

- ¹ H. T. Freebairn, *Plant physiology*, 36(Suppl.): 20, 1961.
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ZOOLOGY

Survey of the Demersal Fisheries of the Saurashtra Waters

Sea fishing in India has been restricted to the coastal pelagic fisheries for long, the rich demersal fisheries being practically unexploited^{1,2}. Exploratory demersal fishing was therefore undertaken all over the Indian coast for nearly half a century^{3,4}. Many accounts are available on these experiments in the Bombay and Saurashtra waters^{5,6,7,8}. Seshappa⁹ and Jayaraman *et al.*¹⁰ gave detailed accounts of bull-trawling and otter-trawling by larger vessels, but the present note is the first account of otter-trawling by smaller vessels in the Saurashtra waters.

Systematic survey of the Saurashtra fishing banks for bottom fish were made during November 1958 to April 1963 with two Govt. of India trawlers (M. L. Meera and M. L. Sagarpravasi, 33 ft. 12 tons) based at Veraval

processed monthwise. The areas explored during the survey (see chart) extend over 2300 sq. miles along the Saurashtra coast from Diu to Porbandar in the depth range 20 to 61 metres (10 to 34 fathoms). The data collected during the survey were processed in different ways to show the distribution of fishing effort, catch and catch per unit of effort (CPUE) through time, space and depth. A latitude-longitude square, designated accordingly, was taken as a major area divided into 36 subareas, each of area 100 sq. miles, and 3 metres' depth as a depth range. The main purpose of the survey was to show (i) the kinds of fishes available and their seasonal variation in various areas; (ii) the areas and depth ranges where there is maximum concentration of 'all fish' (as shown by maximum CPUE value); (iii) the areas and depth ranges known as best for different categories of fishes; and (iv) the gear best suited for trawling in these waters.

It is not possible to present here the voluminous data on hand, but two tables and a short account are given to show the results of the survey. Table I shows the area and depth ranges explored. Table II gives a month-wise summary of the operations.

TABLE I

Areas and depth ranges explored

Areas	Sub-areas	Depth range (metres)
21-69	5B,4B,4C,3C,3D,2E,1F	29-49
20-69	6F	38-43
21-70	1A	23-28
20-70	6A,6B,6C,5A,5B,5C,5D,4B,4C,4E,4F	20-61
20-71	4A,4B,4C	23-34

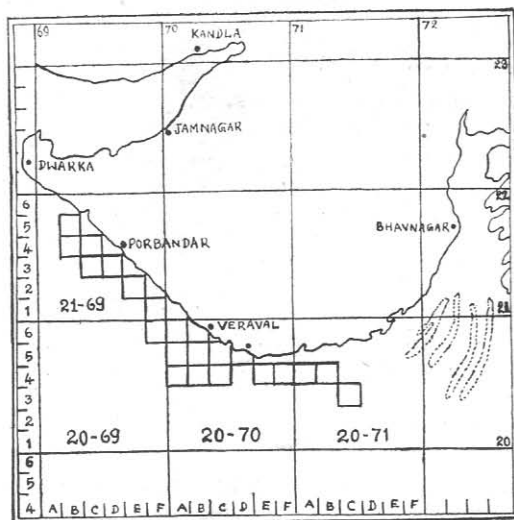


Chart showing areas explored for bottom fish.

and operating different types of trawls at a speed of 2 knots. Detailed log sheets were prepared for each haul and the data were

The following is a brief account of the demersal fisheries characteristics of the Saurashtra fishing banks. With all the limitations of the method of survey and the data available, it can be said that the Saurashtra fishing banks are very rich in trawl fisheries including many esteemed categories, that can support a steady fishing industry. Their productivity compares much favourably with some of the well-known fishing grounds¹¹. The maximum catch of 'all fish' (kg.) per hour in various areas were mostly above 200.

TABLE II

Summary of operations

Month	Areas	Depths (m)	Fishing effort (Hrs.)	Total catch (kg.)	Catch per hour
I. M. L. Meera					
Nov. 1958	20-71, 21-71	21-39	24	526	22
Dec. 58	20-71, 21-69	18-41	87	2,796	32
Jan. 1959	20-71	20-41	84	11,274	134
Feb.-Sept. Repairs					
Oct. 1959	20-71	20-41	56	5,679	101
Nov. 59	20-71	18-39	109	13,584	125
Dec. 59	20-70	24-39	120	16,565	138
Jan. 1960	20-70	20-41	91	9,689	106
Feb. 60	20-70	18-39	110	7,831	71
Mar.-Oct. Repairs					
Nov. 1960	20-70, 21-69	21-38	68	4,057	60
Dec. 60	20-70, 21-69	23-43	83	7,256	87
Jan. 1961	20-70	31-42	56	4,354	78
Feb. 61	20-70	33-37	7	673	96
II. M. L. Sagarpravasi					
May 1961	20-70	20-37	54	5,319	99
June-Aug. Off fishing					
Sept. 1961	20-70	26-40	35	3,325	96
Oct. 61	20-70	24-43	109	6,367	59
Nov. 61	20-70, 21-69	25-50	113	5,723	51
Dec. 61	20-70, 21-69	28-39	103	9,119	89
Jan. 1962	20-70, 21-69	30-44	51	3,771	75
Feb. 62	20-70, 21-69	27-35	56	7,645	136
Mar. 62	20-70	24-44	97	6,342	66
Apr. 62	20-70	26-43	61	10,002	165
May 62	20-70	27-39	64	5,095	80
June-Sept. Off fishing					
Oct. 1962	20-70	28-37	15	2,110	143
Nov. 62	20-70, 21-71	26-58	87	12,366	142
Dec. 62	20-70, 21-69, 20-69	24-60	95	13,402	141
Jan. 1963	20-70	24-48	48	9,362	196
Feb. 63	20-70, 21-70	24-54	74	18,751	255
Mar. 63	20-70, 21-70, 21-69	24-44	50	12,778	255
Apr. 63	20-70	22-44	87	19,016	219

The areas and depth ranges of maximum concentration of 'all fish' and the chief categories of fishes were found out by comparing the catch per hour (CPH or CPUE) and they were as follows. The percentage contribution by different categories is given in brackets.

'All fish'—

21-70/1A; 20-70/6A, 6B, 5B—38-40 metres.

Sharks and Skates—

20-70/6A—35-37 m. (10%)

Rays—

20-70/6B, 5B; 38-40 m (20%)

Kati (*Ilisha*)—

20-70/5D; 29-31 m (3%)

Catfish (*Arius*)—

20-70/6A, 6B, 21-69/5B; 35-37 m (4%)

Wam (*Muraenesox talabonoides*)—

20-70/5B, 20-69/6F; 47-49 m (1%)

Pervi (*Lactarius lactarius*)—

20-70/5A, 5B, 20-69/6F; 50-52 m (6%)

Tam (*Lutjanus*)—

20-70/5A; 35-37 m (3%)

Karkara (*Pomadasya hasta*)—

20-70/4E; 41-43 m (2%)

Ghol (*Pseudosiaena diacanthus*)—

20-70/5B, 4E; 38-40 m (4%)

Dhoma (Small *Sciaenids*)—

20-70/6A, 6B, 21-70/1A; 29-31 m (31%)

Red Bream (*Argyrops spinifer*)—

20-70/5B, 4C, 4B; 44-46 m (11%)

Dara, Koth and Rawas which are rich in Bombay and Dwarka areas are less common in the Veraval area. The above findings are well in agreement with those of Jayaraman *et al.*¹⁰

The vessels operated many unnamed trawls Larsen trawl, Shrimp trawl, and Japanese trawl with different headrope and footrope lengths and the 12-metre Russian trawl. Of all these, the 12-metre Russian trawl proved to be the most efficient, and this accounts for the high catch per hour during the end of the survey (Table II).

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T. E. SIVAPRAKASAM

Southern Regional Station,
Zoological Survey of India,
Madras-4.
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