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Present status of fish biodiversity in wetlands of Tahirpur Upazila under Sunamganj district in Bangladesh

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Abstract

The present study was conducted for a period of one year from January 2017 to December 2017 to identify the present status and threats to fish diversity in the wetlands of Tahirpur upazila under Sunamganj district in Bangladesh. It was done by questionnaire interviews (QI) of fishers, focus group discussions (FGD), and key informant interviews (KII) and secondary data collection. During the study period, a total of 74 fish species under 25 families were recorded. The species availability status was remarked in four categories and obtained as 24 commonly available, 19 moderately available, 24 rarely available, 7 very rarely available species. There were 3 extinct species also recorded. It is revealed that there has been gradual reduction of fish diversity in the wetlands of the area of Tahirpur upazila and average fish catch per fisherman per day was also reduced. Community based fisheries management, fishing gears maintenance, sanctuary establishment and management, stop pollution from coal and limestone project, implementation of fish acts and regulations, stocking of fish fingerling in the open waters, dredging of beels and raising public awareness can play a great role in conserving fish biodiversity.

Keywords: fish biodiversity, conservation, threatened species, wetlands, haors, beels

1. Introduction

Variety and variability of organisms (plants and animals) is called biodiversity. The earth contains about 71% of water and 29% of land. There is a huge amount of organisms living in the earth. The largest portion of water is in oceans. They hold between 96.5% to 97.5% of world waters. That leaves between 2.5% to 3.5% of freshwater. Bangladesh is a country of 1, 47, 570 square kilometers which contains a saline water content that called Bay of Bengal. The land contains about 1, 38, 168 square kilometers area and 13,830 square kilometers area is water. The delta plain of the Ganges (Padma), Brahmaputra (Jamuna) and Meghna river and their tributaries occupy 79% of the country.

There are so many wetlands in Bangladesh. The country blessed with vast water resources in the form of haors, beels, ponds, lakes, rivers canals, estuaries. The country possesses 46,99,387 hectares of inland waters in the form of permanent rivers and streams (8,53,863 ha), estuarine and mangrove swamps (1,77,700 ha), beels (1,14,161 ha), Kaptai Lake (68,800 ha), baors (5,488 ha), floodplains (27,02,304 ha), small ponds and tanks (3,71,309 ha), shrimp farms (2,75,274 ha) and seasonal culture ponds (1,30,488 ha) [4].

Inland water resource of Bangladesh is measure to be one of the richest in the world and that is potential for fisheries development. At present, Bangladesh is ranked 4th in aquatic biodiversity in Asia and abundant with freshwater and marine water resources comprised of 260 indigenous species and 12 exotic species, 24 prawn, 36 shrimp, 475 marine species [3]. The freshwater bodies of Bangladesh are considered a home to at least 265 species of fin fishes [10]. The fish production of inland water is decreasing day by day due to over exploitation of fish resources with increasing population pressure, use of agrochemicals and fertilizers in agricultural land, over fishing, fishing during breeding season, use of current net, industrial waste, over flood etc. Environmental degradation and human interventions reduce the habitat available of the species, resulting in a reduction in their numbers. As a consequences many fish are under different levels of threat, such as vulnerable (VU), endangered (EN), critically

endangered (CR) which category was provided by IUCN. Among 260 freshwater fish, 56 species are critically endangered, endangered and vulnerable [6]. The average annual rate of growth of the fisheries sector is 6.15% over the last 10 years [8].

Biodiversity and its conservation are regarded as one of the major issues for sustainable development. Biodiversity provides incalculable benefit to humanity, must directly; it comprises a vast genetic storehouse of medicines and foods. The biodiversity is decreasing day by day in Bangladesh. So, research work is very important to understand the main problems of decreasing biodiversity. Before taking any fisheries management tools, the fish biodiversity in the water must be known.

2. Materials and Methods

2.1 Description of study area

The fish species diversity was recorded in Tahirpur Upazila, Sunamganj district in Bangladesh from January 2017 to December 2017.

Sunamganj is a district that situated in the north eastern part of Bangladesh. There are 11 Upazilas in Sunamganj named Chattak, Jamalganj, Jagannathpur, Tahirpur, Dakshin Sunamganj, Derai, Shulla, Dowarabazar, Dharmapasha, Bishwambharpur and Sunamganj Sadar.

Tahirpur is a upazila which is mostly known for the beauty of

nature and large natural wetlands like haors and beels. The area of Tahirpur is 313.7 square kilometers. It contains 7 unions, 131 mouzas, 244 villages. It is located at 25.0917° N to 91.175° E. Meghalaya is situated in the northern part of Tahirpur and its eastern part is Biswambharpur upazila. Jamalganj is in Southern part and Dharmapasha is in western part of Tahirpur. The hilly areas of Meghalaya are the descent place of many rivers in Tahirpur. The area contains the unique wetland named haor. The second largest haor in Bangladesh named Tanguar haor is situated in the Tahirpur and Dharmapasha upazila. The haor is well known for its aquatic biodiversity. The haor is a wetland ecosystem of Bangladesh which physically is about bowl shaped shallow depression. During monsoon, haor receives a large amount of runoff water from the hilly region of Meghalaya and become vast waterbody looks like sea. The popular haors in Tahirpur are Tanguar haor, Shanir haor, Matian haor, Karcha haor etc.

There are also some rivers named Jadukata river, Patnai river, Bawlai river etc. which comes from the Meghalaya. There are also many beels, ponds, lakes in the area.

The popular beels are hatirgatha, mohisergatha, kawer khal, teilla beel, matian beel, boro beel etc.

The popular lake is Niladri lake which is situated in Takerghat have a great aesthetic value and great availability of fish biodiversity.

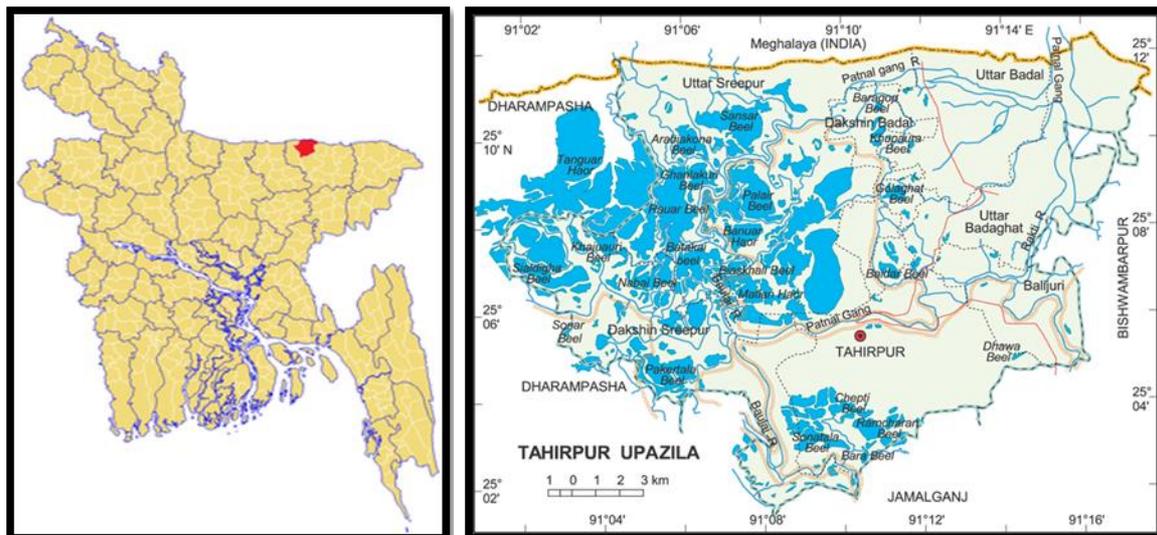


Fig 1: Map showing study area at Tahirpur upazila in Sunamganj district, Bangladesh. [The red mark indicate Tahirpur upazila, Sunamganj]. Map source: Banglapedia]

2.2 Data collection

A field survey was done in the area. Before that an appropriate questionnaire was prepared and used for collecting data from villagers of the surrounding study area in Tahirpur upazila. Primary and secondary sources are considered to interpret during data collection. Primary data is about present status of fish biodiversity were collected by 100 questionnaire interviews. The fisherman of the area involved in fishing in Tanguar haor, Shanir haor, Matian haor, Patnai haor, Niladri lake, Jadukata river, Bawlai river and some other wetlands. The primary data collection was done by questionnaire interview and secondary data was done to collect data. A total 15 focus group discussions were done to collect data where each group consisting 10 members. QI and FID's were made in 15 villages and bazaars which are popular

for fishing in Tahirpur named Badaghat Bazar, Balijuri Bazar, Sreepur Bazar, Bordal Bazar, Takerghat, Notunbazar, Ratansree, Sulemanpur Bazar, Lalghat Bazar, Kolagaon bazaar, Lawergorh Bazar, Anwarpur Bazar, Tahirpur Bazar, Matikata and Padabuka.

The secondary information about the fish diversity are collected from the Fisheries Officer of Tahirpur upazila, District Fisheries Officer of Sunamganj, local leaders, fish traders, NGO workers in the study area. The fish and prawn species were categorized into four groups on the basis of availability such as – Commonly Available (CA), Moderately Available (MA), Rarely Available (RA), Very rarely Available (VR). There are also some extinct fishes which are included. Finally data were analyzed using Microsoft Office Excels 2010.

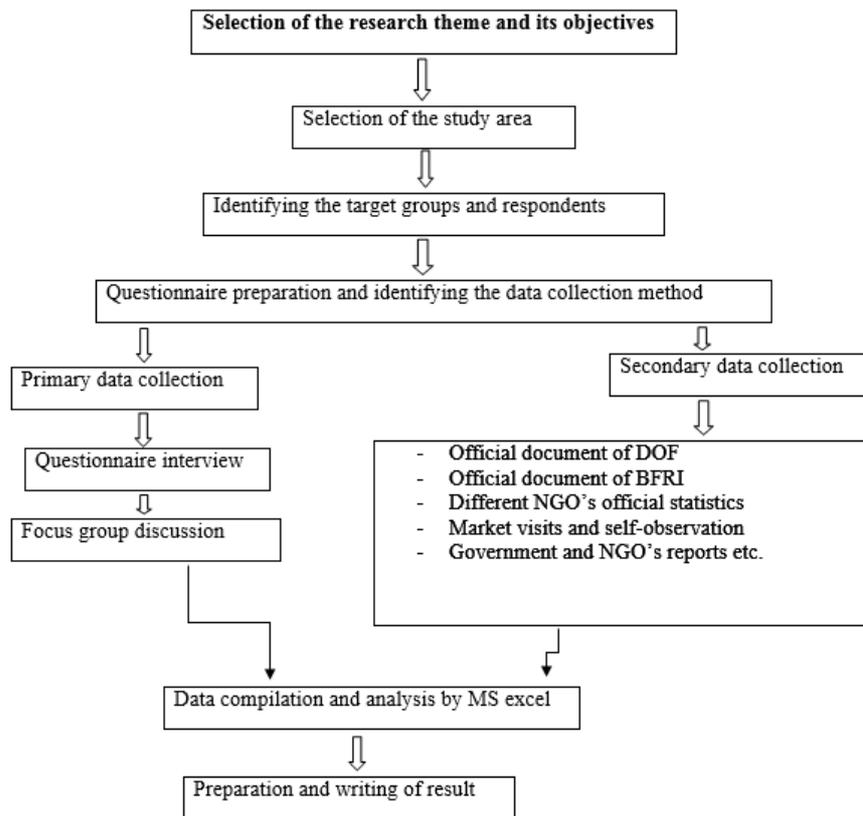


Fig 2: The design of the present study involved the steps

3. Results and Discussion

According to the statement of the local fisherman a total of 74 fish species under 25 families were recorded. The recorded fish species with accurate taxonomy were identified by the cross matching of definite fish characters from the text book named “Freshwater Fishes of Bangladesh (A. K. Aatur Rahman, Department of Fisheries, Matshya Bhaban, Dhaka)”^[11]. Nuruzzaman recorded 141 species of fish from Tanguar haor^[9]. Mahalder and Mustafa recorded 126 fish species from

39 families in the Sunamganj haor area that indicates higher fish diversity than the present study^[7]. Azadi and Alam found a total of 93 species of Ichthyofauna (finfish and shellfish) from River Halda^[1]. Chowdhury *et al.* reported 98 fish species in the Naaf river^[2], Islam *et al.* recorded a total of 114 fish species under 12 orders and 36 families from Payra River that indicate higher fish diversity than this study^[5]. The recorded fish species are represented in the following table with their biodiversity status in Tahirpur and IUCN status.

Table 1: List of recorded fish species with their status.

| S. No | Family | Local Name | Common Name | Scientific Name | Biodiversity Status | IUCN Status |
|-------|------------------|----------------|------------------------|-----------------------------------|---------------------|-------------|
| 1 | Siluridae | Modhu Pabda | Butter Catfish | <i>Ompok pabda</i> | CA | EN |
| 2 | Cobitidae | Gutum | Guntea Loach | <i>Lepidocephalichthys guntea</i> | CA | NO |
| 3 | Cyprinidae | Tit Punti | Ticto Barb | <i>Puntius ticto</i> | CA | VU |
| 4 | Cyprinidae | Teri Punti | One Spot Barb | <i>Puntius terio</i> | CA | NO |
| 5 | Cyprinidae | Jat Punti | Spot Fin Swamp Barb | <i>Puntius sophore</i> | CA | NO |
| 6 | Cyprinidae | Carpio | Common Carp | <i>Cyprinus carpio</i> | CA | EX |
| 7 | Nandidae | Bheda/Meni | Mud perch | <i>Nandus nandus</i> | CA | VU |
| 8 | Mastacembelidae | Tara Baim | Lesser spiny eel | <i>Macrognathus aculeatus</i> | CA | NO |
| 9 | Mastacembelidae | Guchi | Barred spiny eel | <i>Macrognathus pancalus</i> | CA | NO |
| 10 | Anabantidae | Baro khalisha | Striped gourami | <i>Colisa fasciatus</i> | CA | NO |
| 11 | Anabantidae | Chota khalisha | Honey gourami | <i>Colisa chuno</i> | CA | NO |
| 12 | Cyprinidae | Rohu/Rui | Indian major carp | <i>Labeo rohita</i> | CA | NO |
| 13 | Cyprinidae | Kalibaush | Black rohu | <i>Labeo calbasu</i> | CA | EN |
| 14 | Ambassidae | Gol chanda | Indian glass fish | <i>Parambassis ranga</i> | CA | VU |
| 15 | Anabantidae | Koi | Climbing perch | <i>Anabas testudineus</i> | CA | NO |
| 16 | Channidae | Taki | Spotted snakehead | <i>Channa punctatus</i> | CA | NO |
| 17 | Channidae | Shol | Snakehead murrel | <i>Channa striatus</i> | CA | NO |
| 18 | Bagridae | Golsha | Long whiskered catfish | <i>Mystus cavasius</i> | CA | VU |
| 19 | Bagridae | Tengra | Striped dwarf catfish | <i>Mystus vittatus</i> | CA | NO |
| 20 | Bagridae | Bujuri | Long bled catfish | <i>Mystus tengra</i> | CA | NO |
| 21 | Clariidae | Magur | Walking catfish | <i>Clarius batrachus</i> | CA | NO |
| 22 | Heteropneustidae | Shing | Stinging catfish | <i>Heteropneustes fossilis</i> | CA | NO |

| | | | | | | |
|----|-----------------|--------------------------|-------------------------------|------------------------------------|----|----|
| 23 | Palaemonidae | Kalo icha | Monsoon river prawn | <i>Macrobrachium malcolmsonii</i> | CA | NO |
| 24 | Palaemonidae | Sada icha | Prawn | <i>Macrobrachium sp.</i> | CA | NO |
| 25 | Cobitidae | Rani | Bengal loach | <i>Botio dario</i> | MA | EN |
| 26 | Gobiidae | Bele | Bar eyed goby | <i>Glossogobius giuris</i> | MA | NO |
| 27 | Channidae | Gozar | Giant snakehead | <i>Channa marulius</i> | MA | EN |
| 28 | Siluridae | Kani Pabda | Indian Butter Catfish | <i>Ompok bimaculatus</i> | MA | EN |
| 29 | Mastacembelidae | Baro Baim | Two-track Spiny Eel | <i>Mastacembelus armatus</i> | MA | EN |
| 30 | Cyprinidae | Lasso/Lachu | Reba Carp | <i>Cirrhinus reba</i> | MA | VU |
| 31 | Cyprinidae | Grass Carp | Grass Carp | <i>Ctenopharyngodon idella</i> | MA | EX |
| 32 | Cyprinidae | Ghonia | Kuria Labeo | <i>Labeo gonius</i> | MA | EN |
| 33 | Notopteriidae | Kanla/Foli | Bronze Featherback | <i>Notopterus notopterus</i> | MA | VU |
| 34 | Siluridae | Boal | Freshwater shark | <i>Wallago attu</i> | MA | VU |
| 35 | Cyprinidae | Mrigal | Indian Major Carp | <i>Cirrhinus cirrhosus</i> | MA | NO |
| 36 | Cyprinidae | Darkina | Flaying Barb | <i>Esomus danricus</i> | MA | DD |
| 37 | Cyprinidae | Mola | Carplet | <i>Amblypharyngodon mola</i> | MA | NO |
| 38 | Cyprinidae | Catla | Indian Major Carp | <i>Catla catla</i> | MA | NO |
| 39 | Ambassidae | Lamba Chanda | Elongated Glass Perchlet | <i>Chanda nama</i> | MA | VU |
| 40 | Channidae | Cheng | Asiatic Snakehead | <i>Channa orientalis</i> | MA | VU |
| 41 | Tetraodontidae | Potka | Ocellated Puffer fish | <i>Tetraodon cutcutia</i> | MA | NO |
| 42 | Cyprinidae | Rajpunti | Java barb | <i>Puntius gonionotus</i> | MA | EX |
| 43 | Clupeidae | Katchki | Ganges river sprat | <i>Corica soborna</i> | MA | NO |
| 44 | Chacidae | Chaka | Indian Chaca | <i>Chaca chaca</i> | RA | EN |
| 45 | Channidae | Pipla Shol | Barca | <i>Channa barca</i> | RA | CR |
| 46 | Sybranchidae | Kuchia | Gangetic Mud Eel | <i>Monopterusuchia</i> | RA | VU |
| 47 | Siluridae | Kalo Pabda | Pabo Catfish | <i>Ompok pabo</i> | RA | EN |
| 48 | Sisoridae | Baghair | Dwarf goonch | <i>Bagarius bagarius</i> | RA | CR |
| 49 | Cobitidae | Maitta Rani | Hora Loach | <i>Botia dayi</i> | RA | DD |
| 50 | Bagridae | Rita | Rita | <i>Rita rita</i> | RA | CR |
| 51 | Pangasidae | Thai Pangus | Sutchi Catfish | <i>Pangasius hypophthalmus</i> | RA | EX |
| 52 | Clupeidae | Chapila | Indian River Shad | <i>Gadusia chapra</i> | RA | NO |
| 53 | Cyprinidae | Bata | Minor Carp | <i>Labeo bata</i> | RA | EN |
| 54 | Bagridae | Ayre | Long Whiskered Catfish | <i>Mystus aor</i> | RA | VU |
| 55 | Cyprinidae | Dhela | Cotio | <i>Osteobrama cotio</i> | RA | EN |
| 56 | Cyprinidae | Sarpunti | Olive Barb | <i>Puntius sarana</i> | RA | CR |
| 57 | Belontiidae | Kankila | Fresh water gar fish | <i>Xenentodon cancila</i> | RA | NO |
| 58 | Hemiramphidae | Ekthota | Congaturi Halibeam | <i>Hyporamphus limbatus</i> | RA | NO |
| 59 | Cyprinidae | Chela | Fine scale razor belly minnow | <i>Chela cachius</i> | RA | VU |
| 60 | Gobiidae | Bele | Bar Eyed Goby | <i>Glossogobius giuris</i> | RA | NO |
| 61 | Ambassidae | Lal Chanda | Indian Glass Perchlet | <i>Parambasis lala</i> | RA | EN |
| 62 | Cyprinidae | Silver Carp | Silver Carp | <i>Hypophthalmichthys molitrix</i> | RA | EX |
| 63 | Anabantidae | Lal Khalisha | Dwarf Gourami | <i>Colisa lalia</i> | RA | NO |
| 64 | Cichlidae | Tilapia | Mozambique Tilapia | <i>Oreochromis mossambicus</i> | RA | EX |
| 65 | Bagridae | Ghagla | Menoda Catfish | <i>Hemibagrus menoda</i> | RA | NO |
| 66 | Palaemonidae | Golda | Prawn | <i>Macrobrachium rosenbergii</i> | RA | NO |
| 67 | Aplocheilidae | Kanpona | Blue panchax | <i>Aplocheilus panchax</i> | RA | NO |
| 68 | Cyprinidae | Khorsula | Blackline Rasbora | <i>Rasbora daniconius</i> | VR | NO |
| 69 | Notopteriidae | Chital | Indian Featherback | <i>Notopterus chitala</i> | VR | EN |
| 70 | Schilbeidae | Bamosh/ Kajuli/ Bashpata | Gangetic Ailia | <i>Alia colia</i> | VR | NO |
| 71 | Nandidae | Napit Koi | Badis | <i>Badis badis</i> | VR | EN |
| 72 | Schilbeidae | Bacha | Batchwa Vacha | <i>Eutropiichthys vacha</i> | VR | CR |
| 73 | Clupeidae | Illish | Indian River Shad | <i>Tenuulosa ilisha</i> | VR | NO |
| 74 | Cyprinidae | Kosapunti | Cosuatit Barb | <i>Puntius cosuatit</i> | VR | NO |

Commonly Available (CA), Moderately Available (MA), Rarely Available (RA), Very rarely Available (VR)

CR=Critically endangered, EN=Endangered, VU=Vulnerable, NO=Not threatened, DD=Data deficient and EX=Exotic species.

Some extinct fish species which names were collected from Sunamganj district fisheries officer. The extinct fish species of local fisherman and cross checked in UFO of Tahirpur, of Tahirpur are-

Table 2: The extinct fish species of Tahirpur upazila.

| S. No | Family | Local Name | English Name | Scientific Name | Biodiversity Status | IUCN Status |
|-------|-------------|----------------------|--------------------|-----------------------------|---------------------|-------------|
| 1. | Cyprinidae | Mohashol, Mohsheer | Tor Mohsheer | <i>Tor tor</i> | ET | CR |
| 2. | Cyprinidae | Nodir Pungus | Pangusia Labeo | <i>Labeo pangusia</i> | ET | EN |
| 3. | Anguillidae | Banesshwar, Baneshor | Indian Mottled Eel | <i>Anguilla bengalensis</i> | ET | VU |

ET- Extinct. CR=Critically endangered, EN=Endangered, VU=Vulnerable species.

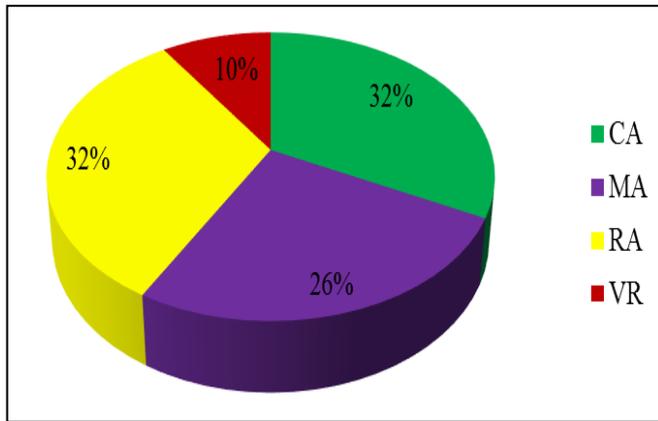


Fig 3: Present status of fish biodiversity in Tahirpur upazila

4. Recommendation

1. Last year, monsoon came fast, the paddy field of haors were over flooded and that occurred a great damage for fish diversity. Loss of dissolved oxygen and Synobacteria inflammation causes for higher death of aquatic fauna and birds, domestic animals in the area. So, Embankment should be build up to protect the flow of water. Use the Govt. budget properly without corruption of local leaders and officers of building embankment to build embankment in the haors. If the fishes die that will hamper the livelihood of the area.
2. The mining project of Takerghat and mining of sits from Jadukata river causes a huge damage of fish diversity in the area. In recent years, the mining project of Takerghat has been stopped. But the mining of silt in Jadukata river is increasing day by day. The mining of coal in Borchora Bazar also a cause of fish diversity decreasing. Govt's rule should be applied properly in mining zones and mines to protect our natural fish diversity. Some laws should be taken to protect diversity in the area.
3. Fish sanctuaries should be established in the selected wetlands area during breeding season.
4. No fishing in the fish sanctuary for several months should be ensured.
5. Overfishing should be prohibited in the area.
6. Buying, selling and using of banned fishing gears should be strictly prohibited in the selected area.
7. Community Based Fisheries management should be established in the haor areas specially in Tanguar haor.
8. Fishing during breeding season should be prohibited.
9. Use of agrochemical and fertilizers in agricultural land should be restricted.
10. Alternative earning source of the haor areas should be provided during the banned season of fishing.
11. Awareness of the people should be increased. UFO, DFO should arrange some programme about fishing consciousness and conservation in the area.

5. Conclusion

Haor regions are the highly diversified zone of Bangladesh and they are rich in aquatic biodiversity. The main waterbodies of Tahirpur are usually haors. According to the statement of local people of Tahirpur, the fish diversity of Tahirpur was very rich before 10 – 15 years ago. It is observed that, the fish diversity is decreasing day by day for various causes. Proper management practices are needed to conserve the fishes in the area. Wetland ecosystem protection is very important for fish conservation and protection of

suitable environment.

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