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# Study on the catch composition of cast net used in the Bishkhali River under Bamna Upazilla in Barguna district Bangladesh

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**Abstract**
The present study was conducted in the Bishkhali River under Bamna Upazilla in Barguna district to assess the catch composition of cast net in this river. The study was carried out for a period of eight months from July 2011 to February 2012. A total of 16 species of fishes were caught in cast net in the study period. During the study period it was observed that Motka chingri (*Macrobrachium malcomsoni*) was the dominant species contributed (43.70%) of total catch (by number of basis). The second dominant species was Punti *(Puntius ticto*) contributed (16.30%) of the total catch (by number basis). In weight basis Rui (*Labeo rohita*) was dominant contributed (26.40%). Then Baim (20.00%), Punti (12.00%), and Motka chingri (4.21%) were dominant. In the study period Motka chingri was dominated by 46.15%, 34.48% and 43.47% in the month of July, August and September respectively on the basis of number.

**Keywords:** catch composition, cast net, bishkhali river

## 1. Introduction
Bangladesh is a riverine country, having 700 rivers including tributaries flow through the country and constituting a waterway of total length of about 24,140 km [8]. Bangladesh is an agro-based riverine country with a huge delta of water resources. The country act as a drainage outlet for a vast river basin complex made up of the Ganges-Brahmaputra-Meghna river system and rich in various fisheries resources [13, 17]. Fisheries sector plays a significant role and main source of animal protein, employment opportunities, food security, foreign incomes and socio-economic improvement [2, 3, 14, 19]. This sector contributes 3.69% to GDP and 23.12% to agricultural GDP. Fish supplements to about 60% of our daily animal protein intake. About 11% of the population is dependent directly and indirectly on the fisheries for their living [9]. In Bangladesh, there are two sources of fisheries such as inland and marine fisheries. The inland fisheries again include capture fisheries and culture fisheries. There are about 15 lakh ponds in Bangladesh which covers about 3.71 lakh hectare and 2400 km long rivers which cover about 8.53 lakh hectares [6]. Besides these there are about 11 thousand beels 5,488 hectare baors, 68,800 hectare Kaptai Lake which cover an area of 1.14 1akh hectare. About 1.77 lakh hectare Sundarbankhari area and 28.10 lakh hectare flooded area [7].
In Bangladesh, there has a wide variety of fish species both freshwater and marine water. Among these, freshwater fish species 260, marine fish species 475, freshwater prawn species 24. Marine shrimp species 36 and exotic fish species 12. Total Bangladesh is a land of rivers. A network of rivers of which the Padma, the Meghna, the Jamuna, the Testa, the Brahmaputra, the Shitalakshya, the Surma and the Karnafully are important and their tributaries numbering about 230 with a total length of about 24,140 km Criss-cross the country and eventually flow down to the Bay of Bengal [4]. Bishkhali River has rich fishing resources which are the essential part not only for fishermen but also for the people living surrounding this River. It provides natural spawning grounds and nursery grounds for many commercially important species of aquatic biota and a significant portion of the country's fisheries production is dependent on this coastal river similar to [11]. These provide direct and indirect jobs and economic benefits relation to population. After meeting domestic demand fish are transported to various districts to contribute in the economy of Bangladesh. The riverine resources are declining day by day due to lack of proper management policy, over-exploitation and unplanned establishment of flood control and drainage projects (FCD), and flood control, drainage and irrigation projects (FCDI). Moreover, due to the rapid growth of population and expansion of agricultural, irrigation, domestic and industrial activities and municipal wastes an unbalanced heavy pressure has been put on the fishery resources of the rivers over the decades [12]. Different types of fishing gears are operated in Bishkhali River. Among these, cast net is a common type of gear operated in this river.

## 2. Materials and Methods
### 2.1 Study area
The present study area was Bishkali River located at Bamna upazila (1. Bamna union, 2. Dauatala union and 3. Ramna union) under Barguna district in Bangladesh (Fig. 1). Bamna Upazila (Barguna district) area is 101.05 sq km, located in between 22°11' and 22°21' north latitudes and in between 90°00' and 90°07' east longitudes. It is bounded by Kanthalia on the north, Patharghata and Barguna sadar upazilas on the south, Bishkhali river and Betagi upazila on the east, Mathbaria upazila on the west. The Bishkhali receives the water of the Madhumati and Katcha through the Kaukhali and the Gabkhan Khal (canal) joining with the river near the meander. The river maintains a connection with the Burishwar river system through the Bakdugh, Ayla, etc at the lower reach of Bamna upazila and falls

into the Bay of Bengal through the mouth of the Baleswar-Haringhata at 13 km down of Patharghata. The total length of the river is 96 km. The average width of the river from its origin to first 30 km is about 1 km and the rest is about 2 km. The average depth is about 16 m [5].

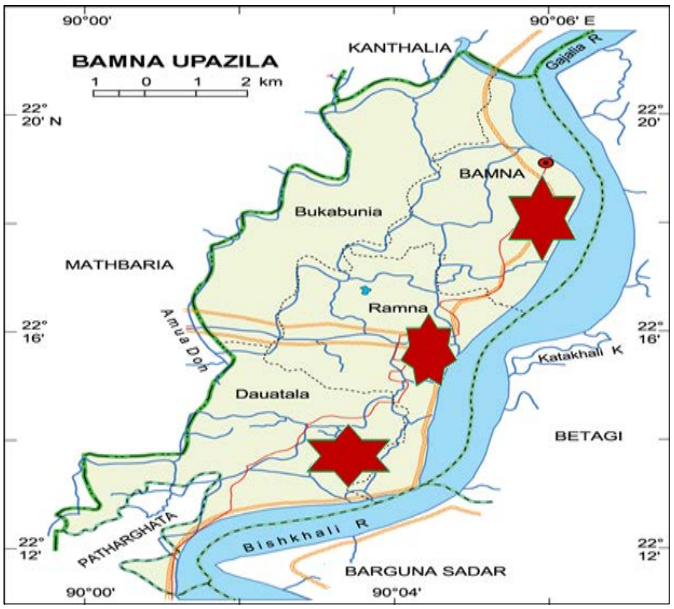


**Fig 1:** Study area in Bishkali River (Bamna Upazilla)

### 2.2 Data collection

The study was conducted for a period of eight months from July 2011 to February 2012. Interviews were conducted through face to face interview method by using semi- structured open ended questions. Cross-check Interviews (CI) were conducted with key informants such as Upazila Fisheries Officer (UFO), District Fisheries Officers (DFO) and relevant GO and NGO officers and staffs.

### 2.3 Data Analysis

This study area covers a large water bodies, catching a huge amount of different fish. The collection data were coded, summarized and processed. The first step was to look into data of each and every interview schedule to ensure consistency and similarity. Processing and editing of the data were done. After completing the pre-tabulation task processed data were transferred to a master sheet to facilitate tabulation. After completion of the pre-tabulation task, actual tabulation work was started. Finally, tabulated data were analyzed and condensed by using averages, percentages etc. to obtain the results. Mainly tabular analysis technique was used in this study. Data were presented mostly in the tabular and graphic form, because of their simple collection technique, widely used and easy to understand. Collected data were analyzed by Microsoft Excel and SPSS version-20.

## 3. Results

During the study period a total of 16 species of fishes were caught in cast net. Among these species Motkachingri (*Macrobrachium malcomsoni*) was the most dominant species in cast net round the study period. The other dominant species were Punti (*puntius ticto*) and Chama chingri (*Prapenaeus cromandelia*) respectively in the study period. A list of fish species were caught by cast net is given in (Table 1).

**Table 1:** A list of fish species were caught by cast net

| S. No. | Group name | Local name | Scientific name |
|---|---|---|---|
| 1 | Decapoda | Motka chingri | *Macrobrachium malcomsoni* |
| 2 | Cyprinidae | Punti | *Puntius ticto* |
| 3 | Decapoda | Chama chingri | *Prapenaeus cromandelia* |
| 4 | Gobiidae | Bele | *Glossogobius giuris* |
| 5 | Mastacembelidae | Baim | *Mastacembelus armatus* |
| 6 | Hemiramphidae | Akthota | *Dermogeny spusilla* |
| 7 | Bagridae | Gulsa | *Mystus vittatus* |
| 8 | Polynemidae | Ramsos | *Thrys sapurava* |
| 9 | Osphronemidae | Khalisha | *Colisa fasciata* |
| 10 | Decapoda | Golda chingri | *Macrobrachium rosenbergii* |
| 11 | Cyprinidae | Mola | *Amblypharyngodon mola* |
| 12 | Schilbeidae | Baspata | *Pseudeutropius atherinoides* |
| 13 | Gobiidae | Dogri | *Taenioides cirratus* |
| 14 | Siluridae | Pabda | *Ompok pabda* |
| 15 | Ambassidae | Chanda | *Chanda nama* |
| 16 | Cyprinidae | Rui | *Labeo rohita* |

### 3.1 Seasonal variation of catch composition

In the study period, data was collected on the basis of number of fishes were caught and the weight of fishes. Variation of catch composition in the study period has been discussed below:

**a) Seasonal variation of catch composition (on the basis of number) in the study period**

On the basis of number, the most abundant species of cast net was Motkachingri (*Macrobrachium malcomson*i) contributed (43.70%) of the total catch in the study period. The other dominant species were Punti (*Puntius ticto*) contributed (16.3%) and Chama chingri (*Prapenaeus cromandelia*) contributed (11.11%) of the total catch respectively during the study period. In the study period Motkachingri was dominated by 46.15%, 34.48% and 43.47% in the month of July, August and September respectively on the basis of number. In the other months catch of motkachingri was also high in cast net but the amount of catch was comparatively low. Variation of catch composition (on the basis of number) in the study period is shown in (Table 2 and Fig. 2).

**Table 2:** Seasonal variation of catch composition on the basis of number

| Fish Name / Month Name | Motkachingri (no.fish) | Punti (no.fish) | Chama Chingri (no.fish) | Bele (no.fish) | Baim (no.fish) | Akthota (no.fish) | Golda (no.fish) | Ramsos (no.fish) | Khalisha (no.fish) | Mola (no.fish) | Baspata (no.fish) | Dogri (no.fish) | Pabda(no.fish) | Chand(no.fish) | Gulsa (no.fish) | Rui(no.fish) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July | 12 | 7 | - | 1 | 1 | 1 | - | - | 2 | - | - | 2 | - | - | - | - |
| August | 10 | 8 | 4 | - | - | - | - | - | 1 | - | 1 | 2 | - | 3 | - | - |
| September | 10 | - | 6 | - | - | - | - | - | - | 6 | - | - | 1 | - | - | - |
| October | 7 | - | - | 1 | - | - | 1 | - | 1 | - | 2 | - | - | - | 2 | - |
| November | 7 | 1 | - | - | - | - | - | - | 1 | - | - | - | - | 1 | 1 | - |
| December | 6 | 2 | - | - | - | - | - | 1 | - | - | - | 1 | - | - | 1 | - |
| January | - | 1 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| February | 7 | 3 | 5 | - | - | - | - | - | - | - | - | - | 2 | - | 1 | - |
| Total | 59 | 22 | 15 | 3 | 1 | 1 | 1 | 1 | 5 | 6 | 3 | 5 | 3 | 4 | 5 | 1 |
| % of Fish | 43.70 | 16.3 | 11.11 | 2.22 | 0.74 | 0.74 | 0.74 | 0.74 | 3.70 | 4.44 | 2.22 | 3.70 | 2.22 | 2.96 | 3.70 | 0.74 |

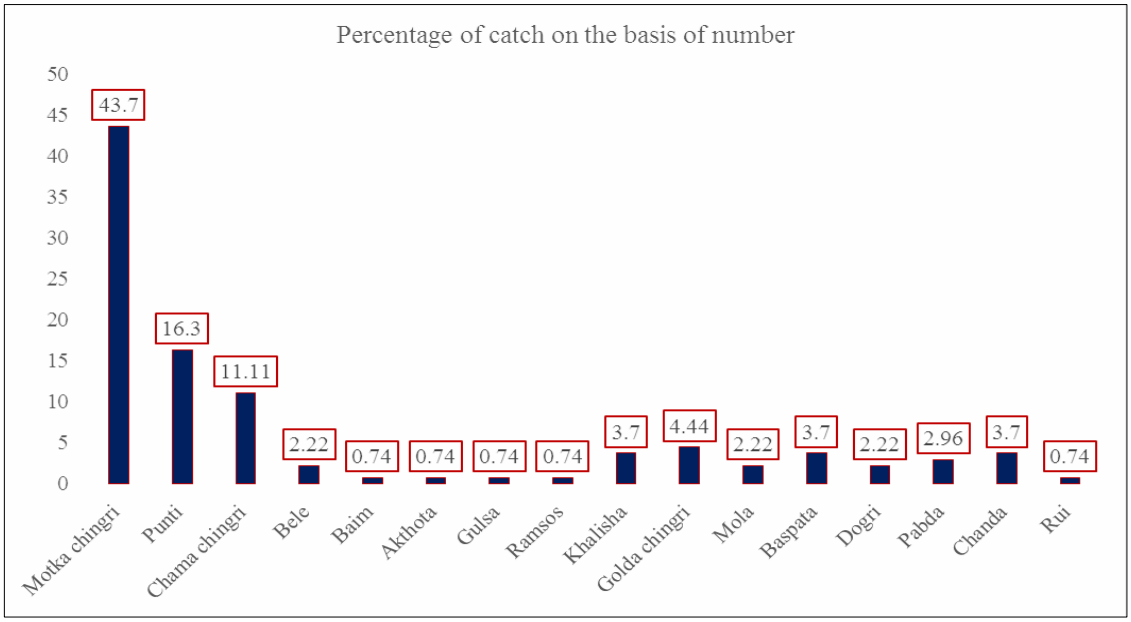


**Fig 2:** Percentage of catch on the basis of number

**b) Seasonal variation of Catch composition (on the basis of weight) in the study period**

On the basis of weight, the dominant species was Rui (*Labeo rohita*) contributed (26.4%) of the total weight. The other dominant species were baim (*Mastacembelus armatus*) contributed (20%), punti (*Puntius ticto*) contributed (12%) respectively. Variation of catch composition (by weight basis) in the study period is shown in (Table 3) and (Fig. 3).

**Table 3:** Seasonal variation of catch composition on the basis of weight

| Fish Name / Month Name | Motkachingri (wt.in gm) | Punti (wt. in gm) | Chama Chingri (wt. in gm) | Bele (wt. in gm) | Baim (wt. in gm) | Akthota (wt. in gm) | Golda (wt. in gm) | Ramsos (wt. in gm) | Khalisha (wt. in gm) | Mola (wt. in g) | Baspata (wt. in gm) | Dogri (wt. in gm) | Pabda (wt. in gm) | Chanda (wt. in gm) | Gulsa (wt. in gm) | Rui (wt. in gm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July | 6.6 | 33 | - | 7.5 | 149 | 17 | - | - | 12 | - | - | - | - | - | - | - |
| August | 4.5 | 34.5 | 4.5 | - | - | - | - | - | 5.6 | - | 0.8 | 7 | - | 1.8 | - | - |
| September | 5.4 | - | 11.5 | - | - | - | - | - | - | 3 | - | 9 | 6 | - | - | - |
| October | 3.5 | - | - | 11.5 | - | - | 59 | - | 5.4 | - | 1.4 | - | - | - | 12 | - |
| November | 3.5 | 4.5 | - | - | - | - | - | - | 6 | - | - | - | - | 0.6 | 6 | - |
| December | 6.5 | 4.70 | - | - | - | - | - | 45 | - | - | - | 4 | - | - | 6 | - |
| January | | 3.30 | - | - | - | - | - | - | - | - | - | - | - | - | - | 197 |
| February | 1.4 | 9 | 5.5 | 13.5 | - | - | - | - | - | - | - | - | 12 | - | 5 | - |
| Total | 31.4 | 89 | 21.5 | 32.5 | 149 | 17 | 59 | 45 | 29 | 3 | 2.2 | 20 | 18 | 2.4 | 29 | 197 |
| % of Fish | 4.21 | 12 | 2.9 | 4.4 | 20 | 2.3 | 7.9 | 6.0 | 3.9 | 0.4 | 0.3 | 2.7 | 2.4 | 0.3 | 3.9 | 26.4 |

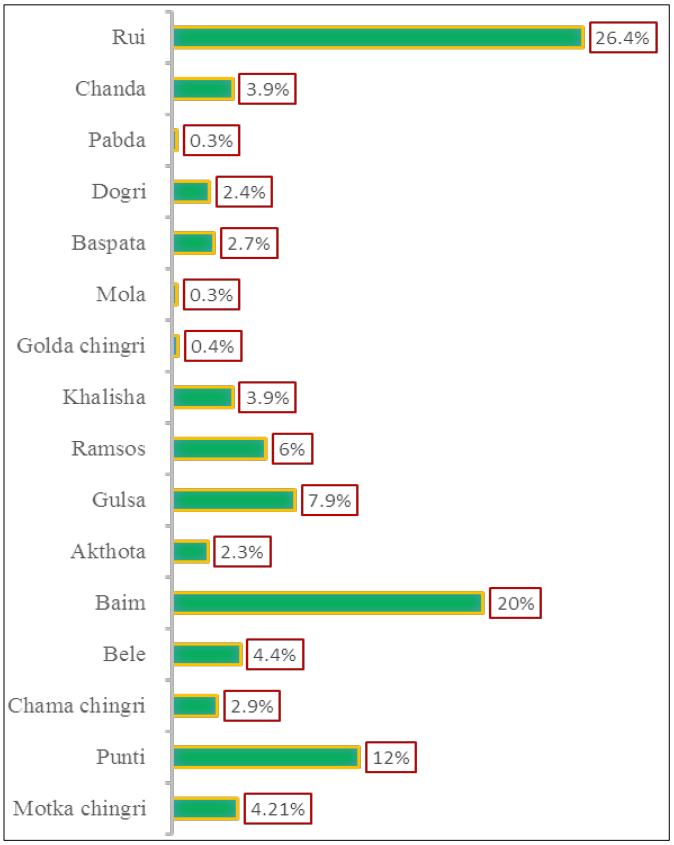


**Fig 3:** Percentage of catch by weight

## 4. Discussion

Cast net has widely used at Bishkhali River, because of its easy handling, mobile and fishing duration is short. It has also widely used at Dhaka, Mymensingh, Bakarganj, Rajshahi, Jassor, Bogra, Pabna, Rangpur, Dinajpur known as 'khaplajal', in Rangpur and Chitagong it is known as 'chlatki'. It is known as 'dhundi and kheo' in Sylhet, 'teora' in Jessor, 'pheka' in Dinajpur [1]. During the study period a total number of 16 species of fishes were noted in the catch of cast net. A total of 26 species were caught with cast net [16] and the presences of 23 species in the Baculiar River [15] which is slightly higher than the present findings, whereas 18 species were found in the Jamuna River [18] which is closely related at the findings of the present experiment. Among the 16 species, Motka chingri (43.70%) was dominant on the basis of number. The other dominant species were Punti contributed (16.30%), Chama chingri contributed (12%) respectively during the study period somewhat similar to the findings [16]. In the study period July, August, September was the peak season for Motka chingri. The percentage of number of motka chingri was caught in July, August, September was 46.15%, 34.48% and 43.47% on the basis of number respectively. The other reason was that Motka chingri is bottom dweller shellfish and cast net mainly operated in bottom. That's why motka chingri was the dominant species in cast net in the Bhishkali River during the study period. The other species of fishes were also caught but insignificant. So we can say that cast net is an appropriate fishing gear operating in the Bhishkali River.

On the weight basis, the dominant species was Rui, contributed (26.4%) of the total weight. The other dominant species were respectively Baim contributed (20%), Punti contributed (12%), Motka chingri contributed (4.21%) and so on. In the study period it is observed that above mentioned species are dominant respectively in several months. The less significant species were Pabda (2.4%), Chama chingri (2.9 %), Akthota (2.3%). Baspata (0.3%), Mola (0.4%), Chanda (0.3%) were insignificant species in the study period. Holder (2002) recorded About 17 species of fishes both in Dobabeel and Charabeel and dominant species were *C. nama* (14.29%), *P. sophore* (12.39%), *A. mola* (9.94%), *M. pancalus* (7.45%), *C. puntatus* (6.83%) [10]

## 5. Conclusions

The catch of fish has been declined in Bishkhali River, but the social dignity of fishermen has been increased due to increase income as well as prices of fish. However, fishermen faced several constraints. The fishermen have no access to bank loans due to the insufficient collateral security. They do not have access to any Government or non-government organizations offering technical and financial support. It may be summarized that fish catch in this river have declined gradually due to indiscriminate gear used, sand collection, embankment erosion, unplanned use of water resources, pollution and lack of management policy. In order to increase the abundance of fish and to recover some exclusive endangered fish species from the Bishkhali River, some action plans should be taken immediately. As for example, establish the fish sanctuary in different parts of' the river, ban of the current Jal and the fish fry should be released by the Government for better management and development practices to improve the revering fishery resources.

## 6. Acknowledgements

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