Family- *Bagridae*  
 Genus- *Sperata*  
 Species- *Sperata seenghala*  
 Genus- *Mystus*  
 Species- *Mystus vittatus*  
 Species- *Mystus gulio*

**Order- Perciformes**

Family- *Nandidae*  
 Genus- *Nandus*  
 Species- *Nandus nandus*  
 Family- *Scatophagidae*  
 Genus- *Scatophagus*  
 Species- *Scatophagus argus*  
 Family- *Lobotidae*  
 Genus- *Lobotes*  
 Species- *Lobotes surinamensis*  
 Family- *Sillaginidae*  
 Genus- *Sillaginopsis*  
 Species- *Sillaginopsis panijus*  
 Family- *Latidae*  
 Genus- *Lates*  
 Species- *Lates calcarifer*

Family- *Toxotidae*  
 Genus- *Toxotes*  
 Species- *Toxotes chatareus*  
 Family- *Gerreidae*  
 Genus- *Gerres*  
 Species- *Gerres filamentosus*  
 Species- *Gerres setifer*  
 Genus- *Polynemus*  
 Species- *Polynemus paradiseus*  
 Family- *Trichiuridae*  
 Genus- *Lepturacanthus*  
 Species- *Lepturacanthus savala*  
 Genus- *Eupleurogrammus*  
 Species- *Eupleurogrammus muticus*  
 Family- *Sciaenidae*  
 Genus- *Otolithoides*  
 Species- *Otolithoides pama*  
 Genus- *Pterolithus*  
 Species- *Pterolithus maculatus*  
 Genus- *Macrospinosa*  
 Species- *Macrospinosa cuja*  
 Family- *Stromateidae*  
 Genus- *Pampus*  
 Species- *Pampus argenteus*  
 Species- *Pampus chinensis*  
 Family- *Channidae*  
 Genus- *Channa*  
 Species- *Channa marulius*  
 Species- *Channa orientalis*  
 Species- *Channa punctata*  
 Species- *Channa striata*  
 Family- *Badidae*  
 Genus- *Badis*  
 Species- *Badis badis*  
 Family- *Gobiidae*  
 Genus- *Odontamblyopus*  
 Species- *Odontamblyopus rubicundus*  
 Genus- *Taenioides*  
 Species- *Taenioides buehanani*  
 Genus- *Acentrogobius*  
 Species- *Acentrogobius caninus*  
 Genus- *Pseudapocryptes*  
 Species- *Pseudapocryptes elongatus*  
 Genus- *Glossogobius*  
 Species- *Glossogobius giurus*

**Discussions**

In the River of Sibsa, Recorded 61 species of fishes were under 10 orders, 27 families and 48 genera. No previous information of fish fauna in the River Sibsa was found and thus comparison of the present findings with previous one was not possible. The recorded fish species were much lower than some other rivers of Bangladesh<sup>[11, 19]</sup> but presence of nearly similar number of fish species was also reported in Mahananda River<sup>[20]</sup>.

However, all these researchers concluded with gradual loss of biodiversity in their considered rivers. In that sense, this is also true for River Sibsa. Order Perciformes was found to be the most diversified fish group in terms of both number of species and individuals followed by Siluriformes and Cypriniformes. Similar findings were also reported by<sup>[20, 21, 22, 23]</sup>. This is because these three groups are the most dominant groups in freshwater bodies of Bangladesh<sup>[24]</sup>.

Sibsa is a river, which is hugely tormented by bank erosion

every year with a wide range of water fluctuation every year. Gradual reduction of fish species was also associated with the siltation of the river, irrigation and over fishing. In this circumstance, it is essential to take immediate action for habitat improvement of Sibsra River to save the fish biodiversity.

At present, loss of biodiversity is an alarming threat but the earliest effective management is essential to deal with this issue. According to Larka <sup>[25]</sup> effective management is essential to deal with this issue. Several reasons including degradation of natural habitats, excess fish exploitation by using illegal fishing gears, use of different aqua drugs in aquaculture ponds is responsible for the loss of aquatic biodiversity <sup>[21, 26, 27]</sup>. Conservation steps have been found during the present investigation that the stopping illegal fishing, identifying illegal protecting crucial breeding habitats, creating mass awareness are need to save the threatened fish fauna of this reservoir, also fishermen and protecting divers fish resources.

### Conclusion

The decline of the diversity and the loss of some fishes will have potential impacts on the global fish biodiversity, so more hotspots of fish biodiversity in the River should be identified as nature reserves. Therefore, it is most urgent to take suitable step to protect fish fauna of Bangladeshi river. The knowledge of conservation biology, such as the theory of Meta population ecology, should be applied to design nature reserves. As the threats to fish biodiversity in the Sibsra River basin have become serious and the conservation of fishes has become urgent, an integrated management plan should therefore be developed and implemented effectively. It is time to make proper policies and take necessary step to implement so that the future generation can get the fishes lively on the earth rather than photographs in literature. Data sharing and partnership between academic institutions and governmental agencies are particularly essential for the effectiveness of fish conservation.

### Acknowledgement

We express our gratitude to local fishers (Khulna, Bangladesh) for collecting samples. Special thanks are extended to those people who were helped in different capacities in this research.

### References

- Banglapedia, National Encyclopedia of Bangladesh, Asiatic Society of Bangladesh, 1st edition February, Dhaka, Bangladesh. Available from URL: www.banglapedia.org. January, 2012-2015, 10.
- DoF. National Fish Week Compendium, Department of Fisheries, Ministry of Fisheries and Livestock, Bangladesh, 2013, 144.
- DoF. National fish week compendium. Department of Fisheries, Ministry of Fisheries and Livestock, Governments of People's Republic of Bangladesh, Dhaka, 2015, 1-144.
- Hussain MG, Mazid MA. Genetic improvement and conservation of carp species in Bangladesh. Bangladesh Fisheries Research Institute and International Center for Living Aquatic Resources Management, 2001, 74.
- DoF (Department of Fisheries). Fishery statistical yearbook of Bangladesh 2007-2008. Fisheries Resources Survey System, Department of Fisheries, Bangladesh, 2009, 42.
- Ali MM, Hossain MB, Minar MH, Rahman S, Islam MS. Socio-Economic Aspects of the Fishermen of Lohalia River, Bangladesh. Middle-East Journal of Scientific Research 2014a; 19(2):191-195.
- Ali MM, Hossain MB, Rahman MA, Habib A. Diversity of Fish Fauna in the Chitra River of Southwestern Bangladesh: Present Status, Threats and Recommendations for Conservation. Asian Journal of Applied Sciences. 2014b; 7(7):635-643.
- Ali MM, Hossain MB, Rahman M, Rahman S. Post Stocking Management Practices by the Pond Fish Farmers in Barisal District, Bangladesh. Global Veterinaria 2014c; 13(2):196-201.
- Ali MM, Das BC, Islam SMA, Masud MA, Rahman MZ. Fishing Gears and Crafts Used by the Fishers at Lohalia River in Patuakhali. Journal of Environmental Science & Natural Resources. 2014d; 7(2):169-175.
- Ali MM, Rahman MA, Hossain MB, Rahman MZ. Aquaculture Drugs Used for Fish and Shellfish Health Management in the Southwestern Bangladesh. Asian Journal of Biological Sciences. 2014e; 7(5):225-232.
- Ali MM, Hossain MB, Masud MA, Alam MAW. Fish Species Availability and Fishing Gears Used in the Ramnabad River, Southern Bangladesh. Asian Journal of Agricultural Research. 2015; 9(1):12-22.
- Basak SK, Ali MM, Islam MS, Shaha PR. Aquatic weeds of Haor area in Kishoregonj district, Bangladesh: Availability, Threats and Management Approaches. International Journal of Fisheries and Aquatic Studies. 2015; 5(6):151-156.
- Mahmud S, Ali ML, Ali MM. Present Scenario on Livelihood Status of the Fishermen in the Paira River, Southern Bangladesh: Constraints and Recommendation. International Journal of Fisheries and Aquatic Studies. 2015; 2(4):23-30.
- Chowdhury MSN, Hossain MS, Das NG. Environmental variables and fisheries diversity of the Naaf River Estuary, Bangladesh. J Coast Conserv. 2010; 15:163-180.
- Mazid MA. Development of Fisheries in Bangladesh: Plans and Strategies for Income Generation and Poverty Alleviation. Momin Offset Press, Dhaka, 2010.
- Fischer W, Whitehead PJP. Editors FAO Species Identification Sheets for Fishery Purposes. Eastern Indian Ocean (fishing area 57) and Western Central Pacific (fishing area 71). Rome: FAO, 1974, 14.
- Talwar PK, Jhingran AG. Inland fishes of India and adjacent countries. IBH publishing Co. Pvt. Ltd. New Delhi 1991; 12:1158.
- DeBruin GHP, Russell BC, Bogusch A. FAO Species Identification Field Guide for Fishery Purposes. The Marine Fishery Resources of Sri Lanka. Rome: Food and Agricultural Organization, 1995, 400.
- Bhuiyan SS, Joadder MAR, Bhuiyan AS. Occurrence of fishes and non-fin fishes of the River Padma near Rajshahi, Bangladesh. Univ. J Zool. Rajshahi Univ 2008; 27:99-100.
- Mohsin ABM, Haque ME. Diversity of Fishes of Mahananda River at Chapai Nawabganj District. Res. J Biol. Sci 2009; 4(7):828-831.
- Galib SM, Samad MA, Mohsin ABM, Flowra FA, Alam MT. Present Status of Fishes in the Chalan Beel- The Largest Beel (Wetland) of Bangladesh. Int. J Ani. Fish. Sci 2009; 2(3):214-218.
- Mohsin ABM, Hasan MM, Galib SM. Fish Diversity of

- Community Based Fisheries Managed Oxbow Lake (Bookbhara Baor) in Jessore, Bangladesh. J Sci. Foundation. 2009; 7(1):121-125.
23. Imteazzaman AM, Galib SM. Fish Fauna of Halti Beel, Bangladesh. Inter. J Curr. Res. 2013; 5(1):287-290.
  24. Rahman AKA. Freshwater Fishes of Bangladesh, first edition, Zoological Society of Bangladesh, University of Dhaka, Dhaka, Bangladesh, 1989, 364.
  25. Lakra WS. Fish Biodiversity of Uttar Pradesh: Issues of Livelihood Security, Threats and Conservation. National Conference on Biodiversity, Development and Poverty Alleviation. Uttar Pradesh State Biodiversity Board, India, 2010, 40-45.
  26. IUCN Bangladesh. Red book of threatened fishes of Bangladesh, IUCN- The world conservation union, 2000, 12-116.
  27. Galib SM, Samad MA, Hossain MA, Mohsin ABM, Haque SMM. Small Indigenous Species of Fishes (SISF) in Chalan Beel with Reference to their Harvesting and Marketing. Bangladesh J Prog. Sci. Tech. 2010; 8(2):251-254.