



## The fisheries resources management of the greater Rajshahi District, Bangladesh

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Fisheries and aquatic resources are economically, ecologically, culturally and aesthetically important to the nation. From the global perspectives, the main issues facing by the international fishing community generally are over fishing, overcapacity, by-catch management as well as environmental degradation. The combined effect of these factors that have made 60-70% of the major world fisheries resources are in urgent need of management action to restrict the increase in fishing capacity and to rehabilitate damaged resources (FAO, 1991). In Bangladesh, fisheries is one of the major sub-sectors of agriculture, which play a dominant role in nutrition, employment, earning foreign currency and other areas of economy. This sub-sector contributes about 80% to the national animal protein intakes, nearly 6% to the GDP and more than 12% to the export earning of the country (Task Force report, 1991). The survey reports from the Department of Fisheries (DOF, 1986) showed that 1,24,216 acres of open water area in the greater Rajshahi District including rivers, numerous beels and floodplains, is gradually declining because of flood control, drainage and irrigation project as well as Farakkan impact. The rapid population growth in Bangladesh and the faster rate of expansion of agricultural, domestic, irrigation and industrial activities for which water is essential, frequently shifting priorities from inland fisheries development to other uses.

The stagnation in fish production over the year is attributed mainly to a gradual reduction of inland capture fisheries. Data generated by the DOF shows that the total productions of capture fisheries has declined from year to year. Despite the possession of a highly productive inland water area of about 45,000 km<sup>2</sup>, the continuing decrease in fish catch increasingly threatens the livelihoods of more than 12 million fishers in Bangladesh (Hossain *et al.*, 2006). A new factor has arisen in the last 30 years, which is threatening the fish resources of the floodplain. This is the constriction of embankment and dykes in order to control flood. The great impact of these on fisheries has been described extensively by Ali (1991). The present work is an approach to gain some information on different aspects of fisheries resources in the greater Rajshahi District.

The information needed for this study was collected from multiple sources. Firstly, an extensive literature reviews were made in the area of fisheries resources. Secondly, the primary data for the study were collected through survey method from the fishermen, fish traders, Government and NGO personnel and experienced persons related to fisheries research and education (N=250). The information thus collected was

analyzed to bring it to bear on the hypothesis by simple tabulation and statistical calculations. The fish species were collected from the different fish markets, landing centres and on the fishing spots of the study area for the taxonomic study. Supporting papers, documents, information and records were collected from the Water Development Board, Rajshahi, Bangladesh. Contracts were also made with different Fisheries Co-operative Societies and other experienced personnel to obtain data on the fisheries resources of the greater Rajshahi District.

The greater Rajshahi District has vast fisheries resources, covering 2,39,292 ha, nearly one-third of the total land mass. There are 18,991 ha of rivers and canals, 19,889 ha of beels and 1,85,043 ha of floodplains. It has also 56,954 ponds covering an area of 15,369 ha. The total fish production of the area was estimated as 59864 metric tones (mt), of which open water contributed 24,562 mt (41.03%) and culture fishery produced 35,302 mt (58.97%) for the year 2000. The fish production from rivers and canals, beels, floodplains, and ponds were estimated as 2,316, 6,518, 15,728 and 35,302 mt, respectively (Table 1). The data shows that ponds contributed the highest fish production (2,297 kg/ha), followed by beels (328 kg/ha), river and canals (122 kg/ha), and floodplain (85 kg/ha). The average fish production was calculated as 110 and 2297 kg/ha for capture and culture fishery, respectively. The relative share of fish production for different water bodies were calculated as 3.87, 10.89, 26.27 and 58.97% for rivers and canals, beels, floodplains, and ponds respectively. The growth rate of fish production from 1990 to 2000 for these areas were calculated as -0.96, -1.91, -2.06 and 5.68%, respectively. From 1990 to 2000, capture fishery declined nearly 5,855 mt (1.92%) per year, whereas culture fishery increased 5.68%, and combined total fish production increased by 1.31%.

Fish production from the open water has declined due to many factors such as water quality degradation by pollution, environmental modification, fish diseases, and high fishing pressure (Ali, 1991). Environmental pollution is one of the major causes for the reduction of open water fish production. Environmental pollution caused by the pesticides in Bangladesh has been reviewed by Showler (1989). Nearly 4000-5000 mt of pesticides are used for agricultural crops every year in Bangladesh. It is estimated that nearly 25% or, 1000 mt pesticides ultimately dissolved in the water of crop lands, floodplains and drained into other water bodies (Showler, 1989). These chemical residues either directly kill the fishes or indirectly decrease

the population causing diseases, retarded aquatic growth, even shifting the breeding and feeding grounds by the fishes themselves in evidence to the pollution. At low percentage of the residues, biological activities of fish and aquatic organisms have been hampered. Most of the fish and small aquatic animals cannot survive these pesticides in concentration greater than 1 ppb (Task Force Report, 1991).

Increasing food demand is now being placed on the aquatic resources and floodplains are now among the fastest disappearing of all ecological systems (Hoggarth, 1999). Changes in pattern of land use and the widespread development of flood control schemes nation-wide have had an important impact on the extent of natural floodplain available for fish feeding and reproduction. Fishing pressure from a growing population has increased dramatically and has seriously affected the abundance of some species, particularly major carps and many even be putting the availability of more resilient floodplain fish at risk. Siltation, often a result of upstream changes in catchments, has reduced water flows and cut off vital access routes for fish from one habitat to another. Increased use of pesticides and fertilizers in agriculture and growing industrial pollution are also contributing to the deterioration of the aquatic environment.

Tsai & Ali (1997) pointed out that the flood control and drainage (FCD), and flood control drainage and irrigation (FCDI) projects became threat to the fish resources during the last 20 years. The same fate has been observed in the study area. The feasibility report on the Barnai Project

(1984) had foreseen the negative fate of fisheries sector, after the implementation of the project. Before the Barnai (FCD) Project, the fishermen obtained relatively large size of carps, Chital, Pangus, Boal, Shol, Gajar etc. and also in considerable quantity (Mortuza *et al.*, 2001). A total of 11 species of fish is now in threatening condition and some are extinct from the greater Rajshahi District. On the other hand, nine species of exotic carps and catfishes have been introduced so far in the study area under semi-intensive and extensive fish culture. Culture fish production was peaked in the 1980s as a result of increased fish and shrimp grown in ponds. However, such increase does not alleviate the problems of subsistence part-time fishermen, who have traditionally been able to provide fish for their families for free from the declining resources of floodplain fisheries.

It is therefore necessary to understand and recognize the need for aquatic habitats and the adaptation of different fish and prawn populations to certain sets of hydrological conditions for breeding, feeding, migration and movement. The negative impacts of flood control and road infrastructure on floodplain fisheries are being mitigated through a programme of floodplain stocking and fish pass construction. While planning water resources development projects, comprehensive studies on different aspects of ecological needs of fisheries species should be undertaken so that a meaningful understanding of the needs for fish and other aquatic animals emerges.

**Table 1.** Fish production from different water bodies of Greater Rajshahi District (1990-2000)

Name of the water bodies	Area (ha)	Fish Production						Growth rate (%) 1990-2000
		1990			2000			
		Total (mt)	kg/ha	Share in production (%)	Total (mt)	kg/ha	Share in production (%)	
Rivers & Canals	18991	2563	135	4.84	2316	122	3.87	-0.96
Beels	19889	8055	405	15.22	6518	328	10.89	-1.91
Floodplains	185043	19799	107	37.40	15728	85	26.27	-2.06
Subtotal	223923	30417	136	57.46	24562	110	41.03	-1.93
Ponds	15369	22518	1465	42.54	35302	2297	58.97	5.68
Total	239292	52935	221	100	59864	250	100	1.31

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