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## Fishing gears and crafts study of Sugandha River

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### Abstract

Sugandha river is a beautiful river in Bangladesh. Different types of gears are used in the river to harvest fish species. An investigation was undertaken to know the status of fishing gears and their impacts on fresh water fishes for a period of 11 months from January 2015 to November 2015. The study revealed a total of 11 fishing gears covering 11 groups of nets. Results of the study revealed that the ecology of the Sugandha river is in great threat due to excess fishing pressure from illegal, harmful fishing gears. Therefore, Government and relevant Non- Government fisheries agencies can be taken a necessary action through public awareness and education to protect the ecosystem of freshwater fish species and develop a more effective conservation strategy.

**Keywords:** Sugandha river, freshwater fish, fishing gears, fishing crafts, Bangladesh

### 1. Introduction

Bangladesh is a riverine country, having about more than five hundred (500) <sup>[2]</sup> in number rivers throughout the country. It's carried out the fourth position in fish biodiversity of Asia. Sugandha River is a beautiful zigzag river in Bangladesh. It's another name is 'Basonda Khal'. Sugandha is a coastal river Barisal Division of Bangladesh. The length of this river is 21 km (according to another opinion: 30km), the average width is the 400-1000m and the depth is 10m (dry season) to 19m (rainy season) <sup>[1, 2]</sup>. It flows eastern near Shayestabd and falls into the Biskhali River then after the Bay of Bengal after meeting with the Megna River at Sahbazpur channel in Bhola. Another offshoot of this river flows south-southwest as the Kirtankhola up to Dopdopia union at Nalchity Upazila keeping the Barisal town on its west bank. The river is the shelter of wide-ranging fish fauna. The rivers influence the lifestyle of vulnerable people living along with near the coast of the river. Many fishing crafts and gears are operated in the Sugandha River.

Fishing gear is an equipment and partly mechanical device used to catch, collect or harvest fish. The major categories of fishing gears are habitually used in Bangladesh such as Gill net Sine net, Set bag net. The fishing gear has various types and names such: fishing nets, fishing traps, hooks and lines. Few types of materials are used to make these fishing gears include twine, plastic, ropes, steel wire ropes, purse rings, polyester, polythene, nylon, cotton, polypropylene, mixed fibres, floats and sinkers, bamboo, wood, etc. The structure and size of the gear depending on the use of gears and the environmental condition of the River constructions.

No craft and gear have been fixed yet by the government for inland waters to build a sustainable fishing management structure. Many gears are now indiscriminately catching of juveniles and legal size. Thus, unplanned use of gears, many vulnerable and endangered fish species will be lost from the natural recruitment process in the riverine waters. In that context preparing the list of legal-illegal gears is very important for grown-up the juveniles safely.

Few research works have been conducted on fishing gear and crafts in Sugandha River and also no satisfactory information in the scientific literature. Because of all, the current study was an attempted to know the category of various fishing crafts and gears used traditionally and commercially in the rivers, determine the characteristics of fishing gears and identify the safest, detrimental gears based on their mesh size, catch and mode of operation in Sugandha River.

## 2. Materials and Methods

### 2.1 Study Area

The present research area was Sugandha River at Jhalakathi district under Barisal Division of Bangladesh. To achieve the output of the existing research works, specific data were collected fortnightly basis, twice a month for 11 months from January 2015 to November 2015.

### 2.2 Data Collection System

#### i) Data collection

The research data were collected from the local fishing gear market, fish landing center and local fishermen by interviews (FGD) and personal communication (Face to face). All-over cross-check Interviews (CI) were conducted with key informants (KI) such as Upazila Fisheries Officer (UFO), District Fisheries Officers (DFO) and relevant GO and NGO officers and staffs.

#### ii) Fishing Gear Identification

Fishing gears (Mesh size, length, width, height, materials, gear size, building materials, Gear types) and its operating system (operation mode, gear number, frequency, time of operation, fish species caught, etc) were seen by direct observation.

### 2.3 Data analysis

Data were presented graphical Image. Collected data were analyzed by Microsoft Excel.

## 3. Results

### Fishing Gears Identification

From the study, total 11 fishing gears were identified in Sugandha River such as following below (table-1 and figure 1-6).

#### i) Chandi jal

Chandi jal is one kind of gill net operated on kosha boat in Sugandha River. The length and width are 600 to 700 m and 10 to 12 m. having a mesh sizes 3 to 4cm. The net is made of nylon rope. Plastic floats and burned soil sinkers are attached to the upper and lower part of net. The net have a standing position in water current and the fish is gilling in the mesh of net. Catch per unit effort per hall of this net is 120 to 150 kg. The net is operated in the whole year except the fish banning period. Mainly Hilsa (*Tenualosa ilisha*) is target species of this net. Another information of about chandi net are shown in below.

#### ii) Poa jal

Poa jal is a species-wise gill net which made by a nylon rope. The length and width of this net are varied from 60 to 70 m and 3.6 to 4.5 m. The net shape is rectangular and the mesh size of the net is 2.5 to 3cm. The net is operated by 2 to 3 persons from the kosha boat in a day and night. Plastic floats and burned soil sinkers are attached with the upper and lower part of the net. The net have a standing position in water current and the fish is gilling in the net's mesh. CPUE of this net is 120 to 150 kg per hall. The net is operated in the whole year except the fish banning period. Poa (*Otolithoides pama*) is target species of this net. Another information are provided with table and figure.

#### iii) Moi jal/Tana jal

Moi jal is a small fishing gear constructed by polyamide

mono-filament nylon rope. Its length range of 2 to 3 m, width 1.2 to 2.2 m and mesh size 1 to 3 cm. The upper end of the net are tightening with a horizontal bamboo pole and the lower part of the net contains many pockets with iron Pilo. Upper part jointly 15-20 ft. a long bamboo pole is worked as lifts operator in water. It is operated on a Kosha boat by using a long rope which stays with the bottom level of the river. This net is cheaper than other nets. Prawn is the target species of this net and whole of the year this net is operated. Catch per unit effort range is 5 to 20 kg.

#### iv) Thela Jal

Thela jal is a triangular-shaped push net operated by 1 person. It is made of polyamide nylon rope. It have an extended handle of two bamboo poles, one is longer than other and fixed at an angle of 30°. Its two arms are 2 to 3 m long and front side is 1 to 1.5 m long having a mesh size of 0.2 to 1.0 cm. The triangular portion of the net is lowered and pushed forward along the bed of the shallow water areas. The net is used at all time of the year and one person can operate this net. Small fish is caught by the net.

#### v) Jhaki jal/Khapla jal

The net is a conical shape having a mouth diameter started 3 or 6 m upper part long and 6 or 12 m lower part. One fisherman can operate this net. CPUE of this net is 1 to 5 kg. The mesh size of the net is 0.625 to 1.25 cm. The net is known as khapla, jhanki, chlatki, Dhundi, kheo, teora and pheka in Bangladesh.

#### vi) Chor ghera Jal

Chor Ghera jal is a special net operated by 2-3 fisherman. this type of nets are used to round with bamboo staffs a particular area of a "Chor" or riverside. There are tidal water enters net during high tide and when low tide is coming, waterfalls down then trapped fish are found in low high water at the 'chor bed'. Then the remained fishes are collected.

#### vii) Current Jal

Current jal is a rectangularly shaped monofilament gill-net with a mesh size range is 2.5 to 4. The length of the net is 20 to 200 meters and the width is 1 meter and operated by 1 or 2 fishermen. Floats are used at the headline of the net whereas Sinkers are attached to the ground line of the net for earthen weights. Optionally few current nets are fixed in the water with two bamboo poles like a large wall of the net and it is set on the borderline or in shallow water of the estuary. The CPUE of the net is 1-8 kg. Hilsa (*Tenualosa ilisha*), Bata (*Labeo bata*) and Ayre (*Mystus aor*), Pangus (*Pangasius pangasius*) and Poa (*Otolithoides pama*) are the main species caught by the net.

#### viii) Badha Jal

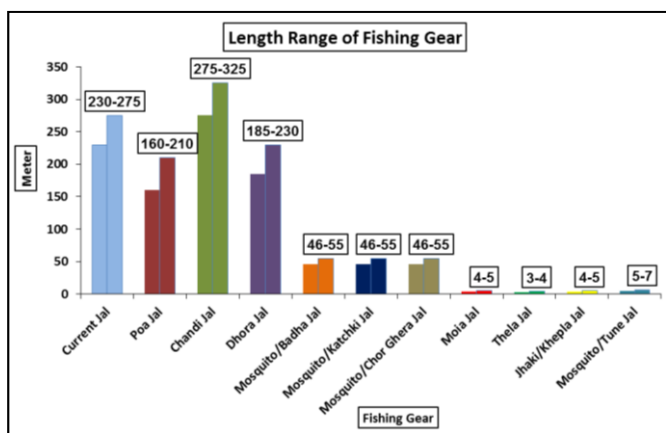
Badha jal is gill net which have 2 to 4-inch mesh sizes and CPUE is 2 to 5 kg. Dhora jal is also known as Hilsa net. Hilsa is the target species of this net operated by 4 or 5 fishermen.

#### ix, x & xi) Dhora, Katchki Jal & Tune jal

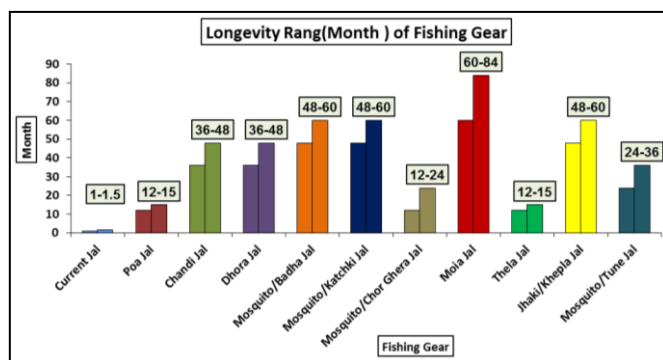
Dhora jal is a rectangular shaped net which have 0.5 to 1.0cm Mesh size and CPUE 2 to 5 kg. Badha jal is also known as Mosquito Net. Fry of all freshwater fish is the target species of this net operated by 1 or 2 fishermen. Activities of Katchki & Tune jal are same as dhora jal. Those are also known as Mosquito Net.

**Table 1:** Information of gear with details information used in Sugandha River of Jhalokathi District

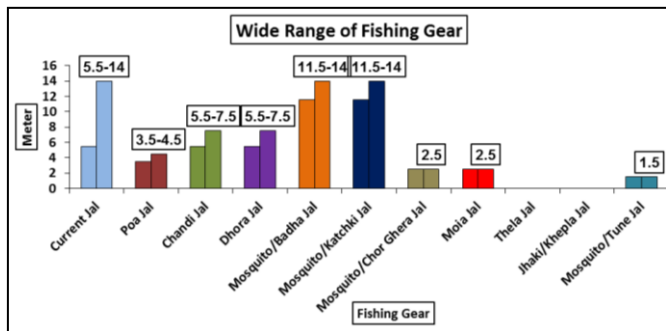
SL No	Gear Type	Gear Name (Local)	Material used	Type Name of craft used (Nouka/Boat)	Operational Fishers	Species caught (Local Name)
1.	Gill Net (Drift)	Current Jal	Polyamide	Kosa, Dingi	2-3	Jatka, medium & large Hilsa, Poa, Topsi, Tengra, Fesha, Bata, Ayre, Pangus, and Poa
2.	Gill Net (Drift)	Poa Jal	Nylon	Kosa	2	Poa, Tulardadi, Topsi, Tengra
3.	Gill Net (Drift)	Chandi Jal	Nylon	Kosa	4	Mainly Hilsa
4.	Fixed Gill net	Dhora Jal	Nylon	Dingi	4	Mainly Hilsa
5.	Mosquito Net (Fixed-bottom)	Badha Jal	Nylon	Kosa	2	Fry of all fish available in river
6.	Mosquito Net (Surface -Fixed)	Katchki Jal	bobbin	Kosa	2	Fry of all fish available in river
7.	Mosquito Net (Fixed)	Chor Gora Jal	bobbin	Kosa, Dingi	2	Chringri, Poa, Bata, Topsis, Dorgi, Bele, Tengra
8.	Drag/Push Net	Moia Jal	Nylon	Kosa	2	Mainly Chingri
9.	Drag/Push Net	Thela Jal		-	1	Chringri, Bele, Dorgi, Tengra
10.	Cast Net	Jhaki/Khepla Jal	Nylon	Dingi	2	Maily Sola chringri, Bele, Dorgi
11.	Mosquito Net (bottom-Fixed)	Tune Jal	Nylon	-	1	Chringri, Bele, Shol, Taki, Shing



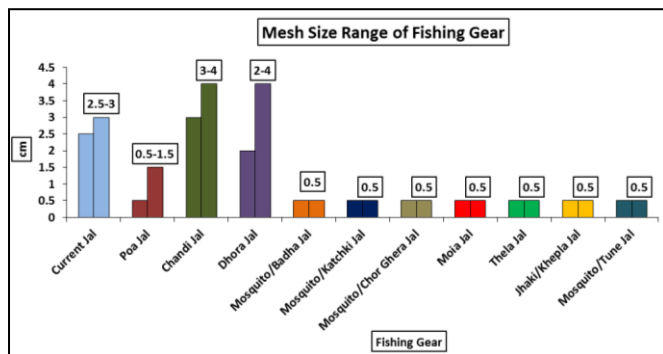
**Fig 1:** Length range of fishing gear in the Sugandha River.



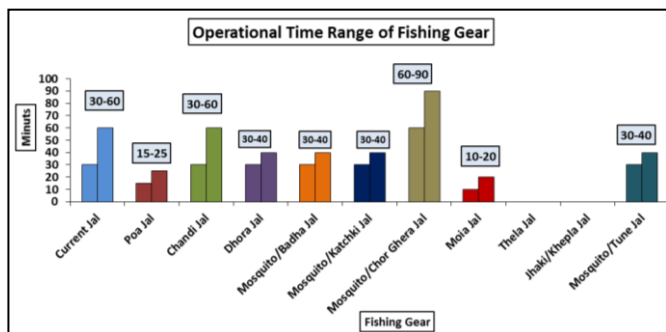
**Fig 4:** Longevity Rang (Month) of Fishing Gear in the Sugandha River.



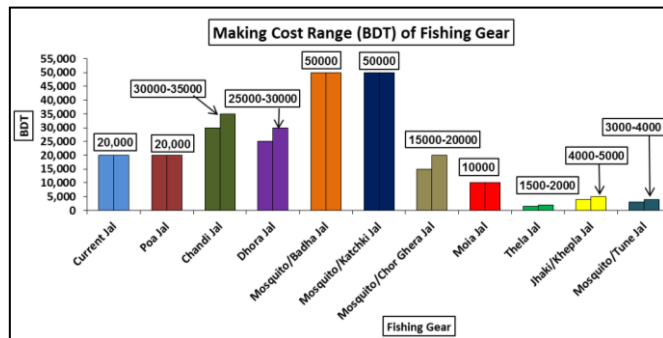
**Fig 2:** Wide range of fishing gear in the Sugandha River.



**Fig 5:** Mesh Size Range of Fishing Gear in the Sugandha River.



**Fig 3:** Operational time range of fishing gear in the Sugandha River.



**Fig 6:** Making Cost Range (BDT) of Fishing Gear in the Sugandha River.

#### 4. Discussions

Most of the fishing methods in the river area were traditional and simple. No craft or gear has been prescribed yet by the government for inland waters. The type of nets, net length, net breadth and net mesh size varied significantly, depending on the local fishing operations, as well as the abundance of the fish [15]. Some gears are developed and modified on the basis of the choice of the fish traders for more harvest. More or less some differences are shown in nets shape, mesh size, operation type, manpower number, net price, etc. The freshwater fishing gears of traditional types are used for a long time with no modification [3]. In this study, different fishing gears and operation type & technique were observed and classified into eleven (11) nets. The fishing gears operation type & technique, cost, and related information are presented in Table 1, Figure 1-6. It is remarkable that, more or less various harmful net are used in about all river of Bangladesh by fisherman and most of gear technique and operation are about same [4-15].

#### 5. Conclusion and Recommendations

Sugandha River plays an important role by providing a considerable amount freshwater fish to the local consumption and other parts of the country as the main source of protein. It is worse than numerous illegal and banned fishing gears were used to harvest fish species from the Sugandha river without considering breeding seasons of freshwater fish species. Hence it is recommended that like other important river fishing regulation should be implemented in the studied river to protect and conserve the existing important freshwater fishes. It is observed that the local fisher's community followed none fishing regulations such as they habituated to use different harmful fishing net like chorghera net, badha jal, mosari net, current net, etc. Thus, for sustaining the biodiversity, fishing regulation should be implemented in the Sugandha River. Government institution along with relevant Non- Government fisheries agencies must take action through public awareness and education to protect the ecosystem of these valuable fish species and develop a more effective strategy as conservation steps. To increase fish abundance and to recover some endangered fish species from the Sugandha River, A action plan (fish sanctuary establishes in the different location of the river, a fishing ban for the harmful fishing net and release the fish fry) should be taken immediately. So to develop sustainable management action plan, determination of effective mesh size of selective gear and their techniques, fishing efficiency etc. are the most important for fish production from open water fishery.

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