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METHODOLOGY AND BRIEF REVIEW OF THE OCEANOLOGICAL FEATURES OF THE INDIAN WATRES

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The centres selected for detailed biological studies were Minicoy in the U.T. of Lakshadweep, Mangalore, Calicut, Cochin and Vizhinjam along the west coast and Tuticorin along the east coast of the mainland. In all these centres, uniform pattern of data collection system was followed as detailed below :

Each centre was visited at least 4 days in a week and the weekly landings were estimated by

$$W = \frac{Ci}{Cj} \times UK$$

where

W = Weekly total catch
Ci = Catch for observed unit in a week
Cj = No. of units observed (effort)
UK = Total units operated during the week.

From the weekly estimates, monthly catches were computed. In the centres where more than one unit was operated, the standard effort between the units was calculated as follows :

$$SE = \frac{C_i}{C_{ii}} \times T_i + T_{ii}$$

where SE = Standard effort.

C_i = Catch per unit of effort in weight of one standard gear.

(In Minicoy the Pole and line gear and in the mainland the drift gill net)

C_{ii} = Catch per unit of effort of other gears.

T_i & T_{ii} = Total number of units expended their effort during the month in the tuna and allied pelagic fish fishery.

In the case of purse seine catches, random sampling of the units landed were carried out. Each purse seine usually employs carrier boats which bring the catches to the landing site. The catch of carrier boats as well as that of the purse seine boats were noted by random sampling. The average catch of the observed units is then raised to the total number of purse seiners operating on the day and the average catch for the observation days are then raised to the number of fishing days operating in a month. For estimating the catch per unit effort, the total purse seines operated in a month was taken into account.

2. *Brief review of the oceanological features of the Indian Coast*

BOBP (1983) briefly summarised the fishery resources and the prevailing hydrological characters of the coast of India.

The climate of India can be described as a tropical monsoon climate. Investigations conducted in the past has shown that several layers of water masses such as the Indian Ocean central water, the Indian Ocean equatorial water and the Deep water at a depth of 2000 m are recognisable in the region of subtropical convergence at about 40°S. in the Indian Ocean below the surface waters. The transportation of the cold Antarctic bottom water from the polar regions into the Arabian sea and the Bay of Bengal influence the organic productivity of these areas.

It has been estimated that the rate of primary production on the east coast as 0.63 gC/m²/day on the shelf and 0.19 gC/m²/day outside the shelf. Along the west coast of India the mean value within 50 m was calculated as 1.24 gC/m²/day and the daily production rate of the rest of the west coast shelf as 0.47 gC/m²/day and for the oligotrophic regions outside the shelf as 0.19 gC/m²/day.

The sea surface temperature of the Indian Coast varies from 23°C to 29°C. Along the north western

region, a temperature value of 21°C was recorded during winter season (Nov.-Dec.). In the Bay of Bengal, the range of sea surface temperature is 27°C and 29°C. The thermocline fluctuates much on the west coast of India, being recorded at 100-125 m in winter, at 75-90 m between the monsoon and 20-30 m with the progress of the south-west monsoon. In the Bay of Bengal, the thermocline level is usually below 50-55 m and at times goes down to 100-125 m. Off the west coast, large-scale upwelling has been recorded during the south west monsoon and during the north east monsoon, fairly strong convergence was observed on the east coast of India and in the Andaman Sea.

In the Arabian Sea, the average salinity range is between 34‰ and 37‰ and in the Bay of Bengal 30‰ and 34‰. The influx of Red Sea and Persian Gulf water is the causative factor for the high salinity in the Arabian Sea whereas the large river systems emptying into the Bay of Bengal influence the low saline condition there. It was also observed that the waters in the Arabian Sea is somewhat deficient in oxygen at a depth of 200-500 m depth and this layer is subject to movement as a result of upwelling.