FISHERIES AND SOCIO-ECONOMIC CONDITION OF FISHER’S COMMUNITY OF ESHULIA BEEL AT GOURIPUR UPAZILA UNDER MYMENSINGH DISTRICT

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ABSTRACT

The study was conducted to determine the present status of fisheries and socio-economic conditions of the fisher’s community of Eshulia beel at Gouripur upazila under Mymensingh district for a period from February to November, 2013. Relevant information and pertinent data were collected by personal observation and other three participatory methods such as questionnaire interview, focus group discussion (FGD) and cross-check interview. A total of 58 fish species belong to 18 families were identified in the catches of different gears. Among them 37 species were resident, 14 species were non-resident and 7 species were exotic. Thirteen different kinds of fishing gears were identified under 5 major groups including 5 nets, 3 traps, 2 hooks, 2 spears and khata/zag in the beel. It was found that 65% of the fishermen were Muslim and 35% were Hindu. Most of the fishermen belonged to the age group of 36-50 years. In case of education, 32.5% were illiterate, 40% can sign only, 15% of the fishers had literacy up to primary level, 7.5% had literacy up to secondary level and 5% had higher secondary and above. 75% of the fishermen’s houses are katcha, 17.5% are tinshed and only 7.5% are half building. About 5% of the fishermen had high (TK 100000-TK 200000) income; 42.5% had medium (TK 51000-TK 100000) income and 52.5% had low (TK 25000-TK50000) income. No fisheries management regulations were followed in the beel. Recommendations were made to improve beel fisheries management through fish stocking, habitat restoration and active community participation for sustainable catch.

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INTRODUCTION

Bangladesh is endowed with very considerable marine, estuarine and inland waters and has rich extensive fisheries resources with a wide variety of indigenous and exotic fish fauna (Rahman, 1994). Among them open water fisheries resources are very much important for fish production. There are 6.78 lakh ha close water bodies and 40.24 lakh ha open water bodies in our country. Among them 8.5 lakh ha are rivers and estuaries, 1.8 lakh ha Sundarban, 1.14 lakh ha beel, 28.32 lakh ha floodplains and 68,800 ha Kaptai lake (DoF, 2012).

Approximately 260 species of freshwater fishes, 475 species of marine water fishes, 25 types of tortoises and turtles, 150 species of water fowls, 50 species of reptiles, 24 species of mammals and 8 species of amphibians are found in Bangladesh (Ali, 1991; World Bank, 1991; MAEP, 1996). Fisheries sector contributes 4.43% to GDP and 22.21% to agricultural GDP. 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 livelihood (DoF, 2012). Among the vast inland fisheries resources, beels are more potential. Beel is one of the best natural habitats for the indigenous fishes of different food habits of Bangladesh. Among the inland capture fisheries the beel comprises an estimated area of 114,161 ha which is 2.63% of total inland fisheries. The average rate of production from beel is 714 kg/ha which can be increased manifold (DoF, 2012).

Although production from beel fishery increasing every year with a very small amount but several natural and anthropogenic causes observed in beels which causes lower production of fish. Eshulia beel at Gouripur upazila of Mymensingh district has been purposively selected as the study area, because its richness in fisheries resources. But unfortunately the fisheries resources have been declaiming day by day. The present research programmed was conducted to understand the types of different fishing gears used in fishing, quantity and quality of fish caught by each year through catch assessment and socio economic conditions of the people in the beel area. The present study was carried out in the Eshulia beel with the fishing activities in the beel area i.e. fish catch, duration of fishing and the use of fishing gears etc; present status of fisheries resources of the beel and to determine the socio-economic conditions of the fishers in the vicinity of the beel area; and to formulate the recommendation for effective management of the beel.

MATERIALS AND METHODS

Selection of the study area

Based on the problem and potentialities, I selected Eshulia beel in Gouripur upazilla under Mymensingh district. Eshulia beel (Figure 1) is a small beel which is 25 km east from the Mymensingh town. The study was conducted for a period from February to November 2013.

Figure 1. Location Map with the black marked indicates the study area of Eshulia beel in Gouripur upazila
Data collections
Data were collected both from primary and secondary sources. To collect data, simple random sampling method was followed in 40 fishermen in the Eshulia beel. For the present study, the PRA tool such as Focus Group discussion (FGD) was conducted with fishermen. After collecting the data through questionnaire interviews and FGDs, it was necessary to check the information by Cross-check interview for justification of the collected data.

Data processing and analysis
The collected data were coded, summarized, and processed for analysis. The analysis of collected data was mainly based on tabular description technique. A number of tables were prepared on the basis of aims and objectives of the study. Finally, tabulated data were analyzed and condensed by using averages, percentages etc. to obtain the results.

RESULTS AND DISCUSSIONS

Fish diversity of the Eshulia beel
During the study period, 14 species of non-resident, 37 species of resident and 7 species of exotic fishes were found in the Eshulia beel. Once those fish which were dominant become rare in the course of time highly endangered or extinct.

| Family      | Local name | Common name/English name | Scientific name          |
|-------------|------------|--------------------------|--------------------------|
| Cyprinidae  | Catla      | Catla catla              | Catla catla              |
|             | Rui        | Indian major carp        | Labeo rohita             |
|             | Mrigal     |                          | Cirrhinus migala         |
|             | Kal ibaus  | Kalbasu/black rohu       | Labeo calbasu            |
|             | Goinna     | Kuria labore             | Labeo gonius             |
|             | Silver carp| Chinese carp             | Hypoptalmichys molitrix  |
|             | Grass carp |                          | Ctenopharyngodon idella  |
|             | Carpio     | Common carp              | Cyprinza carpio var. communis |
|             | Mirror carp|                          | Cyprinus carpio var. speculatoris |
|             | Big head carp|                      | Aristochthys nobilis     |
|             | Rajputi/Thai sarputi|                  | Puntius gonioutos        |
| Cichlidae   | Nilotica   | Cichlid fish             | Oreochromis niloticus    |
|             | Thai panges|                          | Oreochromis mossabicus   |
| Siluridae   | Native Pangus |                    | Pungusius sutchi         |

Non-piscine diversity of the Eshulia beel
There are different non-piscine organisms were found in the Eshulia beel. Mollusks, Crustaceans, Amphibians, Reptiles, Arthropods were recorded during the study period.
Table 2. List of resident species recorded in Eshulia beel during study period

| Family          | Local name       | Common name / English name          | Scientific name        |
|-----------------|------------------|-------------------------------------|------------------------|
| Anabantidae     | Koi              | Climbing perch                      | Anabas testudineus     |
|                 | Chuna khailsha/Boicha | Goramy                             | Colisa sota            |
|                 | Khalisha/khailsha | Goramy                             | Colisa fasciatus       |
|                 | Ranga khailsha/ Patersa | Goramy                     | Colisha lalius         |
| Anguillidae     | Bamosh           | Fresh water eel                     | Anguilla bengalensis   |
| Bagridae        | Guizza/Guzi      | Giant river catfish                 | Mystus seenghala       |
|                 | Gulsha           | Catfish                            | Mystus cavasius        |
|                 | Tengra           | Catfish                            | Mystus vittatus        |
|                 | Bajari tengra    | Catfish                            | Mystus tengara         |
| Centropomidae   | Lalchanda        | Glass-perch                        | Chanda ranga           |
| Belonidae       | Kakila/kaikka    | Needle fish/Gars                   | Xenentodon cancila     |
|                 | Nama chanda/Lamba chanda | Elongate glass perchlet    | Chanda nama            |
|                 | Gol chanda       | Glass-perch                        | Chanda beculis         |
| Channidae       | Taki/Lati        | Snakehead                          | Channa punctatus       |
|                 | Shoal            | Snakehead murrel                   | Channa striatus        |
|                 | Gajar/Gajal      | Giant snakehead                    | Channa marulius        |
|                 | Cheng/Raga/ Telotaki/Gachua | Asiatic snakehead             | Channa orientalis      |
| Claridae        | Magur            | Walking catfish                     | Clarias batrachus      |
| Clupeidae       | Chapila          | Shad/Herring                        | Gudusia chapa          |
| Cobitidae       | Gutum            | Loach                              | Lepidocephalus guntea  |
| Cyprinidae      | Mola             | Barb/Mola carpet                    | Amblypharyngodon mola  |
|                 | Jatputi          | Spot fin Swamp barb                 | Puntius sophore        |
|                 | Kanchan punti    | Rosy barb                          | Puntius conchonius     |
|                 | Tilpunti         | Barb                               | Puntius ticto          |
|                 | Darkina          | Barb                               | Rasbora daniconius    |
|                 | Choto Darkina/Derka | Barb                  | Esomus danricus        |
|                 | Narkali chela/katari | Minnow/Barb           | Salmostoma bacaila    |
| Cyprinodont-idea | Kanpona/Technoukka | Top-minnow                        | Aplocheilus panchax    |
| Gobiidae        | Balla/bele       | Goby                               | Glossogobius guiris    |
| Heteropneu-stidae | Shing          | Stinging catfish                   | Heteropeueses fossilis |
| Mastacembelidae | Chirka           | Striped spiny eel                  | Mastacembelus pancaulis|
|                 | Bara baim/Shal baim | Tire-track spiny eel           | Mastacembelus armatus  |
| Siluridae       | Madhu pabda      | Catfish                            | Ompok pabda            |
| Nandidae        | Bheda/Meni       | Mud perch/Mottled nandus           | Nandus nandus          |
| Notopteridae    | Chital           | Featherback/knife fish             | Notopterus chitala     |
|                 | Foli             | Bronze feather back                | Notopterus Notopterus  |
Table 3. List of extinct species in Eshulia beel

| Family       | Local name       | English name          | Scientific name          |
|--------------|------------------|-----------------------|--------------------------|
| Cyprinidae   | Dhela            | Cotio                 | Rohitee cotio            |
| Chacidae     | Gilarchaki/Chaka/Gangeri | Indian chaca / Square-head catfish | Chaca chaka            |
| Belonidae    | Ek-thota/Ektuti  | Wrestling halfbeak/half beaks | Dermogeneys pussilus    |
| Cyprinidae   | Sarputi/Sarna puti | Olive barr            | Puntius sarana           |
| Bagridae     | Ayre             | Long-whiskered catfish | Mystus aer              |
| Anabantidae  | Neftani          | Indian paradise fish  | Ctenops nobilis          |
| Cyprinidae   | Kash khaira      | Indian glass-barb     | Chela laubuca            |

Table 4. List of non-piscine organisms recorded in Eshulia Beel, during the study period

| Group         | Family               | Local name | English name | Scientific name                                      |
|---------------|----------------------|------------|--------------|------------------------------------------------------|
| Prawns        | Palemonidae          | Gura icha  | Small prawns | Macrobrachium lamerril                                |
|               |                      | Chatka chingri | Freshwater prawn | Macrobrachium malecolmsonii                      |
|               |                      | Golda chingri | Giant freshwater prawn | Macrobrachium rosenbergii                      |
| Mollusks      | Pelidae              | Baro shamuk | Apple snail  | Pila globosa                                         |
|               | Viviparidae          | Choto shamuk | Small snail  | Viviparus bengalensis                                 |
|               | Melanoididae         | Lamba shamuk | Long snail   | Melanoides tuberculosis                               |
|               | Eulamellibranchidae  | Lamba jhinuk | Long bivalve | Lamillidens marginalis                               |
|               | Corbiculidae         | Gol jhinuk  | Round bivalve | Corbiculata sp.                                      |
| Arthropods    | Patamonidae          | Kakra      | Crab         | Potamon sp.                                          |
|               | Belostomidae         | Katua poka | Giant water bug | Belostoma sp.                                       |
|               | Choto poka           | Choto poka | Water bug    | Abedus sp.                                           |
|               | Nepidae              | Lomba poka | Ranatra      | Ranatra sp.                                          |
|               | Ghurni poka          | Ghurni poka | Water scorpion | Nepa sp.                                              |
|               | Gerridae             | Geris      | Geris        | Gerris sp.                                           |
| Amphibians    | Sona bang            | Sona bang  | Indian bull frog | Rana tigrina                                        |
|               | Gecho bang           | Gecho bang  | Tree frog     | Rhacophorus leucomystex                              |
|               | Kuno bang            | Kuno bang   | Common Toad   | Bufo melanostictus                                   |
| Reptiles      | Dhura                | Dhura      | Naja          | Naja naja                                            |
|               | Gui                  | Gui        | Lizard        | Varanus bengalensis                                  |

Aquatic vegetation or plant biodiversity

A total of 16 species of aquatic vegetation under 5 groups recorded during the study period mostly dominant by free floating weed Eichornia crassipes and submerged weed Vallineria sp. (Table 5).
Table 5. List of aquatic vegetation in Eshulia beel recorded during the study period from February to November 2013

| Type           | Family             | Local name/English name  | Scientific name          |
|----------------|--------------------|--------------------------|--------------------------|
| Leafly floating | Nymphaeaceae       | Sada shapla              | *Nymphaea nouchali*      |
|                |                    | Lal shapla/Red waterlily | *Nymphaea rubra*         |
|                |                    | Shaluk/waterlily         | *Nymphaea lotus*         |
| Free floating  |                    | Kachuripara/Water hyacinths | *Eichhornia crassipes* |
|                | Araceae            | Topa pana/Water lettuce  | *Pistia stratiotes*      |
|                | Lemnaceae          | Khudipana/Duckweed       | *Lemna minor*            |
|                | Salvinia            | Kutipana/waervalvet      | *Azolla pinnata*         |
|                | Nelumbonaceae       | Padda                    | *Nelumbo nucifera*       |
| Submerged      | Hydrocharitaceae    | Pataseola/Eel glass      | *Vallisneria spiralis*   |
| Emergent       | Convovulaceae       | Dholkaimi                | *Ipomoea fistulosa*      |
| Spreading      | Araceae            | Kachu                    | *Colocasia esculenta*    |
|                | Onagraceae          | Keshordam                | *Ludwigia adscodens*     |
|                | Convolvulaceae      | Kalmishak                | *Ipomoea aquatica*       |
|                | Compositaceae       | Helencha                 | *Enhudsona fluctuans*    |
|                | Compositaceae       | Malancha                 | *Enhydra sp.*            |
|                | Oxalidaceae         | Amrul shak               | *Oxalis corniculata*     |

Fishing gears used in the Eshulia beel

The fishing gears found in the study area were classified into five groups namely net, trap, hook, FAD (Fish Aggregation Devices) and wounding gear or spears. Each of these types had again been classified into a number of sub-types (Table 6).

Table 6. Fishing gears used in Eshulia beel

| Gear type                  | Gear name                                      |
|---------------------------|-----------------------------------------------|
| Gill net                  | Current jal, Veshal jal, Moiya jal (onno para) |
| Seine net                 | Ber jal                                       |
| Nets                      |                                               |
| Cast net                  | Jhaki jal                                     |
| Lift net                  | Dharma jal                                    |
| Push net                  | Thela jal                                     |
| Traps                     | Bitte chai                                    |
|                          | Icha chai                                     |
| Hooks                     | Chip borshi                                   |
|                          | Chara borshi                                  |
| Wounding gear/Spears      | Teta without hook                             |
|                          | Teta with hook                                |
| FAD (Fish Aggregation Devices) | Khata/Zag                              |
Socio-economic condition of fishers

Socio-economic condition of the fishers was studied following approach which comprised of human capital, physical capital, financial capital and social capital.

Human capital

Human capital represents the skill, knowledge, ability to work and good health, family size, educational level, religious status that together enable people to pursue their livelihood strategies.

In the present study, about 35% and 65% fishermen were found to be Hindus and Muslim. The family members of fishermen in the Eshulia beel were varied between 2 and 7. About 35% of the fishers had medium family, 22% with small family where 43% of fisher had large (family 9.a). In the study area, the fishermen were grouped into 3 age groups based on their age limit. These groups were young (20-35), middle aged (36-50) and old (above 51 years). Out of the total fishermen, around 75% of the fisherman related to fishing belong to the middle age group and elderly people and about 25% of fishermen belong to young age group (Figure 2.b). There was 32.5% of fishermen had no education, 40% of fishermen can sign only, 15% of fishermen were up to primary level of education, 7.5% were secondary level and 5% were higher secondary level and above was lack of awareness about education and there is no well-developed educational infrastructure in the Eshulia beel areas (Figure 2.c).

Most of the dwellers of the Eshulia beel area are very poor; In the study area it was found that 50% of toilets were katcha, while 42.5% were semi-pucca and only 7.5% were pucca (Figure 2.d). The physical capital of fishermen is transport, drinking water supply, sanitary facilities, shelter, roads, market, electricity etc (DFID, 2000). In the study area, 75% of fishermen’s house was katcha, 17.5% were tinshed and only 7.5% were half building (Figure 2.e). The study showed that around 80% of the fishermen household used tube-wells for drinking water, while 20% used of kua water due to arsenic and other problems in tube-wells (Figure 2.f).
Fish marketing channel
The status of fish marketing channel around Eshulia beel is depicted exist in the study area of the total interviewed (40), most of them sold their fish by using marketing channel of Fishermen-Arotder-Wholesaler-Retailers-Consumers and 25% used marketing channel of fishermen-Consumers (Table 7).

Table 7. Socio-economic condition of the respondents in the study area

| Types of Character     | Respondents Facilities                      | Number of Respondents | % of respondents |
|------------------------|---------------------------------------------|-----------------------|------------------|
| Fish marketing channel | Fishers-Arotder-Wholesaler-Retailers-consumers | 30                    | 75               |
|                        | Fishers-consumers                           | 10                    | 25               |
| Training               | Trained                                     | 22                    | 55               |
|                        | Non-trained                                 | 18                    | 45               |
| Loan received          | Received loan                               | 25                    | 70               |
|                        | Don’t received loan                          | 15                    | 30               |
| Annual income          | Low income                                  | 21                    | 52.5             |
|                        | Medium income                               | 17                    | 42.5             |
|                        | High income                                 | 2                     | 5                |

Social capital
Almost all fisher community is disadvantaged in social capital such as the networks, groups, trust, access to institutions etc. In recent years, DoF, NGOs and other institutes have been providing training to the fish farmers. From the present study, it was found only 55% received formal training and 45% were non-trained (Table 7).

Financial capital
Financial capital of fishers represents the savings, credit etc. In the area of Eshulia beel the main source of income of the fishermen are fishing. From the survey, it was found that 30% of the fisher don’t received loan while the 70% of the fisher received loans.

The average amount of credit received by fishers was estimated at TK 7,000 to TK 12,000 the study showed that Most of the respondents (72%) who received financial assistance were able to repay the loan and only 28% were unable to pay back the loan due to loss of agricultural production, lack of money, low catch and due to poverty such as lack of food, clothes and illness (Table 7).

Annual income
About 5% of the fishermen had high (TK 100000-TK 200000) income; 42.5% had medium (TK 51000-TK 100000) income and 52.5% had low (TK 25000-TK50000) income. The distribution of annual income of the respondents is presented in Table 7. Findings indicate that majority 52.5% of the respondents had low income and 5% of the respondents had high income.
CONCLUSION

The present investigation revealed that the diversity of fishes in the Eshulia beel at Gouripur upazilla under Mymensingh district. The study was carried out with a view to observe the natural abundance of fishes as well as the uses of fishing gear and the socio-economic condition of the fishermen of the beel. Socio-economic conditions of Eshulia beel fishermen were studied in terms of religious status, age structure, educational status, health facilities and drinking water facilities, housing condition, sanitary facilities and monthly income. Socio-economic conditions of the fisher’s communities were not satisfactory. Fishermen faced several constrains. The fishermen have no access to scheduled banks for loans due to the absence or insufficient collateral security. So, some beel management policies should be adopted to protect the species which are at the degree of extinction and to recover sustainable production of the beel. For the protection of fish biodiversity of Eshulia beel the following measures are recommended.

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CONFLICT OF INTEREST

There is no conflict of interest about this manuscript.

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