Journal of Ocean Research, 2013, Vol. 1, No. 1, 1-5
Available online at http://pubs.sciepub.com/jor/1/1/1

DOI:10.12691/jor-1-1-1

Fish Biodiversity of *Dingaputa Haor* and its Surrounding Area of Mohangong Upazila, Netrakona District

Md. Jahirul Islam[1], Md. Anisuzzaman[2], Maruf Hossain Minar[3,*], Md. Jahangir Sarker[2]

[1]Department of Environmental Science, Bangladesh Agricultural University, Mymensingh
[2]Department of Fisheries and Marine Science, Noakhali Science and Technology University, Sonapur, Noakhali
[3]Department of Fisheries Biology and Genetics, Bangladesh Agricultural University, Mymensingh
*Corresponding author: minarfims02@gmail.com

Received July 10, 2013; Revised September 25, 2013; Accepted September 26, 2013

Abstract There is a great importance of *dingaputa haor* in fish production, maintaining biodiversity, meeting local demand and regional demand and also serve as the good source of fish seed supply for other water bodies. So a study was undertaken to evaluate the present situation of fish biodiversity of fish species in this region. During the study period 49 species of fish fauna including shrimp species were recorded. Among them, 7 species of carps, 12 species of catfishes, 4 species of snakehead, 5 species perches, 3 species of eels, 6 species < barbs, 2 species of minnows, 3 species of clupied species and other miscellaneous 7 species including shrimp mainly *Macrobrachium rossenbergii* and *Macrobrachium malconsonii* were recorded. The highest intensity and abundance were found in eel and clupeid. This result may be due to availability and broad distribution of eel and clupeid throughout the year and all kinds of water bodies. Some reasons are found which are liable for the loss of fish biodiversity such as Degradation of wetland beds due to heavy sedimentation and death of most of the wetlands in winter, Cultivation of rice or other field crops by artificially drying wetlands destroys natural fish habitat, Catch of wide number of small indigenous fishes and egg laying species of fish, Destruction of small indigenous fishes by using chemicals termed them as weed fish species and enhancement of water reclamation. Steps should be taken as early as possible to prevent further degradation.

Keywords: *Dingaputa haor, fish biodiversity, biodiversity index, wetland ecosystem*

Cite This Article: Md. Jahirul Islam, Md. Anisuzzaman, Maruf Hossain Minar, and Md. Jahangir Sarker, "Fish Biodiversity of *Dingaputa Haor* and its Surrounding Area of Mohangong Upazila, Netrakona District." *Journal of Ocean Research* 1, no. 1 (2013): 1-5. doi: 10.12691/jor-1-1-1.

1. Introduction

From time memorial fish and fisheries are related to all aspect of Bangladeshi people [1]. At present 60% protein is supplied from the single source fish [2]. Due to a vast river network, warm temperature and high rainfall makes this country a diversified assemblage of fish [3,4]. There are about 289 freshwater species, 475 marine water species, 24 shrimp species are found in our country [5]. For this reason Bangladesh has become third in case of large aquatic biodiversity [6,7].

In bio-diversity "bio" means "life" and "diversity" means "variety". In essence bio-diversity means "variety of life". The simple definition of biodiversity is variation of life at all levels of biological observation" whether it may fish, plant or other things [1,8].

'*Saior*' is the original term from where the word '*haor*' is derived. In the monsoon all the floodplains and nearly *beels* are inundated by water and forms a large water basin which is commonly called *haor* [8]. *Dingaputa haor* is the inland freshwater wetland ecosystem, located at Mohonganj upazila of Netrakona district. It is also important for the conservation and sustainable utilization of wetlands. The surface area of *Dingaputa* Haor is 49 km^2. The *haor* is located at (Figure 1) 24°52′00″N 90°58′00″E / 24.8667°N 90.9667°E [9].

Hence forth various studies have been conducted to find out the diversity of fish and fish related organism both Bangladesh [9,10,11]. But hence forth no report has been found which dealt with fish biodiversity of *Dingaputa haor*. So the present study was conducted at *Dingaputa haor* and its surrounding area to see the abundance of various species of fish and so on.

2. Materials and Methods

The study area is located within the Mohonganj upazila at approximately between the latitudes of 24°52′00″N to 24.8667°N and between the longitudes of 90°58′00″E to 90.9667°E in Netrakona District in the Dhaka division of Bangladesh. It has 24011 units of house hold and total area243.2 km^2.It is located 30 km east from Netrakona district. Administratively, Mohanganj thana was turned into an upazilla in 1982. Mohanganj has 7 Unions & 1 pouroshobha, Namly UP-1: Birampur-Borkashia, UP-2: Borotoly-Baniahary, UP-3: Tatholia, UP-4: Magan-Siader, UP 5: Somaj-Shohildew, UP-6: Suair, UP-7: Gaglajur &

Pouroshobha Mohongonj. Mauzas/Mahallas 135, and 163 villages. There are big *haor*, namely "DINGAPUTA". The *dingaputa haor* is connected with the Kongso river which is the main source of water. The *Kangso* river is originated from the *Dhonu* river at its upstream and falls in the *Surma* river at its downstream. Almost entire *haor* was dried up during dry season except some *Jolmohols*. The water area during rainy season was 8000 hector and that in dry season was 5000 hector. Data were collected by the researcher himself through personal interview with the farmers and fishers. The study was conducted for a period of July to October, 2010.

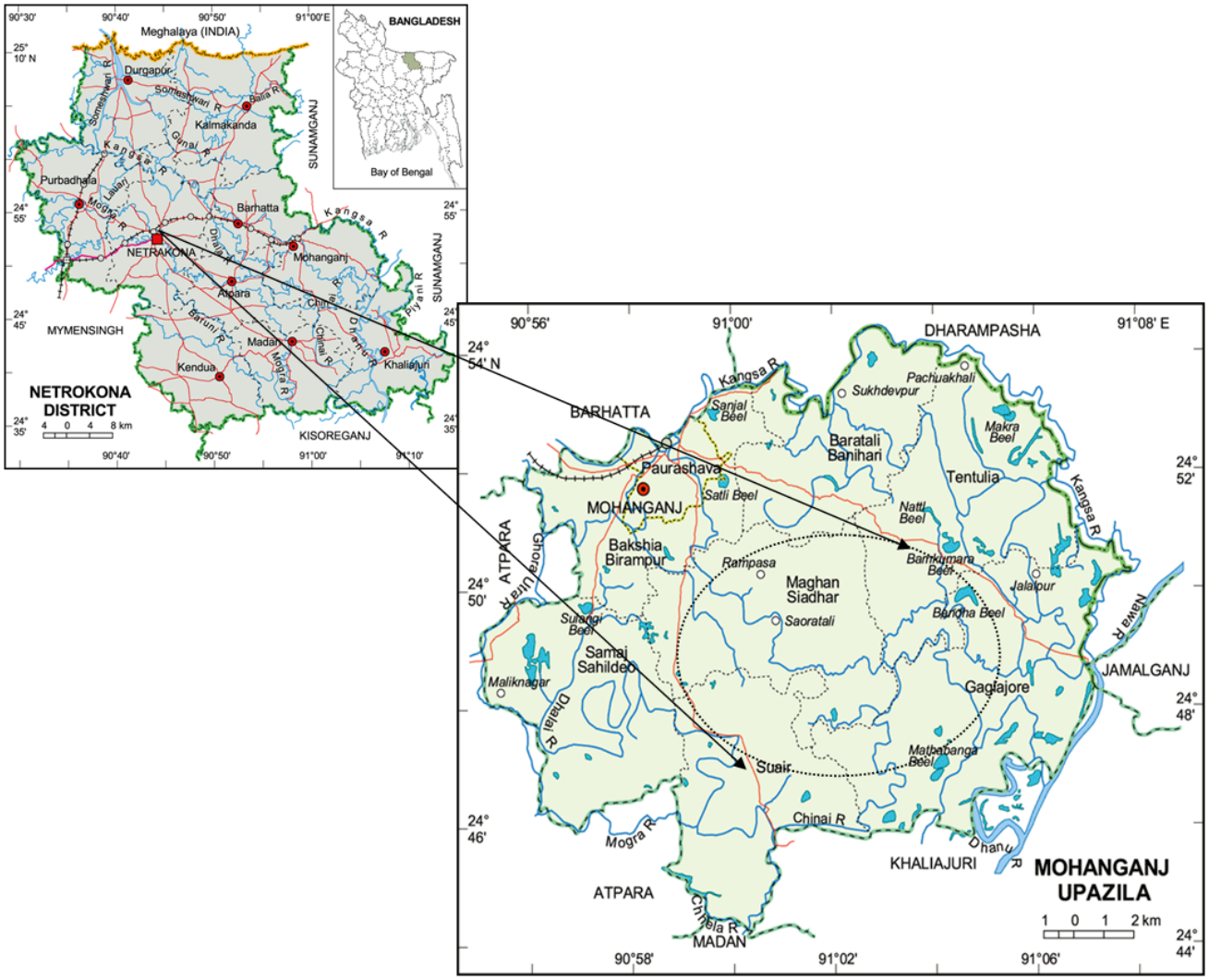

Figure 1. Study place

During collection of data both primary and secondary sources are considered. Primary data were collected from fishermen and farmer by the researcher himself. The secondary information was collected from fisheries offices, Agriculture offices, at Mohonganj upazila. The researcher collected information detailed on flora and fauna having diversity by spot visit. Several visits are made to the study area to collect accurate information.

Species diversity differs from species richness in that it takes into account both the numbers of species present and the dominance or evenness of species in relation to one another. As a measure of species diversity, we will calculate the Shannon index, H. Interestingly Shannon, a physicist, developed the index as a formula for measuring the entropy of matter in the universe. It turns out that the mathematical relationships hold true whether one is dealing with molecules in solution or species in an ecological community.

$$H = -\sum Pi\ In\ Pi$$

Where Pi is the proportional abundance of i^{th} species such that

Pi = n/N n is the number of the individuals in i^{th} species and N is the total number of the individuals in i^{th} species and N is the total number of the individuals of all species in the community.

3. Results and Discussion

3.1. Biodiversity of Fishes

There is a great importance of *Dingaputa haor* in fish production, maintaining biodiversity, meeting local demand and regional demand and also serve as the good source of fish seed supply for other water bodies. Unlike other haors, there is no major *khals* or a river that directly connects with the *haor*, providing the *haor* as the wetland of low sediment and with clear water and it is good ground for breeding of fishes. Submerged and amphibian vegetation are the good habitat for small and medium size

fishes mother fishes, where as natural reeds and other vegetation provide a natural ecological balance for shelter of other mother fishes.

During the study period 49 species of fish fauna including shrimp species were recorded. Among them, 7 species of carps, 12 species of catfishes, 4 species of snakehead, 5 species perches, 3 species of eels, 6 species < barbs, 2 species of minnows, 3 species of Clupied species and other miscellaneous 7 species including shrimp mainly *Macrobrachium rossenbergii* and *Macrobrachium malconsonii* were recorded. Similar number of fish species was noted by Haque *et al.* (1990) who recorded 43, 58 and 60 fish species from different types of Oxbow Lake Project (OLP). Seventy five (75) of species of fish belonging to 23 families and 50 genera were recorded from different aquatic habitat (pond, lake, canal, river and paddy field) reported by Paik and Chokraborty [12] which was comparatively higher in number than *Dingaputa haor*.

A rich diversity of fish species is highly desirable for the ecology and sustainable productivity of *haor*. Fisheries resources in Bangladesh are under great threat by manmade hurdle and various environmental degradations. For this, unique fish bio-diversity is being drastically reduced recently.

3.2. Carps

Carps fishes are widely accepted by consumer for its unique taste. During the study period of present investigation 7 species of carps were recorded. Among them rui was abundant and Carpio, Kalibus were common species. Rest of them was rare. A list of carp species are shown in (Table 1).

Table 1. A list of carp's species

SI. No.	**Local name**	***Scientific name***	**Family**	**Remarks**
1.	Carpio	*Cyprinus carpio*	Cyprinidae	Common
2.	Kaillara	*Labeo calbasu*	Cyprinidae	Common
3.	Rui	*Labeo rohita*	Cyprinidae	Less common
4.	Goinna	*Labeo gonius*	Cyprinidae	Less common
5.	Silver carp	*Hypophlhalmichthys molitrix*	Cyprinidae	Occasional
6.	Catla	*Gibelion catla*	Cyprinidae	Rare
7.	Mrigal	*Cirrhinas cirrosus*	Cyprinidae	Rare

3.3. Catfishes

Twelve species (12) of cat fishes were recorded in the *Dingaputha haor* during study period. Among different types of catfishes Tengra and *Bujuri* were abundant, *Gulsha, Batashi, Kajoli, Modhu pabda,* Air, Boal were common. On the other hand, chaca was less common and *Shing, Magur, Batcha* were rare. A list of catfishes is shown in (Table 2).

Table 2. A list of Catfish species as recorded in the present study

SI. No.	**Local name**	***Scientific name***	**Family**	**Remarks**
1.	Bujuri	*Mystus tengara*	Bagridae	Abundant
2.	Tengra	*Mystus vittatus*	Bagridae	Abundant
3.	Gulsha	*Mystus gulio*	Bagridae	Common
4.	Batashi	*Pscudotropius athcrinoides*	Schilbeidae	Common
5.	Kajoli	*Alia coila*	Schilbeidae	Common
6.	Modhu Pabda	*Ompok pabda*	Siluridae	Common
7.	Boal	*Wailago attu*	Siluridae	Common
8.	Air	*Mystus aor*	Bagridae	Common
9.	Gharua	*Clupisoma garua*	Schilbeidae	Less common
10.	Baghair	*Sagarins bagarius*	Sisoridae	Occasional/ Rare
11.	Shing	*Heteropneustes fossilis*	Heteropneus tidae	Rare
12.	Magur	*Clarias batrachus*	Clariidae	Rare

3.4. Snakehead, Perches and Eels:

Catch observation survey for the study of bio-diversity of *Dingaputha haor* reveal that there are different species of snakehead, perch and eels. In *Dingaputha haor* 4 species of snakehead were recorded during study period (Table 3). Among them only Taki *(Channa puctatus)* is abundant. Shol *(Channa striatus)* is common but Gazar and Raga are rare according to the conversation of local fishermen. In case of perch species 5 species were recorded (Table 4). Among them 3 species of Centropomidae were most abundant. Besides this another two species named koi *(Anabas testudineus)* and Khalisha *(Colisa faciatus)* were less common. Different species of eels including Boro Bairn, Tara baim and Chirka were abundant (Table 5).

Table 3. A list of Snakeheads

SI. No.	**Local name**	***Scientific name***	**Family**	**Remarks**
1.	Taki	*Channa punctatus*	Channidae	Abundant
2.	Shol	*Channa strialus*	Channidae	Common
3.	Raga	*Channa orientalis*	Channidae	Rare
4.	Gazar	*Channa marulius*	Channidae	Rare

Table 4. A list of Perch species

SI. No.	Local name	*Scientific name*	Family	Remarks
1.	Chanda	*Chanda haculis*	Centropomidae	Abundant
2.	Lal-chanda	*Chanda ranga*	Centropomidae	Rare
3.	Nama-chanda	*Chanda nama*	Centropomidae	Abundant
4.	Khalisha	*Colisa fasciatus*	Anabantidae	Less common
5.	Koi	*Anabas testudineus*	Anabantidae	Less common

Table 5. A list of Eels

SI. No.	Local name	*Scientific name*	Family	Remarks
1.	Tarabaim	*Macrognathus aculeatus*	Mastacembelidae	Abundant
2.	Borobaim	*Mastacembelus armatus*	Mastacembelidae	Abundant
3.	Chikra	*Mastacembelus pancalus*	Mastacembelidae	Abundant

Table 6. A list of Barbs and Minnows

SI. No.	Local name	*Scientific name*	Family	Remarks
1.	Phul chela	*Chela phulo*	Cyprinidae	Abundant
2.	Lamba chela	*Chela bacaila*	Cyprinidae	Abundant
3.	Mola	*Amblypharyngodon mola*	Cyprinidae	Abundant
4.	Dhela	*Rohtee cotio*	Cyprinidae	Abundant
5.	Jatputi	*Puntius sophore*	Cyprinidae	Abundant
6.	Titputi	*Puntius ticto*	Cyprinidae	Less common
7.	Darkina	*Esomus danrious*	Cyprinodontidae	Abundant
8.	Kanpona	*Aplocheihis panchax*	Cyprinodontidae	Abundant

Table 7. A list of Clupeid fish species

SI. No.	Local name	*Scientific name*	Family	Remarks
1.	Chapila	Gadusia chapra	Clupeidae	Abundant
2.	Goni chapila	*Gadusia minminna*	Clupeidae	Abundant
3.	Kachki	*Corica soborna*	Clupeidae	Abundant

3.5. Barbs, Minnows and Clupeids

During study period a huge number of barbs and minnows were found (Table 6). Among them 6 species of barbs and 2 species of minnows were identified. In case of clupied fish 3 species were abundantly found (Table 7).

3.6. Miscellaneous Fishes

During study period 7 others miscellaneous fish species were recorded from *Dingaputha haor*. Among them *Machrobrachium malcomsonii, Lapidocephalus guntea, Glossogobius giuris, Machrobrachium rossenbergii* were easily caught in large number. Another 3 species which were recorded from *Dingaputha hoar* were common. List of miscellaneous fish fauna of *Dingaputha haor* are shown in (Table 8).

Table 8. A list of miscellaneous fish species

SI.No.	Local name	*Scientific name*	Family	Remarks
1.	Bailla	*Glossogobius giitris*	Gobiidae	Abundant
2.	Gutum	*Lapidocephalus guntea*	Cobitidae	Abundant
3.	Kaikka	*Xenentodon cancila*	Belonidae	Common
4.	Choto tepa	*Tetradon cutcutia*	Tetraodontidae	Common
5.	Chitol	*Notopterus chitala*	Notopteridae	Common
6.	Sarong	*Macrobrachium rossenbergii*	Palaemonidae	Rare
7.	Chatka itcha	*Macrobrachium malcomsonii*	Palimonidae	Abundant

3.7. Species Diversity Index of Fishes

Species diversity index is a measure which renders considerable ecological insight. Shannon-Wiener Index of species diversity (H) was worked out to examine the species richness and abundance distribution in *haor* area.

The diversity index varies between the different groups of plant species (Table 9). The highest intensity and abundance were found in eel and clupeid. This result may be due to availability and broad distribution of eel and clupeid throughout the year and all kinds of water bodies. Catfish species are more stable and available in open water bodies to closed area.

Table 9. Formula of fish species diversity index H

Species	No. of individual	(pl)	|ln pl|	-Σ(pl) |ln pl|
Carp	7	0.143	-1.945	1.945
Catfish	12	0.245	-1.406	1.406
Snakehead	4	0.081	-2.513	2.513
Perch	5	0.102	-2.282	2.282
Eel	3	0.061	-2.797	2.797
Barbs	8	0.163	-1.814	1.814
Clupied	3	0.061	-2.796	2.796
Miscellaneous fish	7	0.142	-1.951	1.951
Total	49	1.00		

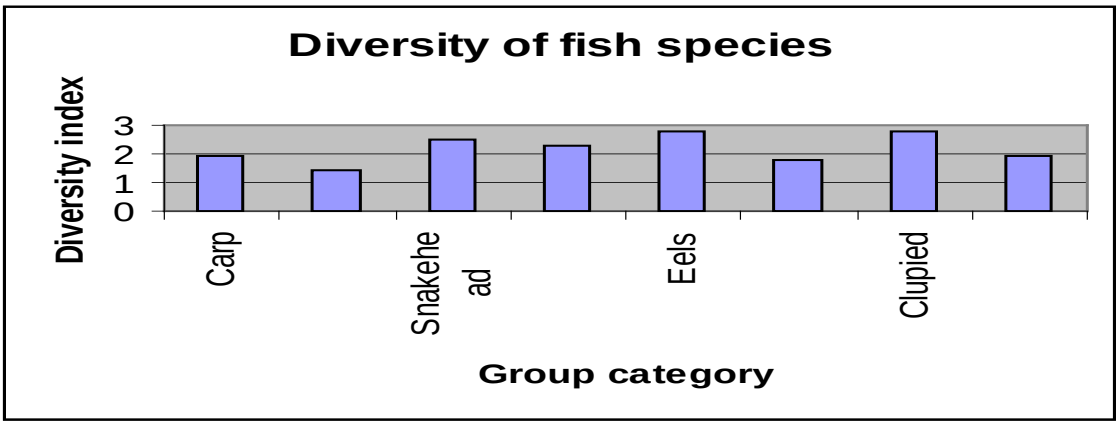

Figure 2. Diversity index of fish species in different group category (Shannon-Wiener index)

The graphical presentation (Figure 2) of Shannon diversity index showed the abundance and diversity of different fish species among the different group categories.

The wetland biodiversity of Bangladesh are being drastically by the impacts of the burgeoning human population. Wetlands are being continuously lost or degraded primarily because of various recent developments reflecting a lack of community awareness of wetland functions and values. Khan [13] reported that the rapid diminution of wetland biodiversity in relation to scarcity of water and pollution of water body, degradation and devastation of soil is essentially a crisis for the human spirit. Some reasons are found which are liable for the loss of fish biodiversity such as Degradation of wetland beds due to heavy sedimentation and death of most of the wetlands in winter, Cultivation of rice or other field crops by artificially drying wetlands destroys natural fish habitat, Catch of wide number of small indigenous fishes and egg laying species of fish, Destruction of small indigenous fishes by using chemicals termed them as weed fish species and enhancement of water reclamation, High market value of local fishes and rising of exotic fish cultivation in the wetlands etc.

References

[1] Khatun, S., Adhikary, R.K., Rahman, M., Sikder, M.N.A., Hossain, M.B., Socioeconomic Status of Pond Fish Farmers of Charbata, Noakhali, Bangladesh. *International Journal of Life Science Biotechnology and Pharma research.* 2(1): 356-365. 2013.

[2] DoF., 2012. Fish Fortnight Compendium. Department of Fisheries, Ministry of Fisheries and Livestock, Government of Peoples Republic of Bangladesh, 130-131pp

[3] Hossain, M.B., Amin, S.N., Shamsuddin, M., Minar, M.H., Use of Aqua-chemicals in the Hatcheries and Fish Farmers of Greater Noakhali, Bangladesh. *Asian Journal of Animal and Veterinary Advances.* **8(2):** 401-408. 2012.

[4] Begum, A., Khan, M.M.R., Nahar, K., Minar, M.H., Sultana, N., Khan, M.G.Q., Morphological and genetic variations in Wild and hatchery populations of gonia (*Labeo gonius*, Hamilton) using truss Measurement and allozyme markers. *International Journal of Life Sciences Biotechnology and Pharma Research.* **2(2):** 204-221. 2013a.

[5] Begum, A., Minar, M.H., Mahfuj, M.S.E., Begum, M., Monthly variation of biochemical composition of gonia (*Labeo gonius*) collected from Bangladeshi water. *International Journal of Life Sciences Biotechnology and Pharma Research.* **2(2):** 227-232.2013b.

[6] Begum, M., Minar, M.H., Weight-length relationships of koi (*Anabas testudineus*) along with condition factor fed on formulated feed. *Trends in Fisheries Research.* **1(2):** 1-6.2012.

[7] Kabir, K.M.R., Adhikary, R.K., Hossain, M.B., Minar, M.H., Livelihood Status of Fishermen of the Old Brahmaputra River, Bangladesh. *World Applied Sciences Journal.* **16(6):** 869-873.2012.

[8] Nath, P.C.D., Debnath, S.K., Sharmin, R., Benerjee, S., Faroque, M.G., Ali, M.M., A study on the fish biodiversity of Borulia haor, Nikli, Kishoregonj. *Int. J. BioRes.* **(3):**37-41.2011.

[9] Khan, M.S., Haq, E., Huq, S., Rahman, A., Rashid, S.M.A., Ahmed, H., Wetland of Bangladesh: A report. 1-79. 1990.

[10] Khan, M.A.R., Miah, M.I., Hossain, M.B., Begum, A., Minar, M.H., Karim R., Fish Biodiversity and Livelihood Status of Fishing Community of Tista River, Bangladesh. Global Veterinaria. 10 (4): 417-423. 2013.

[11] Chowdhury, M.S.N., Hossain, M.S., Das, N.G., Barua, P., Environmental variables and fisheries diversity of the Naaf River Estuary, Bangladesh *Coast. Conserv.* DOI 10.1007/s11852-010-0130-3. 2009.

[12] Paik, T.K., Chakraborty S.K., Ichthyofauna of east Singhbhum district, Jharkhand, India. *J. Aqua. Biol.* 18(2):55-60. 2003.

[13] Khan, E., Water and environment. In: Bangladesh: State of environment report 2000. Forum of Environmental Journalists of Bangladesh (FEJB), Segun Bagichha, Dhaka-1000. Pp 17-25. 2001.