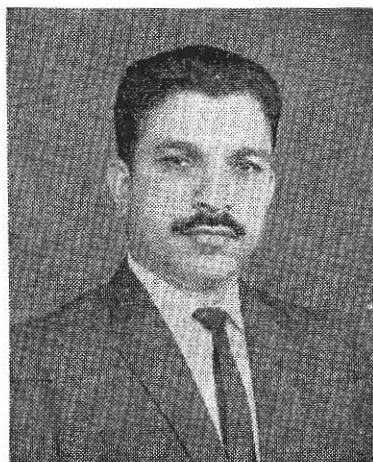


DEVELOPMENT OF PELAGIC FISHERIES

A. NOBLE

Central Marine Fisheries
Research Institute,
Cochin.



Fish, as we know, is the most important and readily exploitable of all protein source from the sea. The dominant groups of fishes contributing to the pelagic fisheries in any part of the world are Clupeioids and Scombroids. Of the total marine fish landings in India, according to the recent trends, almost 50% are composed of these fishes known under the popular names sardines, anchovies, white-baits, mackerel, tunnies, etc. Among these, the oil sardine (*Sardinella longiceps*) and the Indian mackerel (*Rastrelliger kanagurta*) are the most important commercially abundant species in our waters. The tunnies form important fisheries in our offshore waters and there is increasing trend in their landings.

In the immediate past, the oil sardine formed about one-third of the total marine fish catches. But we cannot forget the harrowing tale of the fifties of this century when their landings were deplorably thin. Similarly, catches of the Indian mackerel also show wide fluctuations between 2 and 20% from year to year.

During the past 2 decades, we have made long strides in developing demersal fisheries especially for shrimps. There is substantial increase in our foreign trade for crustacean products. In spite of the importance of pelagic fishes in the Indian fisheries, nothing has so far been done towards modernisation and mechanisation in the harvesting of these resources. The related industry is still in the same old unpredictable unsettled state of waiting and hoping for good. We have no idea as to how the fishery would be in the days to come. It is high time to salvage it from this hopeless plight and put it on firm grounds of a stable industry confident of its prospects.

The fishermen still use the age-old dugout canoes, their efficient but cumbersome shore-seine particularly the *Rampan* of the Kanara and Konkan coasts, and the conventional boat-seine, the *Kolli vala* of the Malabar Coast.

Besides being highly variable in the catches, the fishery is strictly seasonal too. These fishes are still hunted only along the narrow coastal belt when they

haunt this area. Ignorance still rules us when we try to comprehend the mystery governing the seasonal occurrence and their magnitude in the catches. The mackerel and the oil sardine seem to come from the offshore waters during the period of commercial fishery and go back afterwards. It is believed that they come to the inshore areas to feed and grow and go back to breed and propagate.

But we do not know from where exactly the mackerel and the oil sardine appear along the coastline in such abundant numbers to contribute to the commercial fishery in certain part of the year and where they go after the coastal sojourn for a while. We do not know for certain why they flock in such teeming millions along the coast and why they desert this rich pastures afterwards if they come here for feeding. We have only preliminary information, framed mostly on circumstantial evidences, when and where they breed, feed and grow, before they enter the inshore waters. Our knowledge of the life-histories are also limited. What we have done to understand these is very little compared to the magnitude of the problem. Considering the facilities in our hands, we can certainly be proud of what we have found out about their life, growth, feeding, breeding and migration.

The important aspect of study in the development of these pelagic fisheries is thus centered around probing deep into the different facets of their population dynamics commencing from birth till death. Tagging work conducted by the Central Marine Fisheries Research Institute all along the coast has revealed certain interesting results. Something can now be said with certainty about

their migration along the coast during the period of commercial fishery. The assumptions and theories about the growth founded through studies on the length frequency, i.e. progressive shifting of the modal lengths from month to month, in the samples taken from the commercial landings are supplemented to an extent by observing the increase in length of the fish tagged and released and later recovered. But these recoveries are again from the commercial catches of the local fishing units which operate along the narrow coastal belt of 8 to 12 km. only. The movements of the tagged fish offshore are still unknown for want of commercial exploitation there or any attempt to track them down through exploratory fishing. Tagging without such complementary effort will be less useful. Tagging as is done now is useful only as a means in elucidating ideas about the growth of the fish from the already grown appearing along the coast and their migratory movements there. It may help us to find out how long the fish might live after tagging. The tagging programme done in large scale, on the level of shoals and not individuals, with facilities to eliminate and also to determine the tagging mortality may even provide ample clues to assess the stock exploited as well as untapped. Its use as a tool to spot out the spawning ground is a far fetched one for lack of attempts to explore them offshore. It entails following their trail farther in the ocean, in the absence of which the present obscurity may continue. Tagging will give an answer to the still unsettled problem of fixing the age of the fish affirmatively, especially when they initially appear along the coast to contribute to the commercial fishery, unless and until one is taken to the spawning

ground and from where it gets back ashore with the shoals during their shoreward migration.

How best can this be done is the question before us. We are indebted to the good-will of the people of Norway and their Government for their valuable contribution to the development of trawl fishing in the country. The Indo-Norwegian Project is making persistent efforts in the furtherance of our fishery through many means. Their attempt to exploit the pelagic fishes by using purse-seine is praise worthy.

Exploitation of the pelagic resource is not a very easy problem. The behaviour of the fish, which in the oil sardine is entirely different from that of the mackerel, has to be taken into serious consideration before any attempt for developing their fisheries are made. The method used for fishing the sardine may be a failure for the mackerel. Conventional sardine fishing requires a noisy scene to scare them towards the net. They move horizontally in the affray and get trapped in. But it has been observed, while on board research as well as fishing vessels on many occasions, that the slightest disturbance in the environment, the sound of the approaching mechanised crafts, is more than enough for a patch of mackerel shoal at surface some 50 meters away to disappear to the bottom all on a sudden. Having gone vertically down, in shallow waters, they seem to disperse in all directions. The wall of net on the way, in the case of a shoal already encircled in purse-seine operation, drives them circling as fast as possible; and the fish escape through

under the boat while desperate attempts are still on to make the net a complete purse. Instances where the net, operated after sighting huge shoals of millions of mackerel, had, to be hauled up with only a paltry catch, are many. Fishing of tuna by purse-seine is also no different from the one found in mackerel in our waters.

If sardine can be caught amidst confusion the mackerel can also be lured into the snare cunningly with most silent, cautious and undisturbing techniques. Increasing the size of the net may not bring in any solution. It will in turn envisage the burden of larger boats and bigger crew which together will turn out uneconomical. Moving to more offshore areas then seems inevitable too. More over, the purse-seine is no better than the Rampan net the operation of which proves profitable only if sufficiently huge shoals of the fish are sighted. Experience drives in the truth that mackerel or sardine shoals are very rarely seen at surface outside the traditional fishing grounds confined to the narrow coastal belt. Application of the purse-seine offshore is thus ineffective. If that is so, what other rail is there for us to ride on to the still unknown dark corners of the pelagic fisheries? Is the shoaling behaviour just a seasonal instinct developed all on a sudden? Do they disperse breaking off the concourse as they move offshore? Do they lead a deep-sea life during this time? It not, why the mackerel shoals are not found at surface in the offshore waters as often as they are seen in the inshore waters in the season?

It is difficult to answer these questions at present. Scanning the waters, column by column and farther ^{and farther} till the mysterious maternity home and

the nursery of these fish are specifically located, is necessary. It calls for a scheme of stratified experimental fishing exploring the vast ocean at different depths. Gill nets have to be set in the sea at various depths from the abyss to the surface and at various distances from the littoral to the oceanic waters. Concomittantly extensive tagging also must be done and the movement of these fish might well be looked for in the catches of these nets. Besides, it requires research vessels, rather floating laboratories, capable of moving fast and equipped with all modern electronic devices for under water exploration. It requires enterprising young men trained in surveying the sea in all its sinister surroundings. They may be ready to incur the risk of high seas for days,

weeks or months together. It must then be augmented with sister vessels, supply ships and aviation equipments for reconnaissance and quick emergency transport. Over and above, it requires huge finances to meet the expenditure. It demands sustained joint effort on the part of the industry and the scientist. Such an endeavour made from all corners may surely make the development of the pelagic fishery no more a problem. A project for pelagic fishery investigation on the south west coast of India, planned as a resource survey of the stock of sardine and mackerel is in the offing and let us hope that it may help to make the development of the pelagic fisheries easier.

●