CHAPTER-I

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The fish fauna inhabiting the large and small water bodies have been of great importance and interest to mankind as a renewable source of high quality animal protein and as a source of livelihood to a vulnerable section of the society.

The earliest systematic studies on the freshwater fisheries were those of Antipa (1910) on the river Danube. But the studies on the fishery ecology of tropical rivers began much later on the river Nigar (Blanc et al., 1965). At the same time the Jonglei Investigation team (1954) explored the Nile Sudd river in southern Sudan. Since then, a number of studies have been carried out all over the world, although studies on the Asian rivers are scanty. The studies carried out on the Indian sub-continent have been summarised by Chinggran (1975). The North Eastern region, particularly Assam, is well endowed with the water resources in the form of rivers and beels with diverse fish fauna which are supporting the present inland natural fisheries. The natural riverine fisheries in this region are the capture fisheries where the nature herself sows the seed through self propagation of the species and man has only to reap without having to sow. The Brahmaputra river system consisting of a number of tributaries and abandoned river beds (beels) both on the north and south banks,
are the habitats of fish fauna of Assam. Observable differences have been found in the fish species inhabiting the river reaches. This largely appears to be a function of the river parameters such as its basin area (length, depth, etc). The slopes of the river are found to be another factor of variation in fish abundance. The meanderings in the course of the river also provide a diverse series of habitats for fishes.

The upper reach of the Brahmaputra from Pasighat to Juwahati flows over a sharp gradient maintaining strong current which renders commercial fishing by traditional gears extremely difficult. Commercial fishing is, therefore, restricted mainly to the lower reach of the Brahmaputra river where the gradient is relatively lower and habitat basins are comparatively stable.

During the last thirty years a number of studies relating to the riverine fisheries of this region have been made. Motwani (1959), Motwani et al. (1962) and Jhingran (1975) investigated into the species distribution and its potentials of the Brahmaputra river system. Singh et al. (1979, 1982) dealt with the physico-chemical characteristics of the Brahmaputra water while Choudhury et al. (1980, 1984) studied the trend and seasonal indices of the fish catch and Hilsa fisheries of the river at Juwahati. Dey (1982) made a critical analysis of the fish and fisheries of Assam. Yadava and Choudhury (1981, 1984, 1986) discussed 'Katal' and 'Banas' fishing in the beels of Assam and also the potentials and problems of beel fisheries. Dutta (1983) made a detail study on the eco-biology of Colisa species.
Indian major carps are found to be mostly concentrated in the lower reach of the river which have not yet drawn much attention of the fishery workers. Aliunhi (1957) observed poor collection of major carp eggs in Sibsagar district while Jhingran (1975) stated that the investigation carried out during May-June, 1961 in the lower reach of the river Brahmaputra at Kamrup and Goalpara districts revealed that major carp spawns are available in the lower reach of the Brahmaputra and can profitably be exploited on commercial basis. The surveys carried out during 1964-68 (Mahanta, 1982) and 1973 (Jhingran et al., 1982) reveal that good quality fish seed is available in the lower reach of the river. Choudhury and Yadava (1986) stressed on the conservational measures of the Indian major carps.

Biological data are highly variable and complex. Therefore, biologists often carry out analysis in precise quantitative terms with the help of statistical models so that complex relationship between various factors can be adequately explained. The value of a statistical model is judged by its simplicity and the closeness with which events or values predicted by the model fit the actual value. Therefore, the main objective of the present study is to ascertain the existing resources potential of the Indian major carps, its age, growth and relationship with the physico-chemical parameters like water temperature, rainfall, hydrogen-ion concentration, dissolved oxygen, bicarbonate, nitrate nitrogen, phosphate, primary production and plankton of lower reach of the Brahmaputra drainage using appropriate statistical techniques. Case study of the socio-economic
condition of four sample villages of fishermen is also undertaken to analyse the economic impact of fisheries on the fishermen.

In undertaking the study during the period 1973 to 1983 in four important landing centres of the Brahmaputra river and two riverine beels in the lower reach, it has been felt necessary to know the physiography of the river system in order to get a picture of fish habitats. Chapter II reports in detail how the river and its tributaries flow over the valley and create fish abode. It is also necessary to know the fishery potential of the water bodies of the Brahmaputra river system. Chapter III explains the catch structure of Indian major carps in some selected centres together with the estimation technique of catch statistics. Having selected a population of a particular group for study, the next step is to determine its size and rate of growth over time. The techniques for determining both size at age and growth have been dealt with in chapter IV. Fish abundance, its growth, etc., are largely dependent on its living environment. Chapter V examines the effect of environmental factors on fish catch. Fishermen, who are part and parcel of the fishery system have been given due importance and their socio-economic conditions have been reported in details in chapter VI. The significant aspects of the study have been embodied in the concluding chapter VII. Relevant literature connected with the study have been incorporated in chapter VII. 