FISHERIES OF THE WEST COAST OF INDIA

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Edited by

Dr. S. JONES

Chief Research Officer, Central Marine Fisheries Research Station
Mandapam Camp

RECENT ADVANCES IN INLAND FISHERIES RESEARCH

By B. S. Bhimachar, D.Sc., F.N.I., F.A.Sc., F.Z.S.I.

Chief Research Officer, Central Inland Fisheries Research Station, Calcutta-9

The inland fishery resources of India are vast and varied. There is an extensive river system all over the country with a vast network of irrigation canals, reservoirs and tanks. There are, in some areas, large numbers of swamps, *bheels* and ponds. There are also vast brackishwater lakes and extensive estuaries. In addition to these water resources in the plains, there are in the Himalayan region and some parts of South India a number of lakes and hill streams at high altitudes. All these waters support a variety of good species of fishes. Potentially the inland fishery resources of India are among the richest in the world, but little attention has been paid so far to develop them. There are practically no conservation measures in force on capture fisheries of the rivers, lakes and estuaries and the culture fishery operations in the impounded waters are either absent or ineffective. Large masses of fertile cultivable waters are at present lying fallow. In spite of these, fish production from the inland fisheries of India is appreciable indicating the richness of the fisheries. There is, however, an immense scope for stepping up fish production if suitable measures are undertaken to develop the fisheries. If all these fisheries are to be fully developed it is necessary to investigate many intricate problems confronting them. This would entail extensive researches on different problems.

Inland fisheries research has not received adequate attention in India. Some pioneer work has, however, been done during the pre-independence period by the Departments of Fisheries in Madras, the Punjab and Bengal. There are also reports of fisheries surveys conducted in Mysore and the then Hyderabad States. The Calcutta University and several other institutions and departments have conducted investigations on the hydrobiology of inland waters and bionomics of major food fishes. Only a brief account of the recent advances made in inland fisheries research is given in this article.

Since independence there is a greater appreciation of the need to develop the fisheries of the country to step up fish production. Several State Fisheries

Departments, some Universities and also Central Fisheries Institutions have since undertaken researches on different aspects of fisheries. Fisheries research in its modern concept, specially in relation to the dynamics of fish populations, has been initiated in this country only recently. Concerted effort has been made in the State of Orissa in regard to reclamation of a number of swampy areas for construction of fish farms. Studies have been undertaken in regard to the collection, transport and rearing of the spawn of major carps. The nutritional value of various items of food of fishes are also being studied. The West Bengal Directorate of Fisheries has carried out studies on nutritive value of raw and sedimentary sewage in relation to fish production. Experiments have been carried out on fry production and fry and spawn transport with a view to minimise the mortality rate. In Madhya Pradesh special attention is paid to the location of spawning grounds and fish collection centres both in the rivers and in the bundh type of tanks. Madras has established a freshwater biological station at Bhavanisagar, where hydrobiological studies and studies on fish bionomics are being conducted. In Kerala the Estuarine Research Station at Ernakulam is conducting studies on the bionomics of *Mugil cephalus* and *Chanos*. Fisheries investigations have been initiated in the Malampuzha Reservoir.

The University of Lucknow has been carrying out researches on a number of problems relating to biology of food fishes and ecology of inland waters. The Annamalai University has initiated extensive investigations on the Vellar estuary. Shri Venkateshwara University has undertaken hydrobiological survey of the Krishna estuary and also studies on respirative physiology of fish and prawns. In Mysore University a number of experiments relating to introduction of spawning in fishes by pituitary hormone treatment and studies on the cytochemical structure of the pituitary gland are being conducted. The University of Madras, Bombay and Andhra are, however, carrying out intensive investigations on problems of marine biology and fish bionomics.

In order to conduct scientific investigations for a proper appraisal of the inland fishery resources of India and to evolve suitable methods directed towards their proper conservation, management and development on an all-India basis, the Government of India established the Central Inland Fisheries Research Station at Calcutta in 1947. This institution has undertaken investigations on different aspects of inland fisheries. As part of the Second Five-Year Plan programme 14 research projects have been undertaken and the institution has since expanded considerably. The scientific work is broadly divided into four main divisions—Pond Culture, Riverine

river systems and assisting the State Governments in exploiting them. Studies were also undertaken to standardize an economical method of transporting carp in oxygen filled containers. The rapid industrialization in the country and consequent establishment of a number of industrial installations along the rivers has given rise to the problem of river pollution, on account of the discharge of industrial effluents, domestic sewage, etc., which seriously affect the fishery resources of these waters. The Section has been investigating the extent of damage caused to fisheries by such pollution in selected areas and recommending remedial measures. A separate Water Pollution Unit has been established which is now conducting such studies. A Unit for investigation of river problems of the riverine systems of Narmada-Tapti and Godavari-Krishna has recently been established. Surveys in connection with the construction of multi-purpose river valley projects, for the purpose of formulating suitable measures of development in the reservoirs and river basins have been a regular programme of work of the Section.

A Lacustrine Research Unit has been established near the Tungabhadra Reservoir in Mysore State for the purpose of formulating suitable measures of fisheries development in the reservoirs and river basins. This Unit is at present conducting studies on hydrobiological aspects and the fish populations of the Tungabhadra Reservoir. The project authorities have undertaken extensive stocking operations in the reservoir with suitable species of fishes.

The Estuarine Section of the Institute stationed at Calcutta is carrying out investigations on the capture and culture fisheries of the brackishwater areas. Basic studies on the biology of a number of important groups of estuarine fishes such as the Hilsa, Mullets, Threadfins and Prawns have been conducted. A programme of investigations to assess the magnitude of fish population of the Hooghly and Matlah estuaries in West Bengal and Mahanadi estuary in Orissa as also the factors affecting the fluctuations of the fisheries in them, including hydrobiological features, is now in operation. Hilsa affords a fishery of very great importance in India, Pakistan and Burma. On account of its importance and the marked fluctuations observed in its catches from year to year, Hilsa fisheries of the region has formed a feature of special interest at this Station. A ~~National~~ Hilsa Research Unit has been established in the Section to conduct detailed investigations on Hilsa fisheries in different parts of India. Considerable progress has been achieved in recent years in studies of the population structure and life-history of the fish.

There is vast scope for development of brackishwater fish culture on a commercial scale in the estuaries and coastal areas of the country. With

a view to developing scientific methods of culturing these fishes, observational and experimental studies have been undertaken in the Section. The role of soil in the productivity of brackishwater ponds and the factors governing the growth and multiplication of algæ which form the food of many cultivated fishes are being studied now. An experimental brackishwater fish farm is being established. Detailed investigations on the assessment and suitable methods of exploitation of the potentially rich fisheries of the Sundarbans areas of West Bengal are being undertaken. A 54 feet research vessel is being obtained for these investigations under the T.C.M. aid.

A separate research unit to investigate the fisheries of the brackishwater lake of Chilka (Orissa) which is believed to be getting depleted has been established under the Second Five-Year Plan. Considerable progress has been made in regard to assessment of the fisheries of the lake and also investigations on the bionomics of the major fishes and prawns of the lake.

For the first time in India an attempt has been made to collect statistics of fish catches from inland fisheries. A large number of survey centres along the Hooghly, Matlah and Mahanadi estuaries and also the Ganga River system have been established. Suitable sampling techniques have been evolved and the data on fish catches are being collected.