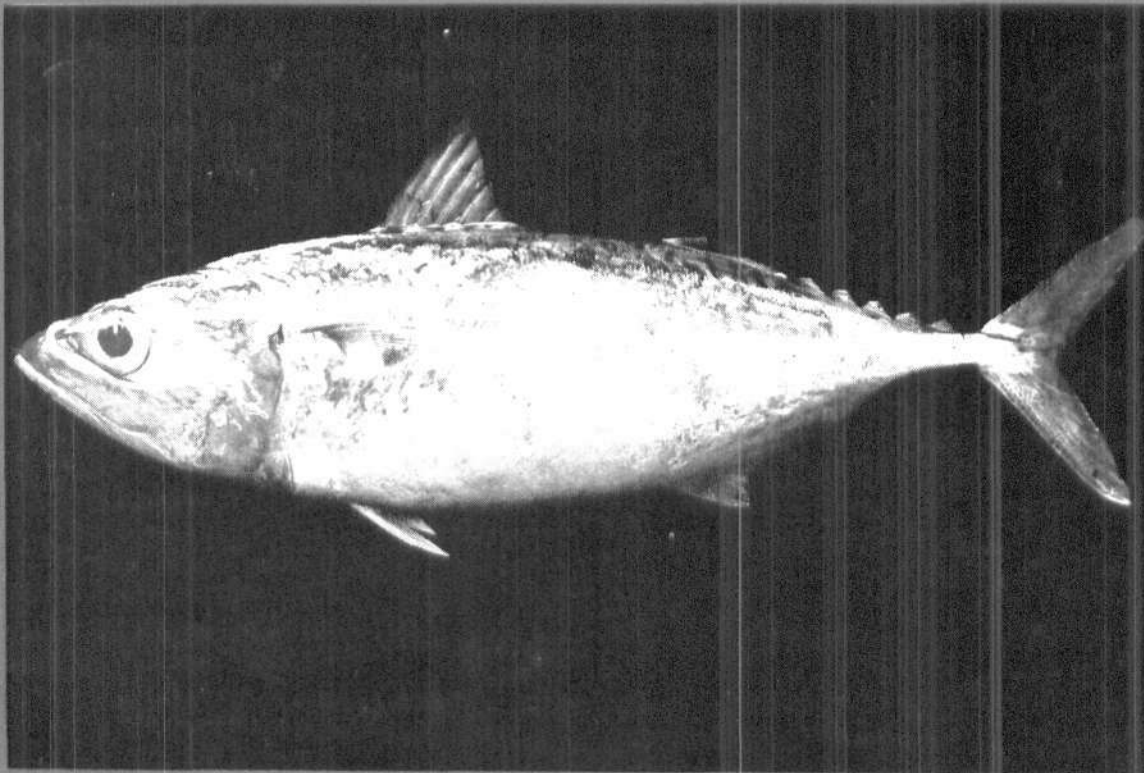




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THE MARINE FISHERIES INFORMATION SERVICE: Technical and Extension Series envisages the rapid dissemination of information on marine and brackish water fishery resources and allied data available with the National Marine Living Resources Data Centre (NMLRDC) and the Research Divisions of the Institute, results of proven researches for transfer of technology to the fish farmers and industry and of other relevant information needed for Research and Development efforts in the marine fisheries sector.

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THE MACKEREL FISHERY—A SHORT REVIEW

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Trends in production

Estimated landings of mackerel in India is available from 1950 to 1982 in published accounts (CMFRI, 1969, 1980, 1982, and 1983). The data for 1983 is taken from the reports and records of Fishery Resources Assessment Division of the Central Marine Fisheries Research Institute. Ranging between 16,431 tonnes of 1956 and 2,04,575 tonnes of 1971 (Fig.1), the landings fluctuated widely from year to year.

Though the fish is available all along the Indian coasts, it forms a commercial fishery in the west from Quilon in Kerala to Ratnagiri in Maharashtra only. In 1965-'83 (full complements of statewise landings including that of the Union Territory of Goa being available from 1965 onwards only), the catches in Kerala ranged between 3,600 tonnes of 1968 and 95,164 tonnes

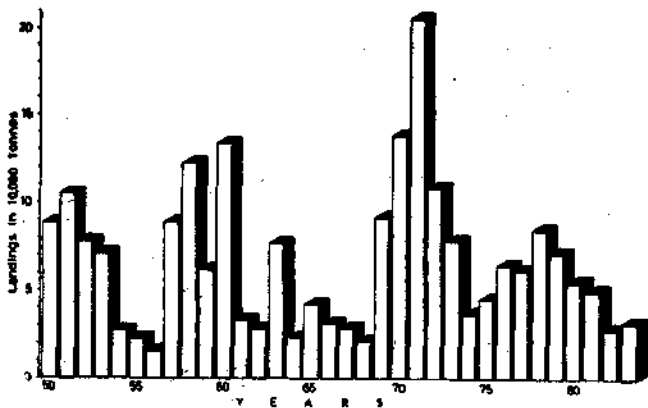


Fig. 1. Annual mackerel landings in India.

of 1971 (Fig. 2). The catches, nevertheless were mostly between 10,000 and 20,000 tonnes. In Karnataka, in 19 years, the catches fluctuated from 2,182 tonnes of 1983 to 64,047 tonnes in 1971. The landings here were erratic during 1965 to 1969. Subsequently it increased to almost above 20,000 tonnes per year, except 1974 and 1975, and 1982 and 1983 (Fig. 2).

Goa is the next important place of mackerel production in the country. The catches here varied between 220 tonnes of 1983 and 35,258 tonnes of 1971 (Fig. 2). In fact, the catch here was never as low as it occurred in 1983. Prior to it, the lowest was 2,446 tonnes of 1980; and production from 3,500 to 8,000 tonnes per annum was most common. In Maharashtra (Fig. 2), the catches oscillated widely between four tonnes of 1967 and 20,683 tonnes of 1969. The catches here, however, were mostly below 25,00 tonnes only. The annual mackerel landings swung between 0 and 112 tonnes in Gujarat, 13 and 2,015 tonnes in Orissa, 1,040 and 6,525 tonnes in Andhra Pradesh, 521 and 12,086 tonnes in Tamil Nadu-Pondicherry, and 12 and 348 tonnes in Andaman & Nicobar Islands (Fig. 2). However, the catches were generally confined to 2,000 to 5,000 tonnes in Tamil Nadu-Pondicherry and it varied between 1,000 and 3,000 tonnes in Andhra Pradesh. In Orissa, the catch touched four digits in 1983 after 12 years of such an occurrence in 1970.

The all-India average annual landing of the mackerel in 34 years of 1950-'83 period was 66,584 tonnes. The catches during 1950-'53, 1957-'60 (except 1959), 1963, 1969-'73 and 1978-'79 (Fig. 3) were higher than this and lower for the rest. The average all-India annual value computed for 19-year period of 1965-'83 when statewise landings in full are available, is 67,419 tonnes. Average annual production of mackerel during 1965-'83 period was 8,542 tonnes along the east coast and 58,877 tonnes on the west coast. The 19-year averages in the states were; Karnataka 23,478 tonnes, Kerala 23,094 tonnes, Goa 9,001 tonnes, Tamil Nadu-Pondicherry 5,321 tonnes, Maharashtra 3,293 tonnes, Andhra Pradesh 2,688 tonnes, Orissa 436 tonnes, Andaman & Nicobar Islands 97 tonnes, and Gujarat just 11 tonnes.

For the first time in the history of mackerel fishery, seven tonnes of it is reported to have occurred in the fish landings of Bengal in 1983. The mackerel landings in east coast in the year exceeded the landings of west

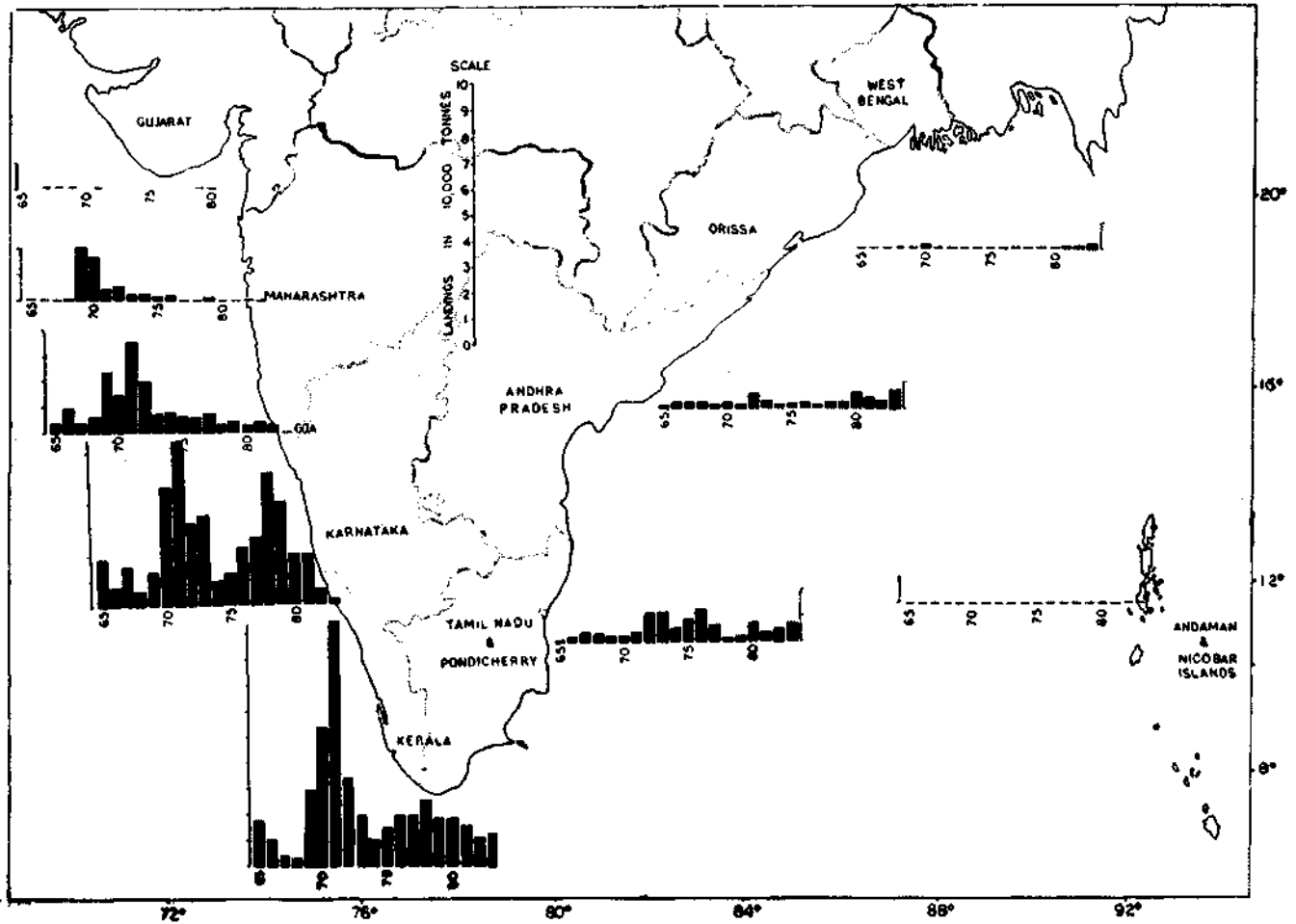


Fig. 2. Statewise mackerel landings during 1965-'83.

coast, also for the first time, with 15,680 and 15,503 tonnes (Fig. 4) forming 50.3 and 49.7% respectively. The percentage contribution from east coast in the previous year also was as high as 31.8. The mackerel production in east coast in 19 years (Fig. 4) shows the

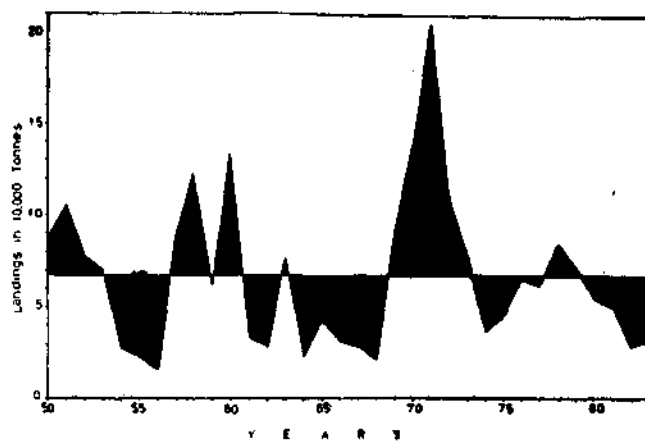


Fig. 3. Fluctuation of all-India annual mackerel production from average landing during 1950-'83.

catches to vary between 2,233 tonnes of 1965 and 16,700 tonnes of 1972. In 1972 when the landing was the highest here in quantity, it formed only 15.3% in the all-India catch. Along the west coast, the catches varied between 15,503 tonnes of 1983 and 1,99,120 tonnes of 1971. The contribution from west coast, however, was 97.3% in 1971 forming the highest percentage in record. Another year of low production in west coast was 1968 with 16,123 tonnes. But it formed 74.3% in country's catch of the year.

During 1965-'83, Karnataka tops with 34.82% (Fig. 5) of the total mackerel production in the country. Kerala closely elbows it with 34.25%. The contribution of Goa in all-India production is 13.35%. States next in order of importance are Tamil Nadu-Pondicherry, Maharashtra, Andhra, Orissa, Andaman & Nicobar Islands and Gujarat; contributing to 7.89%, 4.89%, 3.99%, 0.65%, 0.14% and 0.02% of the total catches respectively.

Contribution of mackerel in marine fish production in the country from year to year is given in Fig. 6, and

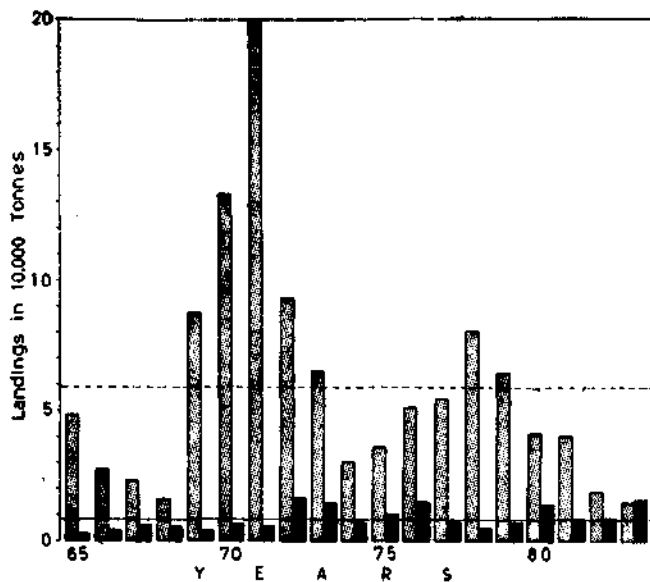


Fig. 4. Annual landings of mackerel in east coast (black bars) and west coast (stippled). The continuous line shows 19-year average in east coast and broken line depicts it in the west coast.

the production of mackerel is not in proportionate pace with the increase in marine fish production. The average annual production of marine fish during 1950-'83 was 958,178 tonnes and mackerel in it formed 66,584 tonnes.

The mackerel contributed to a percentage as high as 19.65 in the total marine fish production in the country in 1951. However, in 1971 when the mackerel catch was the highest, it formed only 17.61% in the year's marine fish landings. During the 10-year period commencing with 1973, the percentage of mackerel in the marine fish catches was low (Fig. 7). Earlier for 8 years starting from 1961 (except 1963) and 3 years beginning with 1954, the percentage of mackerel in the marine fish catches was low. The lowest ever recorded percentage of 1.97 occurred in 1982. The percentage, in fact was 2.29 in 1956 when the catch was the lowest.

The percentage of mackerel in the marine fish catches during 1950-'83 as a whole was 6.95. But on account of persistent low values in recent past, as detailed above, the average percentage in 1965-'83 reduced to 5.69 (Fig. 8).

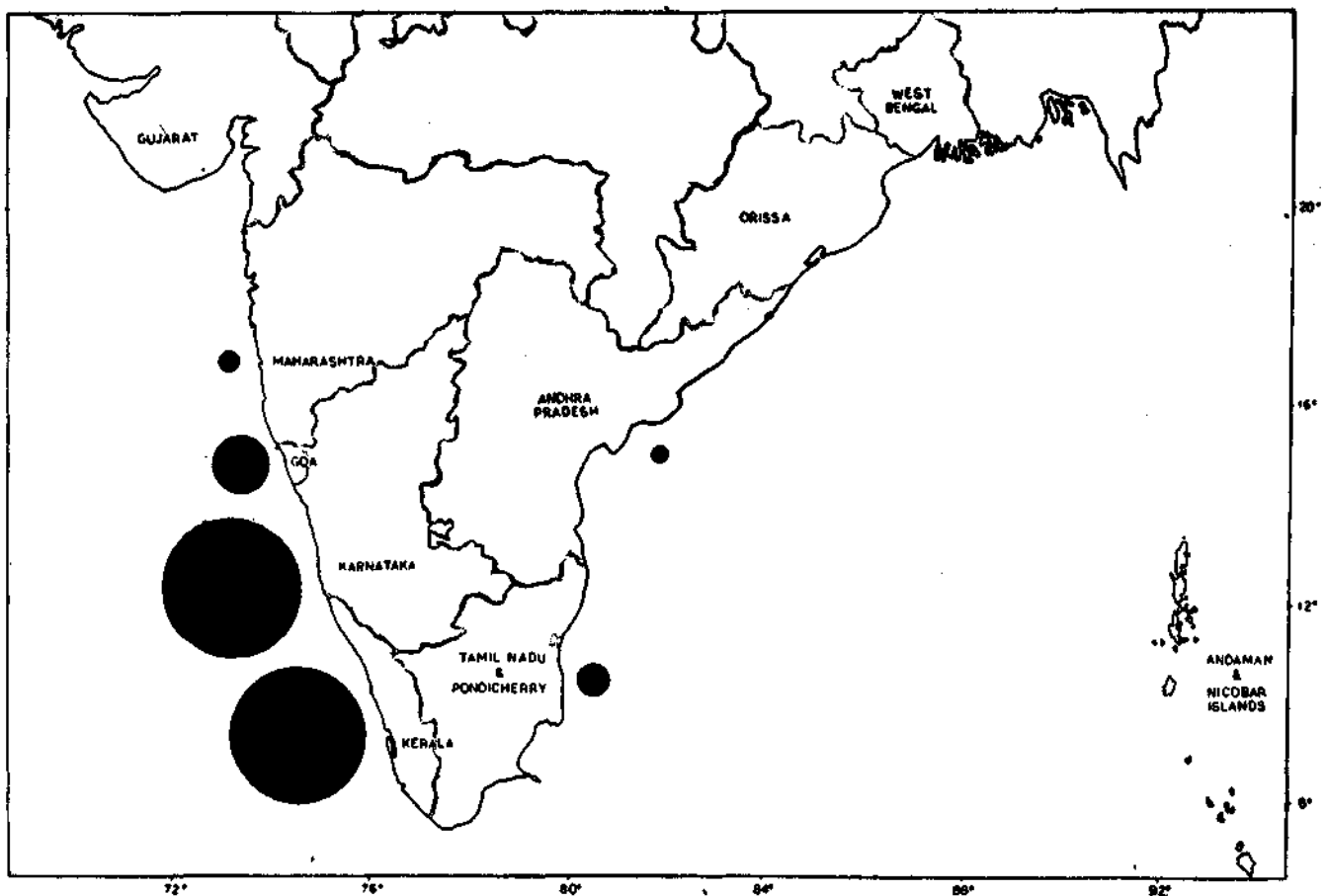


Fig. 5. Percentage of mackerel production by states in the all-India total catch.

The importance of mackerel in the economy of Goa is high as it forms 34.38% in the marine fish catches there during 1965-'83 (Fig. 8). The contribution of mackerel to the total marine fish catches in Karnataka is 23.21%. Mackerel is the only fish that can be claimed as proprietary item of these states in the country.

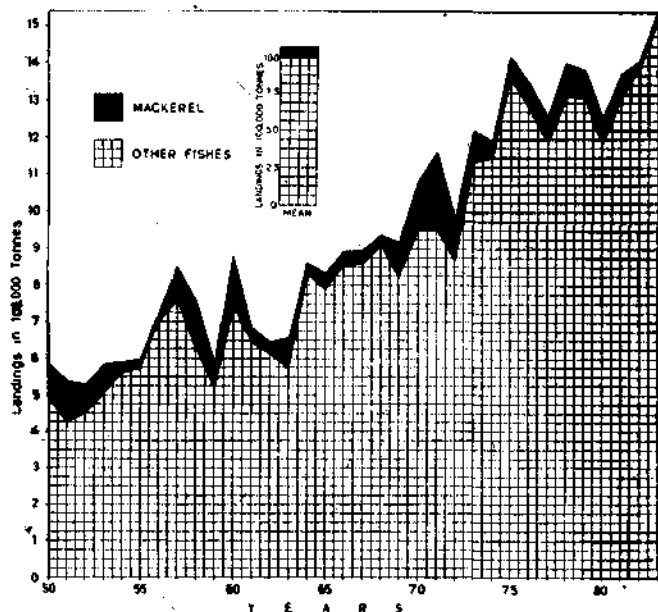


Fig. 6. Mackerel in annual all-India marine fish catches.

In spite of high catches, mackerel in Kerala forms only 6.49% in its marine fish landings (Fig. 8). Huge catches of oil sardine here cause such a situation. In Andaman and Nicobar Islands, the catch of mackerel, though very little in quantity, is worth mentioning as it forms 7.68% (Fig. 8) in the marine fish catch. In other maritime states of the mainland the percentage of mackerel in their marine fish landings is 2.68, 2.62, 1.51, 1.13, and 0.01 respectively in Tamil Nadu-Pondicherry, Andhra Pradesh, Maharashtra, Orissa, and Gujarat.

The mackerel season in the country falls during September–April period (Noble, 1982 a). As the bulk of the landings occurs along the west coast the seasonal distribution on all-India level is only a reflection of what is happening in the west. The fishery, here commences first in the south and late in the north (Noble, 1979). It often peaks in Kerala in September itself. In Karnataka and Goa, though the season commences in September, intense landings occur in October. In Maharashtra, on the other hand, the season commences in October but peaks in November. The peak landing also thus occurs earlier in the south than in the north (Noble, 1979). In the east coast of the mainland, nevertheless the maximum occurs in March–April. But in Andaman

& Nicobar Islands, the season is a protracted one the mackerel occurring almost equally in all the months of the year (Noble, 1982 a).

Rastrelliger kanagurta is the species that commercially contribute to the fishery in the country. *R. brachysoma* and *R. faughni* also occur in our waters. The mackerel landed in 1981 and 1982, for instance in Tamil Nadu-Pondicherry consisted of respectively 0.57% and 0.14% species other than *R. kanagurta* (CMFRI, 1982 and 1983).

Mackerels were once caught only in boat seines, shore seines and gill nets operated from indigenous fishing crafts. Of late, mechanised units like purse seines, drift nets and trawls also exploit this resource especially along the west coast. In fact, the purse seine has virtually replaced the indigenous gear in Karnataka and Goa where 78.7% and 90.6% respectively (Fig. 9) of the catch in 1981 were landed by mechanised units (CMFRI, 1982). In Kerala, 75.0% of the catches in the year was still made by indigenous fishing units only. Exploitation of mackerel by mechanised units increased here also in the subsequent year (CMFRI, 1983).

Research high-lights

Advent of mechanised fishing and resultant expansion of fishing grounds, however, have not concurrently improved the landings in the country as a whole and Karnataka in particular. In 1956, when the mackerel catch was the lowest the catch in Karnataka with *Rampani* as principal gear in vogue was 3,177 tonnes (CMFRI, 1969). But with about 400 purse seiners working along Karnataka coast at present, the mackerel catch crumbled to just a low value of 2,182 tonnes in 1983. The highest catch since 1950 in Karnataka was 81,882 tonnes of 1960. In 1957 and 1958 also, when

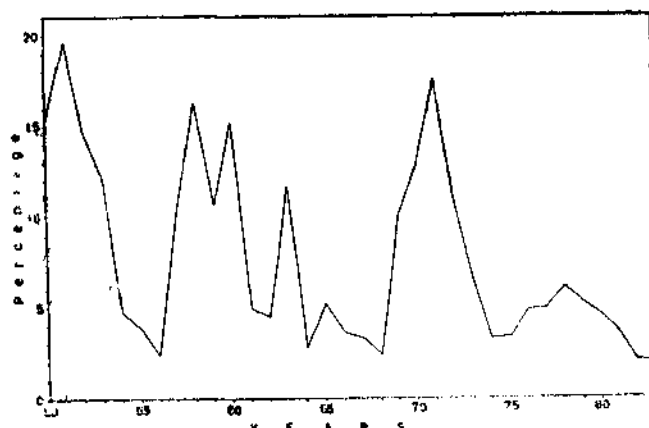


Fig. 7. Percentage of mackerel in annual marine fish production.

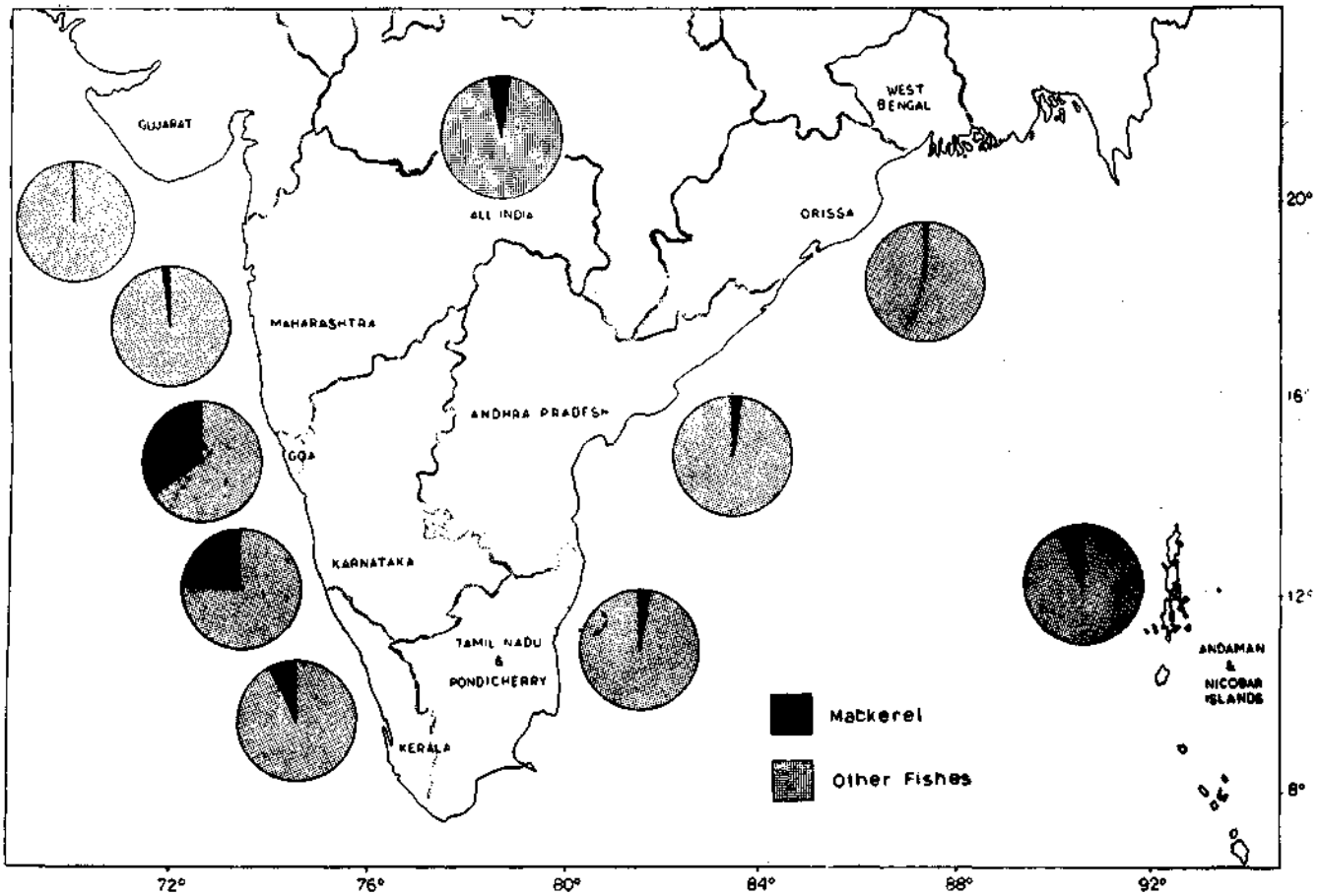


Fig. 8. Percentage of mackerel in marine fish landings of different states, and country as a whole during 1965-'83.

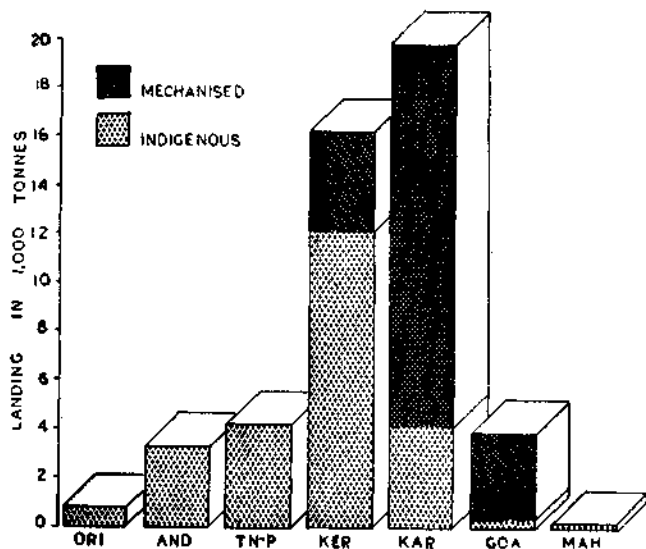


Fig. 9. Statewise landing of mackerel by mechanised and non-mechanised gear in 1981.

Rampani was the gear in command, the catches were as high as 55,754 and 63,365 tonnes respectively (CMFRI, 1969). Since introduction of purse seine in late nineteen

seventies, the highest annual catch was only 50,704 tonnes of 1979. The story in Kerala and Goa is also in no way different. The fishery in its 10-year cycle of long term fluctuations (Noble, 1980) presently is on a low ebb, and to crown it, mature fish and spawners seem to be disturbed by the mechanised fishing fleet (Noble, 1982 b).

As already stated, the mackerel fishery in its long term fluctuations shows a 10-year cycle with ups and downs (Noble, 1980), and the current trend, notwithstanding is not encouraging. Whether it is caused by human interference and intrusion into their nurseries or due to fishery independent environmental factors is a matter of much concern. Suspension of fishing by purse seine during June-August, coinciding the supposed spawning period of the fish, however, is a great relief.

The annual stock of mackerel as estimated by Sekharan (1974) is 1,30,000 tonnes. The average production in nineteen seventies being 92,000 tonnes indicated an exploitation around 70% of the stock. The total mortality declaring the death of 94% of stock, in

these years was 2.877 (Noble, MS). The fishing mortality (total mortality less natural mortality of 0.9 by Sekharan 1974) is 1.977 and the rate of exploitation becomes 68.7%. Banerji (1973) also computes a rate of 68.3% exploitation for earlier years.

Investigations on the age composition of the commercial catches through length frequency studies reveal the fishery to sustain mainly on a single year class recruited afresh every year. The commercial fishery depends chiefly on fish of sizes 16 to 23 cm in total length. For want of non-selective specific gear a reliable index of its abundance in the sea is, however, lacking; rendering estimates on mortality, stock assessment and exploitation rates a little difficult.

Prospects

Monitoring resource characteristics on the mackerel at present is being carried out when they are already recruited and commercially being exploited. By and large, it imparts some data on the resource and availability of spawners. It is imperative at this juncture to conduct fecundity studies, spawning surveys, eggs and larval studies, young fish surveys, and recruitment studies; involving sophisticated acoustic and aerial devices and remote sensing through satellites. The erstwhile Pelagic Fishery Project at Cochin had done some work on this line for a few years (PFP, 1974) along the southwest coast bringing out quantitative appraisal of the resource ready for recruitment shortly after. Besides, such a study imparts also advance information on the movement of stock and their direction indicating when

and where they hit the coast. Fixing up a national target of production is then a feasible proposition, accordingly aiding regulation of annual exploitation avoiding over-fishing and depletion of stock.

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