



CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

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R & D SERIES FOR MARINE FISHERY RESOURCES MANAGEMENT

2. THE INDIAN MACKEREL

The Indian mackerel *Rastrelliger kanagurta* exists widely distributed in the Indo-Pacific region supporting good fisheries in many countries including India.

Production

Though found all along Indian waters including Andaman & Nicobar Islands, high concentrations occur only in the southwest coast. Large-scale exploitation thus takes place in Kerala, Karnataka and Goa. The annual average catch in the country according to 1965-'84 data is 66,189 tonnes and 87% of it is fished from the west coast. In east coast maximum catches were recorded from Tamil Nadu and Pondicherry. During last 35 years for which all-India annual estimates are available, the catch fluctuated between 16,431 tonnes of 1956 and 204,575 tonnes of 1971. Two other species viz., *R. brachysoma* and *R. faughni* also occur in these waters in small numbers. Contribution of mackerel to the marine fish catches in the country, during 1965-'84 ranged from 2 to 20% with an average of 6%. In Goa and Karnataka, the mackerel contributes to high proportion in the marine fish catches. In Kerala, in spite of high production, it accounts only for 7%. On the contrary, in Andaman & Nicobar Islands, the catch is less, but in marine fish produce it forms 8%.

Till recently, the mackerel was exploited only by country crafts and gear. Today these implements are being replaced at many places by mechanised purse seiners. Karnataka alone has a large fleet of it now and the traditional *Rampen* net of the State is soon becoming out of fashion. The cotton nets, in the meanwhile, gave way to nylon materials.

The mackerel at the consumer rate of Rs. 6/- per kg fixed by Governmental Agency adds on an average of about Rs. 40 crores annually to the national income. The fish is consumed mostly in fresh or iced condition. Processing and export are negligible.

Research

In view of high commercial importance, detailed information on its biology, fishery and resource has been collected.

The mackerel is migratory in habit and its fishery is seasonal. High catches occur during September–November on the west coast and March–April in the east coast. The off-season synchronises with the peak of southwest monsoon in July–August. It breeds on shelf waters outside the conventional fishing area during pre- and post-monsoon months. The species lives in the upper layers of sea in shoals, and in calm weather they are visible at surface as patches of ripples during day time and by bioluminescence at night. This is being taken advantage of for their exploitation. Mackerel feeds on the small plants and animals called plankton present in water. No item is recognised as its staple food and none identified as indicator species.

The commercial catches depend mainly on fishes of 18–24 cm sizes and its bulk comprises of a single year class. Success of the fishery in a season rests on recruitment of this year class into the fishing grounds and annual replenishment of its stock. It was estimated that the total mortality (Z) of the mackerel in the population is around 3 of which 2 die due to fishing (F) and 1 due to natural causes (M); and the rate of exploitation (U) is thus 0.6335.

Besides annual variations in landings, the mackerel fishery shows a 10-year cycle with alternating ups and downs in its long-term fluctuations. During the unit of cycle in nineteen seventies, the average annual yield (Y) was around 87,200 tonnes. The average annual stock (Y/U) accordingly is 137,650 tonnes and the average standing stock (Y/F) available for exploitation by F 1 is 43,600 tonnes. Studies on yield per recruit (Yw/R) indicate the exploitation would be at its best when the fish is 1½ year old, 20 cm in length and 80 g in weight. Fishing has not affected the stock leading to overfishing and depletion. Yield is good between F 2 and F 4. The potential stock hence waver between 87,200 and 174,400

tonnes. As there is a sort of stagnation in yield beyond F_4 , an increase in effort will go waste without economic escalation in production. Furtherance of fishing effort hence has to be restricted. However, fixing F_{max} as 5, the maximum sustainable yield (MSY) in India would be around 218,000 tonnes.

Recommendations

Introduction of purse seining has increased the area of fishing grounds, but failed to enhance production. Fluctuations in the catches therefore are due to fishery independent environmental factors such as the coastal drifts; upwelling; monsoon and rainfall; and temperature, salinity, pH, fertility and productivity of the water. The breeding, growth, density of population, migration and recruitment to the fishery come directly under their influence. Continuous monitoring of data on the fish and its surroundings is inevitable to understand the dynamics behind it and to evolve appropriate prediction systems on production.

Developmental agencies have gone ahead with mechanisation of fishing. Purse seining has not but succeeded even in maintaining the level kept up by the traditional sector in the past. Inadvertently, conflicts between them cropped up for fishing rights. Resultant competitions in exploitation will one day affect the resource detrimentally. It becomes imperative at this juncture to avoid indiscriminate fishing and proliferation of purse seining. Regulations earmarking areas of fishing for the indigenous and mechanised fishery have already come. Closed season for purse seining during June-August as a measure of conserving spawners is a welcome gesture. But exploitation and research should go hand in hand. The fishing industry should take cognisance of the results and recommendations of research particularly on conservation of resource, and provide valuable feed back data on what, where and when they fish, how and howmuch they get, and the effort put in to fish them. Rational exploitation would then be a reality promising maximum catch without endangering this valuable resource.

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The conclusions/recommendations made in this series are subject to
revision with addition of further information on the resource.

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