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STATUS OF THREATEN FISH SPECIES IN NARSUNDA RIVER

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ABSTRACT

To identify the threatened fish species and focus on fish biodiversity conservation in the Narsunda River Kishoreganj Sadar, Kishoreganj district, the present study was conducted for a time period of 6 months (April-November, 2012). A total of 23 threatened fish species were identified in the river among them, 9 vulnerable, 11 endangered and 3 critically endangered species as well as 8 exotic fish species were also found in the River. The fishing gears used by the fishermen in Narsunda River includes 4 types of nets, 3 types of traps, 3 hooks and lines and 2 types of wounding gears whereas major fishing craft and gears were mainly wooden boat and seine net (locally called 'ber 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.

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INTRODUCTION

The fish and fisheries sector play a very important role in national economy of Bangladesh. The principal sources of fish are inland fisheries and artisanal marine fisheries. Once these species were available in our water bodies but now the availability of the species declining day by day rapidly due to ecological degradation, indiscriminate fishing, use of pesticides, destruction of habitat, obstruction of breeding migration, use of restricted fishing gear and fishing pressure. Organochlorine pesticides are highly toxic to fish and other aquatic organisms. In sub-lethal doses, organochlorine pesticides affect the reproductive physiology of the fish (Mazid, 2002). 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 58% of total protein intake, 4.43% to GDP, 22.21% to agricultural production and 2.73% to foreign export earning of the nation (DoF, 2012). Fisheries sector supplement not only the food and nutrition sector but also the job sector. IUCN Red List (2003) revealed 54 threatened species of fishes in Bangladesh, some of them are: Grey feather back (*Notopterus notopterus*), Freshwater eel (*Anguilla bengalensis*), Snakeheads (*Channa marulius*, *C. barca*and *C. orientalis*), Darkina (*Rasbora rasbora*), Bhagna (*Labeo boga*), Olive barb (*Puntius sarana*), Mahashol (*Tor tor*), Baghair (*Bagarius bagarius*), Bacha (*Eutropichthys vacha*), Tara baim (*Macrognathus aculeatus*), Neptani (*Ctenopis noblis*), Napitkoi (*Badis badis*) and Bhanganbata (*Labeo bata*). No such endangered or threatened list of marine fish is not available in Bangladesh (Ahmed, 1995).

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). The biodiversity of these are categorized under different levels of threat, such as vulnerable (VU), endangered (EN), and critically endangered (CR). 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 Narsunda River is the major spawning ground and habitat of many of the freshwater indigenous fish species like Rui *(Labeo rohita),* Catla (*Jevelion catla),* Mrigal *(Cirrhinus cirrhosus),* kalibaush *(Labeo calbasu),* Tit punti *(Puntius ticto),*Punti*(Puntiussophore),* Chapila *(Gudusia chapra*), Koi *(Anabas testudinius),* Magur *(Clarias batrachus),* Shingh *(Heterophneustes fossilis),* Chitol *(Notopterus chitala),* Taki *(Channa punctata),* Shol *(Channa striatus),* Tara baim *(Macrognathus aculeatus),* Tengra *(Mystus cavasius),* Baim *(Mastacembelus armatus),* Katchki *(Corica suborna),* Darkina *(Esomus danricus),* Chanda *(Chanda nama), Ggutum (Lepidocephalus guntea),* Kholisha *(Colisa fasciatus),* 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.

MATERIALS AND METHODS

Data and sample collection were carried out mainly in fishing spots, fish markets and landing centers in and around Narsunda River in Kishoreganj District. Ten study spots were selected under 6 villages in 5 Union in Kishoreganj District. This study was conducted for six months; from April to November, 2012. Frequent field visits (twice a month) were made during this time to collect necessary information. For questionnaire interviews, simple random sampling method was followed for 3 fishermen, 2 aratdars and 2 retailers in each study site per survey.

Collection of fish sample

To record the fish diversity of Narsunda 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.

Data collection

Data on overall availability of fishes from Narsunda 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.

RESULTS

As Narsunda River is one of the important and long river in the northern part of Bangladesh it serve as a nursery, breeding and feeding grounds of many of the threatened fish species. Waters are available for about 5-7 month (April- November) in this river and fishermen harvest fish mainly during April to November and January to February. 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), Osteoglossiformes (2) and Synbranchiformes (1).

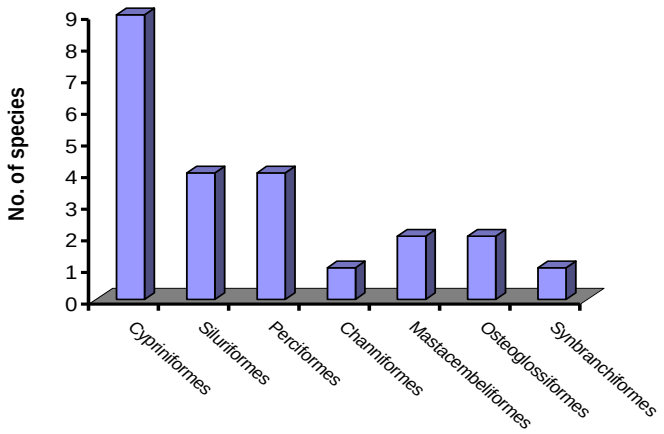

Figure 1. Threatened fish species under different orders identified from Narsunda River.

Among 54 threatened fish species listed by IUCN only 23 were identified from Narsunda River during the study period. Among them 16 species were found available, 7 species rarely available and 31 species were found not available during the study period (Table 1 and Figure 2). The three categories of threatened species vulnerable, endangered and critically endangered fishes from Narsunda River were separately discussed in the following sections.

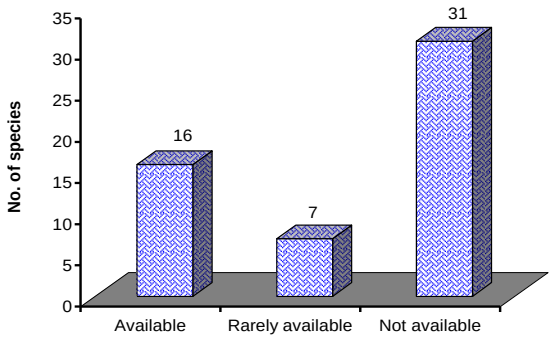

Figure 2. Availability of threatened species of Narsunda River

Vulnerable species detected from Narsunda River were 9 (out of 14 reported by IUCN Bangladesh). Among these 9 vulnerable species, 7 species *(Notopterus notopterus, Puntius ticto, Channa orientalis, Monopterus cuchia, Chanda nama, Pseudembassis ranga, Macrognathus aculeatus*) were found available, 2 species *(Sparata aor and Nandu nandus*) wererarely available and 5 species (*Cirrhinus reba*, *Ailichthys punctata, Anguila bengalensis,Labeo bata, Plotosus canius*) were not available during the study period shown in the (Figure 3). The peak time of availability of most of these species were April to November.

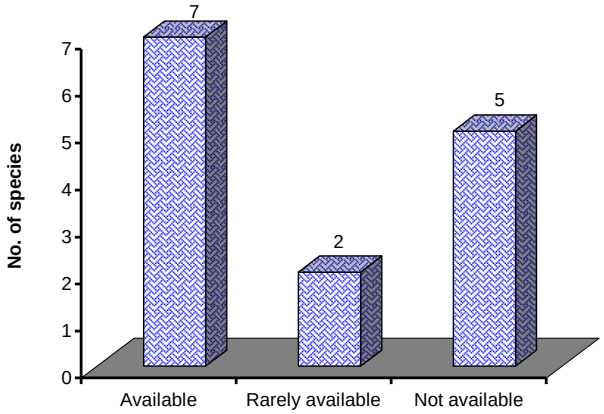

Figure 3. Availability of vulnerable fish species of Narsunda River

Endangered species detected from Narsunda 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, Botia dario, Esomus danricus, Mastacembelus armatus)* were found available, and 4 species were rarely available *(Notopterus chitala, Labeo gonius, Osteobrama cotio, Sparata seenghala*), 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, Silionia silondia, Dermogynys pusillus, Microphis deokata, Scatophagus argus, Ctenops nobilis*) were not available during the study period (Figure 4). The peak time of availability of most of these species were April to November.

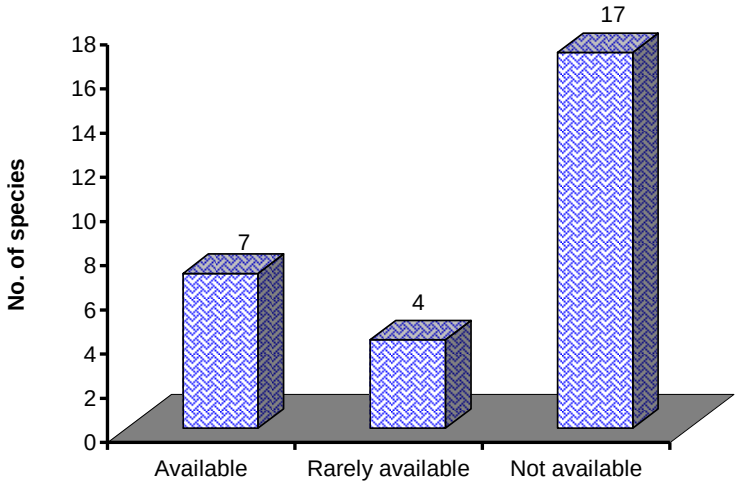

Figure 4. Availability of endangered fish species of Narsunda River

Critically endangered species detected from Narsunda 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 *(Eutropiicthys vacha)* was rarely available, 9 species *(Labeo nandina, Labe pangusia, Bagarius bagarius, Clupisoma gaura, Rita rita, Tor tor, Pangasius pangasius, Sisor rhabdophorus, and Channa barca)* were not available during the study period. The peak time of availability most of these species were April to November.

Among threatened 54 species reported from fresh and brackish waters of Bangladelsh (IUCN Bangladesh, 2003). 23 species were available from Narsunda River in this study and 31 species were not available. The 31 threatened fish species that were not available during our study included 10 critically endangered (*Labeo boga, Labeo bata,Labeo nandina, Labe pangusia, Tor tor, Pangasius pangasius, Clupisoma garua, Bagarius bagarius, Sisor rhabdophorus and Channa barc*), 17 endangered (*Barilius bendelisis, Barilius vagra, Bengala elanga, Chela laubuca. Crossocheilus latius, Raimas bola, Batasio tengara, Botia lohachata, Silionia silondia, Dermogynys pusillus, Microphis deokata, Scatophagus argus, Ctenops nobilis, Channa marulius, Chaca chaca, Mystus cavasius and Ompok bimaculatus*), and 4 vulnerable species (*Plotosus canius, Anguilla bengalensis, Cirrhinus reba, Ailichthys punctata*). These 31 fishes belonged to 12 Cypriniformes followed by Siluriformes (12), Perciformes (2), Cypridontiformes (2) Syngnathiformes (1), Anguilliformes (1), Channiformes (1) (Figure 5).

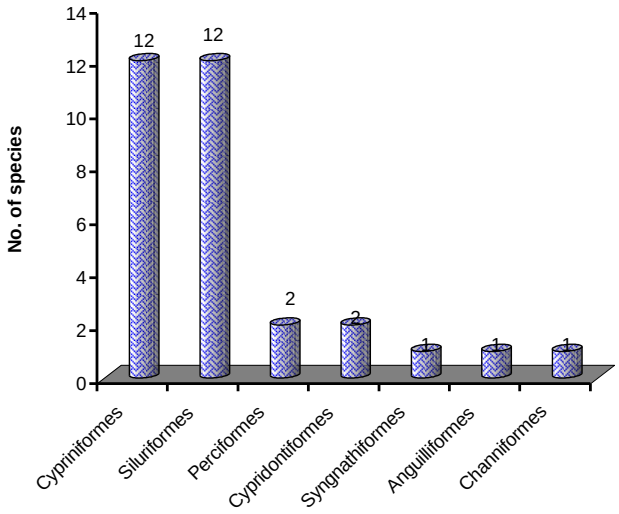

Figure 5. Threatened fish not available from Narsunda River

Table 1. List of threatened (critically endangered, endangered and vulnerable) fish species available from Narsunda river

Biodiversity Status according to IUCN Bangladesh (2003)	Scientific name	Local name
Critically Endangered	*Labeo boga*	Bhangon
	Puntius sarana	Sar puti
	Eutropiichthys vacha	Bacha
	Notopterous chitala	Chital
	Badis badis	Napit koi
Endangered	*Sparata seenghala*	Guizza air
	Labeo calbasu	Kalbaus
	Labeo gonius	Ghonia
	Osteobrama cotio	Dhela
	Ompok pabda	Madhu pabda
	Esomus danricus	Darkina
	Botia dario	Rani/ Beti/Betia
	Ompok poba	Pabda
	Mastacembelus armatus	Baim
	Puntius ticto	Tit puti
	Notopterus notopterus	Foli
Vulnerable	*Sparata aor*	Air
	Monopterus cuchia	Kuicha /kuche /kuchia
	Chanda nama	Chanda/nama chanda
	Pseudembassis ranga	Lalchanda
	Nandus nandus	Meni/ Bheda/ Roina
	Channa orientalis	Cheng
	Macrognathus aculeatus	Tara baim

Table 2. List of threatened fish species not available from Narsunda River

Biodiversity status according to IUCN 2003	Scientific name	Local name
Critically endangered	*Tor tor*	Mohoshol
	Labeo nandina	Nandina
	Bagarius bagarius	Bagair
	Clupisoma garua	Gaura
	Pangasius pangasius	Pangus
	Rita rita	Rita
	Labeo pangusia	Ghoramukhi
	Channa barca	Tila shol
	Sisor rabdophorus	Sisor
	Labeo bata	Bata
Endangered	*Barilius vagra*	Khoksa/ Chedra
	Bengala elanga	Along/Sefatia
	Chela laubuca	Laubuka
	Crossochellus latis	Kala bata
	Raimus bola	Bhol/Vole
	Botia lohachata	Rani/Putul Boitta
	Batasio tengra	Tengra
	Ompok bimaculatus	Kani pabda
	Silionia silondia	Shilong
	Chaca chaca	Chaca
	Dermogynes pussilus	Ekthota
	Microphis deokata	Kumirerkhil
	Scatophagus argus	Bistara
	Ctenops nobilis	Neptani koi
	Channa marulius	Gojar
	Berilius bendelisis	JoiaTirulr/Tila
	Mystus cavasius	Gulsa tengra
Vulnerable	*Anguilla bengalensis*	Bamos /Baubaim
	Cirrhinus reba	Bata /Bhagna
	Ailichthys panctata	Kajuli/Baspata
	Plotosus canius	Gang magur

Table 3. Exotic fish species available from Narsunda River

Sl. No.	Scientific name	Local name	Fishbase name
01	*Cyprinuscarpio*var. *specularis*	Minar carp, Mirror carp	Common carp
02	*Hypophthalmichthys molitrix*	Silver carp	Silver carp
03	*Aristichthys nobilis*	Bighead carp	Bighead
04	*Ctenopharyngodon idella*	Grass carp	Grass carp
05	*Puntius gonionotus*	Thai sarpunti	Java barb
06	*Oreochromis mossambicus*	Tilapia	Telapia
07	*Oreochromis niloticus*	Nilotica	Nile tilapia
08	*Pangasius hypophthalmus*	Thai pangas	Sutchi

All of these fishes are cultured in ponds around the study area.

DISCUSSION

Among 23 threatened fish species found Narsunda River, 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 Narsunda 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 Narsunda River to collect fish. A total of 5 types of nets (Jhaki jal, Dharma jal, Thela jal, Current jal, Berjal), 3 types of traps (Daudi, Charo, Hogra), 3 types of hooks and lines (Borshi, Nolborshi, Boalaborshi), 2 types of wounding gears (Koach, Achra) and 2 types of other fishing methods and different types of boats were recorded in Narsunda 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

It is concluded that the study was conducted to determine the threatened fish diversity from Narsunda river in Kishoreganj Sadar Upazilla under Kishoreganj district for a period of six months from April to November, 2012. The objectives of this study were set to observe the threatened fish diversity and status of fish in Narsunda River. Regarding the status of availability of endangered fish species in this study areas, 7 species were available, 4 rarely available and 17 not available (out of 28 reported by IUCN Bangladesh). Fishermen were found to be fishing during April to November and January to February. They used mainly traditional boat some fisherman may also use engine boat for fishing as fishing craft. During the study period it was also found that the fish biodiversity of Narsunda River is declining at an alarming rate. 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.

REFERENCES

1. Ahmed ATA, 1995. Impact of other Sectoral Development on the Inland Capture Fisheries of Bangladesh. Proceeding of the Fourth Asian Fisheries Forum.
2. Ahmed KKU, Hasan RR, Ahamed SU, Ahmed T, Mustafa G, 2004. Ecology of Shakla beel (Brahmanbaria), Bangladesh, Bangladesh Journal of Fisheries Research, 8(2): 101-111.
3. BBS, 2002. "Statistical yearbook of Bangladesh", Bangladesh Bureau of Statistics, statistics division, Ministry of Planning, Government of People's Republic of Bangladesh, Dhaka, pp. 840.
4. Bhuiya MSH, 2002. Survey on Fisheries resources in Itna Upazilla Kishorgonj and their management practices. An MS. thesis, submitted to the department of fisheries management, Bangladesh Agricultural University, Mymensingh, pp. 40-50.
5. CBD, 1992. Text and Annexes, Convention on Biological Diversity, the Interim Secretariat for the CBD Geneva Executive Centre.
6. DoF, 2012. Jatio Motshow Soptaho Sankalan, Department of Fisheries. Ministry of Fisheries and Livestock, Dhaka. Bangladesh.
7. Faroque MG, 2006. Fisheries of Boro bela Beel in Mymensingh district and livelihood of the adjacent fishers and fish farmers. MS Thesis Department of Fisheries Management, BAU, Mymensingh. pp. 136.
8. Galib SM, 2008 A Study on Fish Diversity and Fishing Gears of Chalan beel with Reference to Preservation of Catches.4th year Thesis Submitted to the department of Fisheries, University of Rajshahi, Rajshahi.
9. Halder GC, Mazid MA, Haque MkL, Huda MS, Ahmed KK, 1991. A review on the fisheries fauna of the Kaptai Reservoir. Bangladesh Journal of Fisheries, 14: 127-135.
10. Haroon AKY, Halder GC, Rahman S, Razzaquee MA, Alarn M, Nurul amin, SM, 2002. Sylhet-Mymenensingh basin fish stock assessment. Final report, Bngladesh Fisheries Research Institute (BFRI), Riverine station, Chandpur, Bangladesh. pp. 81.
11. Hossain MAR, Nahiduzzaman M, Sayeed MA, Azim ME, M. Abdul Wahab MA, Olin PG, 2009. The Chalan *beel* in Bangladesh: Habitat and biodiversity degradation, and implications for future management. Lakes & Reservoirs: Research and Management, 14:3-19.
12. Hossain MS, Ehshan MK, Hossain MA, 2003. Small fish resources in the rivers, floodplains and upland areas of Bangladesh. pp. 87-96. In; Wahab MA, Thilsted , Haque ME 2002: Small Indegeneous species of fish in Bangladesh.Tecchnical Proc. BAU-ENRECA/DANIDA Workshop on Potentials of Small Indegeneous Species of Fish (SIS) in Aquaculture and Rice field Stocking for Improved Food and Nutrition Security in Bangladesh. 30-31 October 2002, Bangladesh Agricultural University, Mymensingh 2002, Bangladesh, pp. 166.
13. Hossein MS, Ehshan MA, Mazid MA, 1999. Fish Biodiversity study in three floodplains in Bangladesh. In Midden drop HAJ, Thompson PM, Pomery RS: Sustainable Inland Fisheries Management in Bangladesh, ICLARM Conference Proceedings, 58 229-233.
14. Hussain MM, 1999. Fishes and Fisheries of the River Atrai in Rajshahi with Reference to its Limnology, unpublished Ph.D. thesis, Department of Zoology, University of Rajshahi, Bangladesh. pp. 5-200.
15. IUCN Bangladesh, 2000. RedBook of Threatened Fishes of Bangladesh, International Union for Conservation of Nature and Natural Resources, The World Conservation Union. pp. 116.
16. IUCN Bangladesh, 2003. Bangladesher Biponno Bonnoprani (Red Book of Threatened Animals), International Union for Conservation of Nature and Natural Resources, The world conservation Union.
17. Jhingran AG, 1991. Fish and Fisheries of India, Revised and enlarged 3rdHindustan Publishing Corporation (India), Delhi, India. pp. 727.
18. Khan K, Ahmed U, John B, Hambrey, 2005. Studies on the fish catch efficiency of different types of fishing gear in Kaptai Reservoir, Bangladesh, Bangladesh Fisheries Research Institute, Reverine Station, Baburhat, Chandpur. Bangladesh and Poret of Leith, Edinburgh, UK.
19. Kibria MG, 2003. Diversified selective and non-selective fishing gears of Bangladesh. Pakistan Journal of Marine Science, 12: 159-173.

20. Kostori FA, Parween S and Islam MN, 2011. Availability of small indigenous species (SIS) of fish in the chalan beel – the largest wetland of Bangladesh. Univ. j. zool. Rajshahi Univ., 2011; 30: 67-72.
21. Mazid MA, 2002: Development of Fisheries in Bangladesh: Plans and Strategies for Income Generation and Poverty Alleviation. Momin offset press, Dhaka. pp. 176.
22. Moyle PB, Leidy RA, 1999. Loss of biodiversity in aquatic ecosystems: evidence from fish faunas. Pangas pp.127-169.
23. Moyle PB, Williums JE, 1990. Biodiversity loss in the temperate zone, decline of the native fish fauna of California Conserve. Biology, 4: 275-284.
24. Paul SKS, Rahman A, Razzaque, Chakraborty, 1993. Gear selectivity of floodplains. Progress Report, Fisheries research institute, TEP. Santahar, Bogra.
25. Rahman AKA, 1989. Freshwater Fishes of Bangladesh. Zoological Society of Bangladesh, Department of Zoology, University of Dhaka.Dhaka-1000, xviii –pp.203.
26. Rahman MA, Akter S., Haidar MI and Majumder MWR, 2017. Present status (Biodiversity and Conservation) of fish at Chalan *Beel* in Bangladesh. International Journal of Zoology Studies, 2 (2): 31-37.
27. Rana R, 2003. Utilization of aquatic resources and livelihood strategies of the fishing communities around the Baral beel in Sirajgang district. M.Sc. Thesis, Dept. of Zoology, Rajshahi University. pp. 157.
28. Saha JK, Hossain MR, Habib MAB, Ali MM, 2005. Impacts of fisheries and gears on biodiversity of fish and prawn in Gawava Beel, Nawabgonj, Bangladesh. Bangladesh A. U. Mymensingh, Bangladesh Food and Agricultural Organization of the UN. Rome, Italy.
29. Shafi M, Quddus, MAA 1982: Bangladesher Matshya Sampod (in Bangla), Bangla Academy, Dhaka, pp. 1-444.
30. Talwar PK, Jhingran K, 1991. Inland Fishes of India and Adjacent Countries, Vol I and II, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, Calcutta, pp. 1-1158.