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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 Fishery Data Centre 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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Cover photo: Fish landing centre at Rameswaram

ESTIMATION OF MARINE FISH PRODUCTION IN INDIA

The present exploitation of marine fisheries in India is limited to only a narrow belt of the continental shelf, harvesting about 1.35 million tonnes of fish. The necessity of developing and expanding the marine fisheries has assumed greater importance especially in view of the shortage of food on land and also to meet the deficiency in the much needed protein in our diet. A wide range of statistical informations are necessary to formulate a realistic plan for the development of marine fisheries in India. The more accurate the basic statistical data are, the plans or programmes drawn-up will be more realistic or correct.

In India, the fishing has been a traditional occupation of a section of people from time immemorial. The absence of any organised fishing industry in early times handicapped the scheme of collection of scientific data for the estimation of marine fish production, fishing effort etc. Although in recent times mechanisation of fishing craft has enabled the fishermen to cover a larger area and the improvements in craft and gear have made the catching of fish more efficient, many fishermen of the country still follow the traditional fishing methods using indigenous fishing crafts.

The marine fishes are landed at about 1300 landing centres spread all along the coastline at almost all hours round the year. Under these conditions collection of basic data by complete enumeration as done in some of the developed countries is not possible and the adoption of a suitable sampling technique is the only choice. The sampling design thus formulated should also take into consideration the collection of other biological data which will reveal the knowledge of either the absolute magnitude or some relative indices of abundance of various exploitable stocks of fishes which is so necessary that the optimum sustainable yield may be derived from these stocks, maintaining at the same time their level.

The first attempt to build up a planned survey for the estimation of fish catch on an all India basis was made after the establishment of the Central Marine Fisheries Research Institute in 1947. In the pilot survey conducted in 1948-49, village-wise data were

collected on the area exploited, the number of persons engaged in marine fishing, the number of various types of fishing boats and nets, fishing season, type of fish caught and the number of fish landing centres. This brought forth a complete picture of fishing activities and threw light on the potentialities of marine fishery.

On the basis of this survey, fisheries data were collected on regular basis from 1950 by dividing the entire coastline of India into twelve homogenous survey zones—each zone put in charge of a well trained field staff for the purpose of collection of all basic data. Fairly accurate estimates of marine fish production in India were arrived at from the sample estimates of each zone. With the availability of more funds and additional staff, the survey zones were further increased from twelve to twenty in 1957 covering more landing centres. Additional data on fishing effort were also collected from that year. Between 1950-51 and 1954-55 the Indian Council of Agricultural Research also initiated a number of pilot surveys of various designs in different regions of the country with a view to evolving most suitable sampling design for the estimation of fish landings in the country. The pilot surveys and their results have influenced a great deal in moulding the currently designed sample surveys undertaken by the Central Marine Fisheries Research Institute. To bring out the nature of changing pattern of fishing industry and its consequent impact on fishermen and to develop the sampling design according to changing field conditions, census of fishing villages were repeated during 1957-58, 1961-62 and 1972-73. Since any betterment plan of fishing industry must also aim at betterment of the condition of fishermen engaged in fishing, socio-economic data with regard to them are also necessary. During the 1972-73 census this information was also collected.

The present sampling design involving space-time stratification was first put into operation in the Kerala State in the middle of 1959 and was slowly extended to other states of the west coast of India. From 1961 the design was introduced in the east coast of India also. A number of geographically contiguous landing centres form the stratum in space. A ten-day period of a

month is the time-stratum. The primary sampling unit is a centre-day or a centre-two days group. Sampling is also adopted over hours of the selected day and the enumeration units, which are landing boats, are selected on a systematic way. The night catches are obtained by enquiry from fishermen. On the basis of the estimates made for the primary sampling units, stratum estimates and their percentage error are arrived at. The period of estimation is a calendar month. Additional data on size composition of the catch of the most important fishes like oil sardines, mackerel and Bombay

duck and also of penaeid prawns are collected for the study of stock assessment of these fisheries. This enables to get the abundance of size and age composition of the catch leading to estimation of mortality parameters.

Thus over the years the Institute has developed capability for providing variety-wise estimates of marine fish production with seasonal and regional break-up along with estimates of fishing effort according to different types of fishing units and also in terms of man hours.

TRENDS IN TOTAL MARINE FISH PRODUCTION IN INDIA—1977 *

The total marine fish production in India during 1977 was estimated at 1.26 million tonnes as against 1.35 million tonnes during 1976, showing an overall decline of about 93000 tonnes (6.9%). This reduction in the total catch was mainly brought about by the lower landings in all the maritime states along the east coast as well as in Goa and Maharashtra in the west coast of India (Table 1).

Table 1 *Statewise marine fish landings in India (in tonnes) during the years 1976 and 1977*

State	1977	1976
1. West Bengal	6,689	25,411
2. Orissa	15,072	29,823
3. Andhra Pradesh	100,756	131,321
4. Tamil Nadu	206,046	226,078
5. Pondicherry	6,462	10,123
6. Kerala	345,037	331,047
7. Karnataka	97,152	95,283
8. Goa	24,731	34,968
9. Maharashtra	264,452	293,601
10. Gujarat	189,638	171,294
11. Andamans	1,532	1,334
12. Lakshadweep	2,215	2,572
TOTAL	12,59,782	13,52,855

The details of fish landings during 1977 are shown in Table 2. Oil sardine catch along the coasts of Kerala and Karnataka during 1977 showed a decline from that of the previous year. This fluctuation may probably be attributed to the unsuccessful spawning and recruitment to the inshore fishery, as indicated by the good catches of oil sardines netted by the purse seine operations conducted off Mangalore and Karwar.

The landings of lesser sardines and anchovies also showed a declining trend during the year. The coastal belt between Cape Comorin and Quilon has been found to be the most productive region for anchovies and white baits. There seems to be a possibility of increasing the catch of these fishes between Quilon and Ratnagiri by extending the fishing operations to off-shore waters.

The catch of mackerel during the year showed a marginal decrease as compared to 1976. The recruitment started earlier in the south than in the north along the west coast. The one-year old fish dominated the catch along the west coast except in southern observation centres where 0-year old predominated. A review of the mackerel fishery in the country during the past 2 decades shows that the fish shoals remain in the shelf waters throughout the year, mostly confined to shallow region below 30 metres depth. The bulk of the catch in the country comes from the region extending from Quilon in Kerala coast to Ratnagiri in Maharashtra coast.

Bombay duck fishery was also not successful as the catch showed a marginal decline at all India level. While the landings in Maharashtra did not show appreciable change, it was poor in Gujarat. The catch of penaeid prawns declined considerably, mainly due to reduced landings in the states of West Bengal, Andhra Pradesh, Tamil Nadu, Goa, Maharashtra and Gujarat. Non-penaeid prawns showed only slight decrease due to poor catch in Gujarat. Cat fishes, perches and sciaenids recorded higher landings in the states of Tamil Nadu, Kerala, Karnataka, and Gujarat.

The catch per man hour during 1977 was computed at 5.03 kg as compared to 5.27 kg in 1976.

Table 2 Statewise composition of marine fish landings in India during 1977 (In tonnes)

Sl. No.	Name of fish	West Bengal	Orissa	Andhra-Pradesh	Tamil Nadu	Pondicherry	Kerala	Karnataka	Goa	Maha-rashtra	Gujarat	Andaman & Nichobar	Laksha-dweep	Total	Total for 1976
1.	Elasmobranchs	73	1,658	6,450	18,327	352	5,796	3,238	625	7,746	17,565	90	296	62,216	54,605
2.	Eels	1	—	438	232	5	6	3	—	3,849	8,463	—	—	12,997	8,296
3.	Catfishes	134	1,035	5,662	15,205	137	7,947	5,162	918	8,318	8,958	28	—	53,504	43,540
4.	<i>Chirocentrus</i>	107	752	1,217	2,475	63	547	717	32	2,634	3,327	38	—	11,909	10,368
5. a.	Oil Sardines	—	—	—	714	—	117,356	31,145	807	108	—	—	—	150,130	169,262
b.	Lesser Sardines	—	1,227	10,972	26,259	1,156	20,754	180	4,066	1,024	—	86	—	65,724	100,000
c.	<i>Hilsa ilisha</i>	96	2,948	41	343	—	36	44	—	352	329	—	—	4,189	7,842
d.	Other <i>Hilsa</i>	—	492	1,654	5,784	43	14	113	1	978	5,547	25	—	14,651	8,482
e.	<i>Anchoviella</i>	4	486	8,947	13,388	548	10,105	174	9	269	—	103	—	34,033	30,069
f.	<i>Thrissoctes</i>	365	197	1,398	3,008	405	1,648	831	293	1,679	105	—	—	9,929	17,660
g.	Other clupeids	705	778	2,363	2,652	—	512	1,677	520	22,782	9,458	11	—	41,458	57,164
6. a.	<i>Harpodon nehereus</i>	1,060	86	960	14	—	—	4	20	50,803	32,289	—	—	85,236	87,075
b.	<i>Saurida & Saurus</i>	—	5	875	572	103	5,169	385	239	1,135	42	—	—	8,525	5,292
7.	<i>Hemirhamphus & Belone</i>	—	—	135	1,574	4	281	57	13	32	104	53	58	2,311	1,169
8.	Flying fish	—	—	84	526	3	—	—	—	—	—	—	30	643	1,439
9.	Perches	—	55	2,727	7,918	391	14,121	1,489	505	2,973	1,213	196	211	31,799	18,162
10.	Red mullets	—	1	315	832	32	240	19	—	171	779	4	29	2,422	5,216
11.	Polynemids	25	406	698	1,592	5	69	3	1	862	268	—	—	3,929	14,573
12.	Sciaenids	819	312	10,182	13,756	258	11,965	2,762	2,779	17,086	39,968	—	—	99,887	87,581
13.	Ribbon fish	306	174	8,546	4,594	143	7,440	237	449	6,338	14,180	—	—	42,407	64,542
14. a.	<i>Caranx</i>	—	103	4,003	6,120	490	15,673	760	1,149	1,167	1,002	134	65	30,666	25,745
b.	<i>Chorinemus</i>	12	386	530	1,465	5	540	506	44	230	401	—	—	4,119	3,322
c.	<i>Trachynotus</i>	—	—	—	73	—	7	—	—	—	—	—	—	80	35
d.	Other carangids	—	—	78	22	—	78	—	—	—	—	—	—	219	1,572
e.	<i>Coryphaena</i>	—	1	137	58	2	28	—	—	—	—	—	—	226	261
f.	<i>Elacate</i>	—	9	7	230	1	158	1	23	—	—	—	—	429	383
15. a.	<i>Leiognathus</i>	15	233	5,903	17,783	318	7,708	1,631	458	358	—	97	—	34,504	42,445
b.	<i>Gazza</i>	—	—	—	54	7	—	—	—	—	—	—	—	61	966
16.	<i>Lactarius</i>	1	18	1,132	740	175	823	101	375	247	7,349	—	—	10,961	12,045
17.	Pomfrets	143	1,018	2,529	628	53	3,712	249	296	17,295	9,174	30	—	35,127	37,701
18.	Mackerel	—	195	1,040	5,674	398	19,968	26,214	7,661	875	—	111	—	62,136	65,497
19.	Seer fish	32	672	3,261	6,424	34	3,250	1,831	213	3,220	2,022	119	41	21,119	20,159
20.	Tunnies	—	37	449	3,238	—	6,705	622	107	312	332	37	1,166	13,005	19,322
21.	<i>Sphyraena</i>	—	3	108	1,702	9	353	3	—	—	154	76	15	2,423	2,385
22.	<i>Mugil</i>	—	—	170	923	14	38	—	46	48	900	130	—	2,269	2,613
23.	<i>Bregmaceros</i>	—	—	—	—	—	—	—	—	30	—	—	—	30	380
24.	Soles	—	72	680	908	78	5,778	985	335	1,245	729	—	—	10,810	10,088
25. a.	Penaeid prawns	602	802	6,266	8,197	103	40,150	3,335	1,436	26,675	8,861	45	—	96,472	114,640
b.	Non-penaeid prawns	269	17	5,109	159	2	174	—	24	66,978	1,260	—	—	75,587	76,787
c.	Lobsters	—	—	2	286	20	40	4	7	434	424	—	—	1,217	2,532
d.	Crabs	—	6	719	11,018	296	4,621	144	361	93	2,471	—	—	19,729	19,999
e.	Other crustaceans	—	—	—	—	—	—	63	276	—	—	—	—	339	—
26.	Cephalopods	—	—	408	1,375	62	4,973	965	164	596	1,439	—	23	10,005	10,826
27.	Miscellaneous	1,920	888	4,561	19,204	747	26,254	11,457	479	15,510	10,525	119	281	91,945	90,812
TOTAL		6,689	15,072	100,756	206,046	6,462	345,037	97,152	24,731	264,452	189,638	1,532	2,215	12,59,782	13,52,855

MARINE FISH PRODUCTION IN INDIA DURING JANUARY TO JUNE 1978*

Total production for the half year

The total marine fish production in India (excluding Andamans and Lakshadweep) during the first half of 1978 was provisionally estimated at 530,056 tonnes as compared to 564,184 tonnes during the corresponding period in 1977, showing a decline of about 30,000 tonnes (5.38%). While the total landings in West Bengal, Orissa, Andhra and Maharashtra declined,

Tamil Nadu, Kerala, Karnataka, Goa and Gujarat recorded comparatively higher landings. The production in Pondicherry remained more or less stationary. The monthwise total landings of marine fish in the various maritime states of India (excluding Andamans and Lakshadweep) and the species-wise catch details for the period January to June, 1978 are shown in Fig. 1 and Tables 1 and 2. Maximum landings are noticed in January and minimum in June.

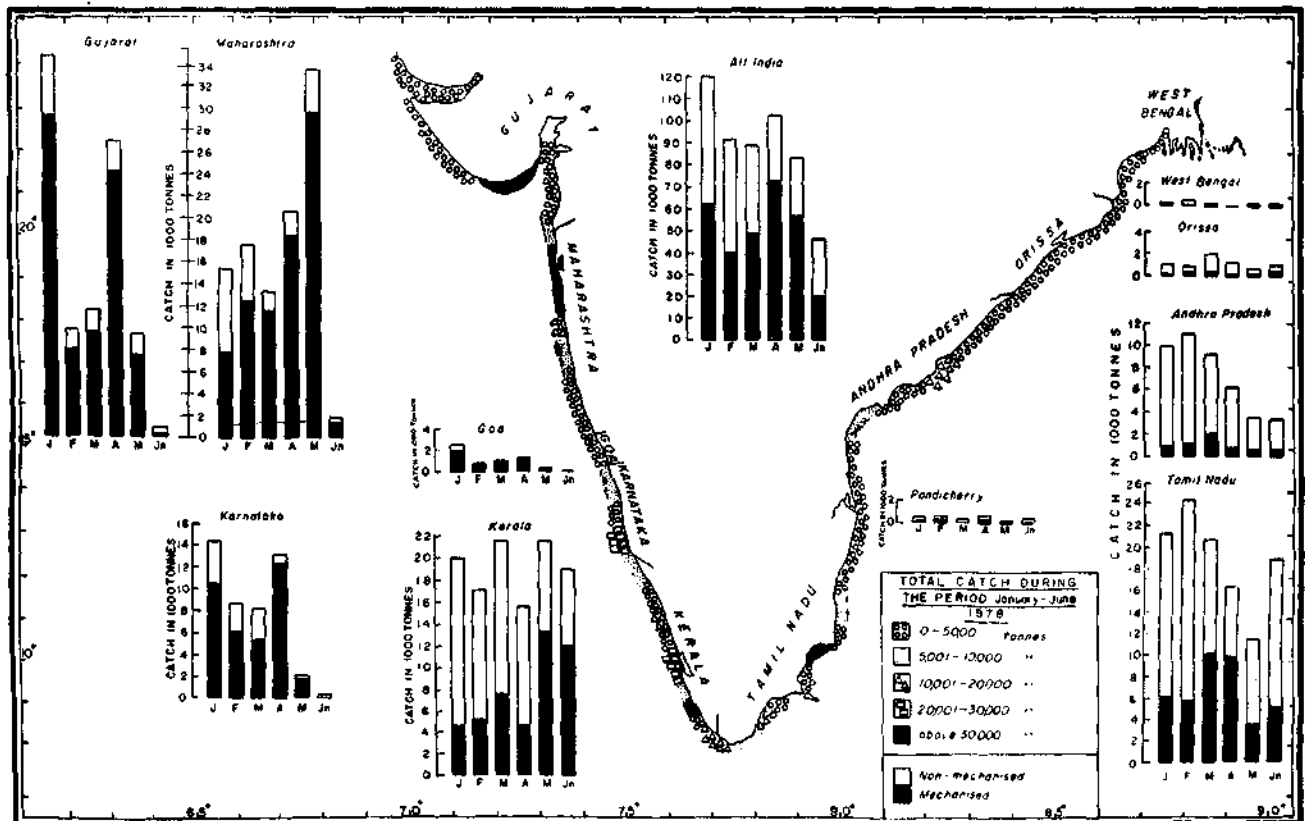


Fig. 1 Total marine fish landings in different states during January to June 1978

* Prepared by the Fishery Resources Assessment Division.

Table 1 Statewise and monthwise total marine fish production in India during the period January to June 1978* (in tonnes)

Sl. No.	Name of State	January	February	March	April	May	June	Total	Total for January to June 1977
1.	West Bengal	198	491	188	53	150	292	1,372	4,133
2.	Orissa	1,063	874	1,954	1,194	687	1,054	6,826	7,302
3.	Andhra Pradesh	9,866	10,978	9,178	6,186	3,472	3,443	43,123	61,291
4.	Tamil Nadu	21,156	24,193	20,679	16,439	11,594	18,886	112,947	83,476
5.	Pondicherry	466	602	342	658	254	438	2,760	2,783
6.	Kerala	20,023	17,149	21,710	15,564	21,519	18,948	114,913	113,994
7.	Karnataka	14,398	8,792	8,267	13,169	2,099	293	47,018	28,140
8.	Goa	2,511	679	1,087	1,167	325	15	5,784	5,621
9.	Maharashtra	15,373	17,598	13,293	20,634	33,393	1,775	102,066	167,487
10.	Gujarat	34,670	9,826	11,606	26,854	9,381	910	93,247	89,957
	Total	119,724	91,182	88,304	101,918	82,874	46,054	530,056	564,184

*Provisional

Pelagic and demersal group of fishes

The species contributing to the catch may be divided into two groups—pelagic and demersal. The pelagic group consists of *Chirocentrus*, sardines, *Hilsa* spp., anchovies and white baits, other clupeids, Bombay duck, *Hemirhamphus* & *Belone*, flying fish, ribbon fish, carangids, mackerel, seer fish, tunnies, *Sphyraena*, mullets and *Bregmaceros* spp. The elasmobranchs, eels, cat fishes, lizard fishes, perches, red mullets, polynemids, sciaenids, silver bellies, *Lactarius*, pomfrets, soles, prawns, lobsters and cephalopods form the demersal group. The statewise distribution of pelagic and demersal group of fishes is shown in Fig. 2.

Kerala, Karnataka, Andhra, Orissa and Pondicherry land higher catch of pelagic fishes. The demersal fishes are predominantly caught in the States of Maharashtra, Gujarat, Tamil Nadu, Goa and West Bengal. While Kerala recorded the highest catch of pelagic fishes, Maharashtra contributed the maximum catch of demersal fishes.

Statewise production

West Bengal

The total marine fish production in West Bengal declined by about 2,800 tonnes, as compared to the first half of 1977 (Table 1). While the landings of sciaenids, *Harpodon nehereus*, *Thrissocles*, other clupeids, ribbon fish, penaeid and non-penaeid prawns

were comparatively poor, the catch of soles and seer fish showed an increasing trend. Table 3 shows the monthwise and specieswise landings of marine fish in West Bengal during the period January to June 1978. The maximum catch was in February and the minimum in April.

Orissa

A decrease of about 500 tonnes in the total catch was noticed in this State while comparing the estimates for the corresponding half of 1977. A significant increase in the landings of elasmobranchs, *Chirocentrus*, lesser sardines, *Anchoviella*, and pomfrets, was seen during the period January to June 1978. The landings

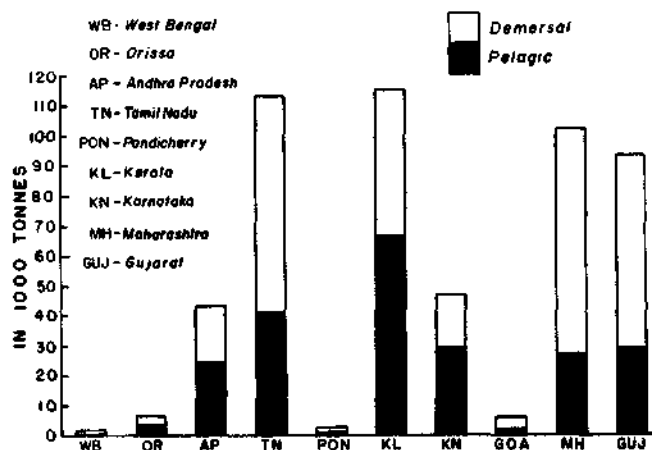


Fig. 2 Pelagic and demersal fish catch in different states during January to June 1978.

Table 2 Statewise composition of marine fish landings in India (excluding Andamans and Lakshadweep) for the period January to June 1978 (in tonnes)*

Sl. No.	Name of fish	West Bengal	Orissa	Andhra Pradesh	Tamil Nadu	Pondicherry	Kerala	Karnataka	Goa	Maha-rashtra	Gujarat	Total
1.	Elasmobranchs	38	735	4,383	11,243	87	4,064	1,003	158	4,284	10,554	36,549
2.	Eels	—	—	1,017	194	—	36	3	55	2,606	1,253	5,164
3.	Cat fishes	34	308	1,696	3,637	16	4,577	951	451	6,330	2,459	20,459
4.	<i>Chirocentrus</i>	55	316	453	905	32	2,903	101	28	1,253	1,525	7,571
5. a)	Oil sardines	—	—	—	47	—	25,182	12,143	58	—	—	37,430
b)	Other sardines	2	910	4,941	14,005	532	4,181	1,358	770	329	—	27,028
c)	<i>Hilsa ilisha</i>	12	940	1	174	—	87	8	—	845	14	2,081
d)	Other <i>Hilsa</i>	—	257	1,196	1,778	92	122	8	—	142	3,547	7,142
e)	<i>Anchoviella</i>	10	1,120	6,140	1,630	263	5,335	58	—	241	—	14,797
f)	<i>Thrissocles</i>	51	22	877	3,982	119	416	43	44	851	393	6,798
g)	Other clupeids	117	240	955	2,068	69	329	94	107	5,459	3,951	13,389
6. a)	<i>Harpodon nehereus</i>	111	8	166	—	—	21	2	—	10,195	6,905	17,408
b)	<i>Saurida & Saurus</i>	—	5	338	299	66	2074	84	129	1,276	259	4,530
7.	<i>Hemirhamphus & Belone</i>	11	—	6	279	—	218	21	18	7	1	561
8.	Flying fish	—	—	—	220	67	—	—	—	1	—	288
9.	Perches	—	84	1,353	8,125	208	1,641	117	231	3,667	3,395	18,821
10.	Red mullets	—	1	128	648	16	66	6	—	526	2	1,393
11.	Polynemids	17	144	798	550	6	14	3	1	822	55	2,410
12.	Sciaenids	92	58	2,807	8,502	115	5,712	715	588	7,046	20,683	46,318
13.	Ribbon fish	117	15	2,468	4,223	45	4,571	184	349	4,741	6,244	22,957
14. a)	<i>Caranx</i>	2	26	1,271	1,371	76	2,264	147	443	498	256	6,354
b)	<i>Chorinemus</i>	12	188	433	912	26	21	12	4	54	106	1,768
c)	<i>Trachynotus</i>	—	—	—	87	—	19	3	—	—	—	109
d)	Other carangids	—	—	40	15	—	—	23	—	10	—	88
e)	<i>Coryphaena</i>	—	—	—	22	—	16	—	—	—	—	38
f)	<i>Elacate</i>	—	1	53	221	—	55	52	—	—	—	382
15. a)	<i>Letognathus</i>	51	76	1,108	15,859	155	1,546	442	184	106	—	19,527
b)	<i>Gazza</i>	—	—	—	8	—	—	—	—	—	—	8
16.	Lactarius	—	8	389	424	—	309	80	231	456	7,112	9,009
17.	Pomfrets	48	564	914	677	33	934	1,359	25	3,513	3,959	12,026
18.	Mackerel	—	127	2,403	1,193	81	10,247	6,008	27	94	—	20,180
19.	Seer fish	20	274	1,414	1,867	12	890	450	59	438	1,592	7,016
20.	Tunnies	—	34	149	661	—	3,663	32	6	447	307	5,299
21.	<i>Sphyraena</i>	—	3	31	426	3	266	—	—	95	—	824
22.	<i>Mugil</i>	—	3	111	887	26	1	1	11	37	444	1,521
23.	<i>Bregmaceros</i>	—	—	—	—	—	—	—	—	19	3	22
24.	Soles	24	1	214	994	38	4,073	341	200	947	310	7,142
25. a)	Penaeid prawns	178	80	2,096	6,781	180	16,730	5,658	929	12,257	2,320	47,209
b)	Non-penaeid prawns	127	—	195	155	38	208	6	—	25,001	752	26,482
c)	Lobsters	—	—	10	127	2	4	36	8	209	466	862
d)	Other crustaceans	—	2	254	6,489	91	1,059	1,690	332	78	350	10,345
26.	Cephalopods	30	2	94	295	24	861	37	34	2,214	3,404	6,995
27.	Miscellaneous	213	274	2,221	10,967	242	10,198	13,739	304	4,972	10,626	53,756
Total		1,372	6,826	43,123	112,947	2,760	114,913	47,018	5,784	102,066	93,247	530,056

* Provisional

Table 3 Composition of marine fish landings in West Bengal during the half year ending June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	Mar.	April	May	June	Total
1.	Elasmo-branches	—	—	20	—	6	12	38
2.	Eels	—	—	—	—	—	—	—
3.	Cat fishes	—	—	16	—	16	2	34
4.	<i>Chirocentrus</i>	2	23	—	—	16	14	55
5.	a) Oil sardines	—	—	—	—	—	—	—
	b) Other sardines	—	2	—	—	—	—	2
	c) <i>Hilsa ilisha</i>	—	2	2	4	4	—	12
	d) Other <i>Hilsa</i>	—	—	—	—	—	—	—
	e) <i>Anchoviella</i>	—	2	—	—	2	6	10
	f) <i>Thrisso-cles</i>	8	25	2	2	2	12	51
	g) Other clupeids	22	20	16	15	10	34	117
6.	a) <i>Harpodon nehereus</i>	22	20	16	1	18	34	111
	b) <i>Saurida & Saurus</i>	—	—	—	—	—	—	—
7.	<i>Hemirhamphus & Belone</i>	—	11	—	—	—	—	11
8.	Flying fish	—	—	—	—	—	—	—
9.	Perches	—	—	—	—	—	—	—
10.	Red mullets	—	—	—	—	—	—	—
11.	Poly-nemids	—	5	6	—	—	6	17
12.	Sciaenids	30	12	12	4	8	26	92
13.	Ribbon fish	14	71	10	6	—	16	117
14.	a) <i>Caranx</i>	—	2	—	—	—	—	2
	b) <i>Chorinemus</i>	—	—	8	—	4	—	12
	c) <i>Trachy-notus</i>	—	—	—	—	—	—	—
	d) Other carangids	—	—	—	—	—	—	—
	e) <i>Coryphaena</i>	—	—	—	—	—	—	—
	f) <i>Elacate</i>	—	—	—	—	—	—	—
15.	a) <i>Leiognathus</i>	—	29	—	—	2	20	51
	b) <i>Gazza</i>	—	—	—	—	—	—	—
16.	<i>Lactarius</i>	—	—	—	—	—	—	—
17.	Pomfrets	6	12	20	2	6	2	48
18.	Mackerel	—	—	—	—	—	—	—
19.	Seer fish	—	—	8	—	4	8	20
20.	Tunnies	—	—	—	—	—	—	—
21.	<i>Sphyraena</i>	—	—	—	—	—	—	—
22.	<i>Mugil</i>	—	—	—	—	—	—	—
23.	<i>Bregmaceros</i>	—	—	—	—	—	—	—
24.	Soles	—	24	—	—	—	—	24
25.	a) Penaeid prawns	24	60	24	8	22	40	178
	b) Non-penaeid prawns	10	107	4	—	2	4	127
	c) Lobsters	—	—	—	—	—	—	—
	d) Other crustaceans	—	—	—	—	—	—	—
26.	Cephalopods	—	30	—	—	—	—	30
27.	Miscellaneous	60	34	24	11	28	56	213
Total		198	491	188	53	150	292	1,372

Table 4 Composition of marine fish landings in Orissa during the half year ending June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	March	April	May	June	Total
1.	Elasmo-branches	106	135	104	134	120	136	735
2.	Eels	—	—	—	—	—	—	—
3.	Cat fishes	54	76	61	38	43	36	308
4.	<i>Chirocentrus</i>	86	46	50	43	40	51	316
5.	a) Oil sardines	—	—	—	—	—	—	—
	b) Other sardines	240	25	374	137	134	—	910
	c) <i>Hilsa ilisha</i>	128	132	163	98	81	338	940
	d) Other <i>Hilsa</i>	52	14	75	17	49	50	257
	e) <i>Anchoviella</i>	—	32	724	357	5	2	1120
	f) <i>Thrisso-cles</i>	5	3	7	4	3	—	22
	g) Other clupeids	48	21	39	70	21	41	240
6.	a) <i>Harpodon nehereus</i>	4	—	—	—	—	4	8
	b) <i>Saurida & Saurus</i>	3	2	—	—	—	—	5
7.	<i>Hemirhamphus & Belone</i>	—	—	—	—	—	—	—
8.	Flying fish	—	—	—	—	—	—	—
9.	Perches	3	80	1	—	—	—	84
10.	Red mullets	—	—	1	—	—	—	1
11.	Polynemids	28	18	38	20	16	24	144
12.	Sciaenids	6	9	12	16	1	14	58
13.	Ribbon fish	—	—	—	—	5	10	15
14.	a) <i>Caranx</i>	1	4	4	4	2	11	26
	b) <i>Chorinemus</i>	52	28	42	20	18	28	188
	c) <i>Trachy-notus</i>	—	—	—	—	—	—	—
	d) Other carangids	—	—	—	—	—	—	—
	e) <i>Coryphaena</i>	—	—	—	—	—	—	—
	f) <i>Elacate</i>	—	1	—	—	—	—	1
15.	a) <i>Lelognathus</i>	8	11	6	36	11	4	76
	b) <i>Gazza</i>	—	—	—	—	—	—	—
16.	<i>Lactarius</i>	3	5	—	—	—	—	8
17.	Pomfrets	105	54	96	68	61	180	564
18.	Mackerel	19	61	40	7	—	—	127
19.	Seer fish	42	53	55	36	35	53	274
20.	Tunnies	13	16	5	—	—	—	34
21.	<i>Sphyraena</i>	—	3	—	—	—	—	3
22.	<i>Mugil</i>	1	2	—	—	—	—	3
23.	<i>Bregmaceros</i>	—	—	—	—	—	—	—
24.	Soles	—	—	—	1	—	—	1
25.	a) Penaeid prawns	4	1	—	41	7	27	80
	b) Non-penaeid prawns	—	—	—	—	—	—	—
	c) Lobsters	—	—	—	—	—	—	—
	d) Other crustaceans	—	—	—	—	—	2	2
26.	Cephalopods	—	—	—	—	2	—	2
27.	Miscellaneous	52	42	57	47	33	43	274
Total		1,063	874	1,954	1,194	687	1,054	6,826

Table 5 Composition of marine fish landings in Andhra Pradesh during January to June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	March	April	May	June	Total
1.	Elasmo-branchs	1,015	802	1,652	253	254	407	4,383
2.	Eels	750	65	121	29	20	32	1,017
3.	Cat fishes	401	132	338	341	114	370	1,696
4.	<i>Chiro-centrus</i>	42	153	126	4	119	9	453
5.	a) Oil sardines	—	—	—	—	—	—	—
	b) Other sardines	2,072	1,024	771	1,009	32	33	4,941
	c) <i>Hilsa ilisha</i>	—	1	—	—	—	—	1
	d) Other <i>Hilsa</i>	56	565	432	111	—	32	1,196
	e) <i>Ancho-viella</i>	948	2,572	301	1,493	799	27	6,140
	f) <i>Thris-socles</i>	198	154	261	36	23	205	877
	g) Other clupeids	149	281	116	29	82	298	955
6.	a) <i>Harpodon nehereus</i>	72	61	17	2	1	13	166
	b) <i>Saurida & Saurus</i>	50	122	48	49	39	30	338
7.	<i>Hemir-hamphus & Belone</i>	—	1	1	—	—	4	6
8.	Flying fish	—	—	—	—	—	—	—
9.	Perches	372	317	348	135	90	91	1,353
10.	Red mullets	19	50	17	19	7	16	128
11.	Polynemids	504	95	88	64	2	45	798
12.	Sciaenids	618	566	662	257	243	461	2,807
13.	Ribbon fish	258	191	176	1,214	344	285	2,468
14.	a) <i>Caranx</i>	181	194	460	65	238	133	1,271
	b) <i>Chori-nemus</i>	92	104	83	97	29	28	433
	c) <i>Trachy-notus</i>	—	—	—	—	—	—	—
	d) Other carangids	19	1	15	5	—	—	40
	e) <i>Cory-phaena</i>	—	—	—	—	—	—	—
	f) <i>Elacate</i>	33	20	—	—	—	—	53
15.	a) <i>Lelog-nathus</i>	126	231	236	198	265	52	1,108
	b) <i>Gazza</i>	—	—	—	—	—	—	—
16.	<i>Lactarius</i>	152	112	38	61	8	18	389
17.	Pomfrets	310	196	86	82	116	124	914
18.	Mackerel	11	1,315	1,068	8	1	—	2,403
19.	Seer fish	335	518	312	35	130	84	1,414
20.	Tunnies	62	—	72	—	15	—	149
21.	<i>Sphyraena</i>	17	5	2	1	—	6	31
22.	<i>Mugil</i>	1	4	5	57	4	40	111
23.	<i>Breg-maceros</i>	—	—	—	—	—	—	—
24.	Soles	52	27	45	30	42	18	214
25.	a) Penaeid prawns	446	454	526	166	217	287	2,096
	b) Non-penaeid prawns	9	29	10	50	2	95	195
	c) Lobsters	—	—	—	3	—	7	10
	d) Other crusta-ceans	21	24	66	54	1	88	254
26.	Cepha-lopods	17	6	30	14	15	12	94
27.	Miscel-laneous	458	586	649	215	220	93	2,221
Total		9,866	10,978	9,178	6,186	3,472	3,443	43,123

Table 6 Composition of marine fish landings in Tamil Nadu for the period January to June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	March	April	May	June	Total
1.	Elasmo-branchs	1,472	3,106	1,619	2,646	686	1,714	11,243
2.	Eels	98	72	8	3	10	3	194
3.	Cat fishes	793	714	628	460	237	805	3,637
4.	<i>Chiro-centrus</i>	171	131	164	74	171	194	905
5.	a) Oil sardines	—	—	32	15	—	—	47
	b) Other sardines	3,968	2,142	2,986	1,080	2,948	881	14,005
	c) <i>Hilsa ilisha</i>	—	—	—	47	118	9	174
	d) Other <i>Hilsa</i>	235	838	410	184	27	84	1,778
	e) <i>Ancho-viella</i>	169	95	225	166	489	486	1,630
	f) <i>Thris-socles</i>	644	1,028	495	999	415	401	3,982
	g) Other clupeids	421	286	359	524	300	178	2,068
6.	a) <i>Harpodon nehereus</i>	—	—	—	—	—	—	—
	b) <i>Saurida & Saurus</i>	85	27	12	25	68	82	299
7.	<i>Hemir-hamphus & Belone</i>	65	24	74	27	12	77	279
8.	Flying fish	—	—	—	1	—	—	219
9.	Perches	547	5,341	553	249	530	905	8,125
10.	Red mullets	107	20	72	88	145	216	648
11.	Poly-nemids	184	82	28	68	52	136	550
12.	Sciaenids	1,699	1,383	2,218	1,875	481	846	8,502
13.	Ribbon fish	174	196	63	19	106	3,665	4,223
14.	a) <i>Caranx</i>	384	123	206	72	324	262	1,371
	b) <i>Chori-nemus</i>	496	36	131	40	71	138	912
	c) <i>Trachy-notus</i>	17	16	6	34	10	4	87
	d) Other carangids	—	—	1	14	—	—	15
	e) <i>Cory-phaena</i>	7	5	4	6	—	—	22
	f) <i>Elacate</i>	67	45	27	59	10	13	221
15.	a) <i>Lelog-nathus</i>	2,354	2,524	4,538	2,419	1,486	2,538	15,859
	b) <i>Gazza</i>	8	—	—	—	—	—	8
16.	<i>Lactarius</i>	118	34	28	1	19	224	424
17.	Pomfrets	93	3	314	33	158	76	677
18.	Mackerel	198	275	189	280	67	184	1,193
19.	Seer fish	730	325	381	148	118	165	1,867
20.	Tunnies	219	119	61	24	221	17	661
21.	<i>Sphyraena</i>	77	48	15	18	93	175	426
22.	<i>Mugil</i>	304	527	17	12	—	27	887
23.	<i>Breg-maceros</i>	—	—	—	—	—	—	—
24.	Soles	184	101	154	284	125	146	994
25.	a) Penaeid prawns	1,708	1,462	1,178	892	464	1,077	6,781
	b) Non-penaeid prawns	—	10	35	5	35	70	155
	c) Lobsters	33	42	14	23	13	2	127
	d) Other crusta-ceans	536	939	1,753	1,889	526	846	6,489
26.	Cepha-lopods	49	36	85	71	33	21	295
27.	Miscel-laneous	2,742	2,038	1,596	1,565	1,026	2,000	10,967
Total		21,156	24,193	20,679	16,439	11,594	18,886	112,947

Table 7 Composition of marine fish landings in Pondicherry during the period January to June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	Mar.	April	May	June	Total
1.	Elasmo-branches	16	36	2	22	4	7	87
2.	Eels	—	—	—	—	—	—	—
3.	Cat fishes	6	—	—	5	—	5	16
4.	<i>Chirocentrus</i>	11	2	7	9	—	3	32
5. a)	Oil sardines	—	—	—	—	—	—	—
b)	Other sardines	175	93	120	66	9	69	532
c)	<i>Hilsa ilisha</i>	—	—	—	—	—	—	—
d)	Other <i>Hilsa</i>	22	68	2	—	—	—	92
e)	<i>Anchoviella</i>	1	14	6	233	7	2	263
f)	<i>Thrisso-cles</i>	26	5	52	10	14	12	119
g)	Other clupeids	3	—	20	16	26	4	69
6. a)	<i>Harpodon nehereus</i>	—	—	—	—	—	—	—
b)	<i>Saurida & Saurus</i>	—	36	2	20	1	7	66
7.	<i>Hemirhamphus & Belone</i>	—	—	—	—	—	—	—
8.	Flying fish	—	—	—	—	—	67	67
9.	Perches	51	57	16	41	8	35	208
10.	Red mullets	3	2	1	5	2	3	16
11.	Polynemids	1	—	—	2	—	3	6
12.	Sciaenids	15	24	17	15	18	26	115
13.	Ribbon fish	10	5	8	11	9	2	45
14. a)	<i>Caranx</i>	11	22	8	19	2	14	76
b)	<i>Chorinemus</i>	6	14	3	3	—	—	26
c)	<i>Trachy-notus</i>	—	—	—	—	—	—	—
d)	Other carangids	—	—	—	—	—	—	—
e)	<i>Coryphaena</i>	—	—	—	—	—	—	—
f)	<i>Elacate</i>	—	—	—	—	—	—	—
15. a)	<i>Leiognathus</i>	19	63	4	42	12	15	155
b)	<i>Gazza</i>	—	—	—	—	—	—	—
16.	<i>Lactarius</i>	—	—	—	—	—	—	—
17.	Pomfrets	5	4	—	3	20	1	33
18.	Mackerel	6	7	30	7	10	21	81
19.	Seer fish	2	3	5	—	2	—	12
20.	Tunnies	—	—	—	—	—	—	—
21.	<i>Sphyraena</i>	—	2	1	—	—	—	3
22.	<i>Mugil</i>	—	—	—	—	—	26	26
23.	<i>Bregmaceros</i>	—	—	—	—	—	—	—
24.	Soles	9	13	5	4	1	6	38
25. a)	Penaeid prawns	1	62	10	41	36	30	180
b)	Non-penaeid prawns	—	—	—	5	—	33	38
c)	Lobsters	—	1	—	1	—	—	2
d)	Other crustaceans	37	29	8	7	3	7	91
26.	Cephalopods	10	—	—	11	3	—	24
27.	Miscellaneous	20	40	15	60	67	40	242
Total		466	602	342	658	254	438	2,760

Table 8 Composition of marine fish landings in Kerala during the period January to June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	March	April	May	June	Total
1.	Elasmo-branches	496	605	378	257	1,354	974	4,064
2.	Eels	33	1	—	1	—	1	36
3.	Cat fishes	355	401	217	222	1,964	1,418	4,577
4.	<i>Chirocentrus</i>	38	108	2,424	311	16	6	2,903
5. a)	Oil sardines	9,843	4,660	3,370	3,884	2,558	867	25,182
b)	Other sardines	123	735	179	2,292	814	38	4,181
c)	<i>Hilsa ilisha</i>	—	—	2	—	84	1	87
d)	Other <i>Hilsa</i>	122	—	—	—	—	—	122
e)	<i>Anchoviella</i>	977	1,102	2,232	327	322	375	5,335
f)	<i>Thrisso-cles</i>	159	41	95	31	90	—	416
g)	Other clupeids	48	55	34	76	30	86	329
6. a)	<i>Harpodon nehereus</i>	—	2	—	—	—	19	21
b)	<i>Saurida & Saurus</i>	164	134	10	143	1,324	299	2,074
7.	<i>Hemirhamphus & Belone</i>	62	15	5	133	3	—	218
8.	Flying fish	—	—	—	—	—	—	—
9.	Perches	232	618	122	220	217	232	1,641
10.	Red mullets	—	23	9	34	—	—	66
11.	Poly-nemids	1	4	1	—	6	2	14
12.	Sciaenids	258	675	1,910	788	1,109	972	5,712
13.	Ribbon fish	696	148	309	215	131	3,072	4,571
14. a)	<i>Caranx</i>	217	705	601	230	366	145	2,264
b)	<i>Chorinemus</i>	—	11	—	2	2	6	21
c)	<i>Trachy-notus</i>	6	5	8	—	—	—	19
d)	Other carangids	—	—	—	—	—	—	—
e)	<i>Coryphaena</i>	—	5	10	—	1	—	16
f)	<i>Elacate</i>	19	1	5	—	8	22	55
15. a)	<i>Leiognathus</i>	176	542	44	254	154	376	1,546
b)	<i>Gazza</i>	—	—	—	—	—	—	—
16.	<i>Lactarius</i>	14	29	6	48	74	138	309
17.	Pomfrets	245	227	212	32	113	105	934
18.	Mackerel	1,824	2,405	3,183	1,734	660	441	10,247
19.	Seer fish	292	251	36	68	162	81	890
20.	Tunnies	118	586	306	438	1,615	600	3,663
21.	<i>Sphyraena</i>	11	20	59	117	39	20	266
22.	<i>Mugil</i>	—	—	—	—	—	1	1
23.	<i>Bregmaceros</i>	—	—	—	—	—	—	—
24.	Soles	178	461	770	416	870	1,378	4,073
25. a)	Penaeid prawns	872	805	3,393	1,575	4,449	5,636	16,730
b)	Non-penaeid prawns	23	9	91	49	19	17	208
c)	Lobsters	1	2	—	1	—	—	4
d)	Other crustaceans	511	100	287	107	46	8	1,059
26.	Cephalopods	130	491	85	10	101	44	861
27.	Miscellaneous	1,779	1,167	1,317	1,549	2,818	1,568	10,198
Total		20,023	17,149	21,710	15,564	21,519	18,948	114,913

Table 9 Composition of marine fish landings in Karnataka for the period January to June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	March	April	May	June	Total
1.	Elasmo-branches	103	344	88	353	108	7	1,003
2.	Eels	—	3	—	—	—	—	3
3.	Cat fishes	239	363	69	262	7	11	951
4.	<i>Chirocentrus</i>	29	37	5	5	23	2	101
5. a)	Oil sardines	4,164	2,305	3,920	1,560	190	4	12,143
b)	Other sardines	—	6	13	1,331	7	1	1,358
c)	<i>Hilsa ilisha</i>	—	—	8	—	—	—	8
d)	Other <i>Hilsa</i>	—	6	—	2	—	—	8
e)	<i>Anchoviella</i>	—	37	19	1	1	—	58
f)	<i>Thrissoles</i>	2	1	13	4	18	5	43
g)	Other clupeids	12	14	22	23	17	6	94
6. a)	<i>Harpodon nehereus</i>	—	2	—	—	—	—	2
b)	<i>Saurida & Saurus</i>	1	—	—	71	12	—	84
7.	<i>Hemirhamphus & Belone</i>	1	2	10	8	—	—	21
8.	Flying fish	—	—	—	—	—	—	—
9.	Perches	14	2	1	86	14	—	117
10.	Red mullets	—	1	1	2	2	—	6
11.	Poly-nemids	—	—	—	1	2	—	3
12.	Sciaenids	21	104	69	426	48	47	715
13.	Ribbon fish	—	53	20	95	11	5	184
14. a)	<i>Caranx</i>	1	105	16	14	5	6	147
b)	<i>Chorinemus</i>	2	3	—	2	5	—	12
c)	<i>Trachynotus</i>	—	3	—	—	—	—	3
d)	Other carangids	—	—	—	22	—	1	23
e)	<i>Coryphaena</i>	—	—	—	—	—	—	—
f)	<i>Elacate</i>	—	52	—	—	—	—	52
15. a)	<i>Leiognathus</i>	13	60	13	291	16	49	442
b)	<i>Gazza</i>	—	—	—	—	—	—	—
16.	<i>Lactarius</i>	4	2	9	59	5	1	80
17.	Pomfrets	1,179	106	28	42	1	3	1,359
18.	Mackerel	3,246	1,285	827	622	24	4	6,008
19.	Seer fish	74	311	30	18	16	1	450
20.	Tunnies	—	—	—	32	—	—	32
21.	<i>Sphyræna</i>	—	—	—	—	—	—	—
22.	<i>Mugil</i>	—	1	—	—	—	—	1
23.	<i>Bregmaceros</i>	—	—	—	—	—	—	—
24.	Soles	1	24	29	261	23	3	341
25. a)	Penaeid prawns	2,224	791	497	1,812	235	99	5,658
b)	Non-penaeid prawns	—	6	—	—	—	—	6
c)	Lobsters	—	6	7	2	17	4	36
d)	Other crustaceans	20	325	58	1,282	2	3	1,690
26.	Cephalopods	1	34	2	—	—	—	37
27.	Miscellaneous	3,047	2,398	2,493	4,480	1,290	31	13,739
Total		14,398	8,792	8,267	13,169	2,099	293	47,018

Table 10 Composition of marine fish landings in Goa during January to June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	March	April	May	June	Total
1.	Elasmo-branches	115	27	9	5	2	—	158
2.	Eels	—	—	11	44	—	—	55
3.	Cat fishes	172	141	53	64	21	—	451
4.	<i>Chirocentrus</i>	17	5	3	3	—	—	28
5. a)	Oil sardines	41	15	2	—	—	—	58
b)	Other sardines	537	85	44	87	17	—	770
c)	<i>Hilsa ilisha</i>	—	—	—	—	—	—	—
d)	Other <i>Hilsa</i>	—	—	—	—	—	—	—
e)	<i>Anchoviella</i>	—	—	—	—	—	—	—
f)	<i>Thrissoles</i>	11	7	4	13	7	2	44
g)	Other clupeids	15	—	25	46	19	2	107
6. a)	<i>Harpodon nehereus</i>	—	—	—	—	—	—	—
b)	<i>Saurida & Saurus</i>	62	7	49	11	—	—	129
7.	<i>Hemirhamphus & Belone</i>	—	—	—	17	1	—	18
8.	Flying fish	—	—	—	—	—	—	—
9.	Perches	85	27	95	16	8	—	231
10.	Red mullets	—	—	—	—	—	—	—
11.	Poly-nemids	1	—	—	—	—	—	1
12.	Sciaenids	237	73	161	104	13	—	588
13.	Ribbon fish	118	39	72	102	18	—	349
14. a)	<i>Caranx</i>	390	10	4	34	5	—	443
b)	<i>Chorinemus</i>	4	—	—	—	—	—	4
c)	<i>Trachynotus</i>	—	—	—	—	—	—	—
d)	Other carangids	—	—	—	—	—	—	—
e)	<i>Coryphaena</i>	—	—	—	—	—	—	—
f)	<i>Elacate</i>	—	—	—	—	—	—	—
15. a)	<i>Leiognathus</i>	117	10	14	5	38	—	184
b)	<i>Gazza</i>	—	—	—	—	—	—	—
16.	<i>Lactarius</i>	106	38	17	55	15	—	231
17.	Pomfrets	12	4	8	—	1	—	25
18.	Mackerel	26	—	1	—	—	—	27
19.	Seer fish	7	43	1	7	1	—	59
20.	Tunnies	—	6	—	—	—	—	6
21.	<i>Sphyræna</i>	—	—	—	—	—	—	—
22.	<i>Mugil</i>	10	1	—	—	—	—	11
23.	<i>Bregmaceros</i>	—	—	—	—	—	—	—
24.	Soles	57	21	28	72	22	—	200
25. a)	Penaeid prawns	206	79	328	225	88	3	929
b)	Non-penaeid prawns	—	—	—	—	—	—	—
c)	Lobsters	1	—	2	4	1	—	8
d)	Other crustaceans	96	15	71	127	22	1	332
26.	Cephalopods	14	4	9	7	—	—	34
27.	Miscellaneous	54	22	76	119	26	7	304
Total		2,511	679	1,087	1,167	325	15	5,784

Table 11 Composition of marine fish landings in Maharashtra during the period January to June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	Mar.	April	May	June	Total
1.	Elasmo-branches	409	699	412	960	1,716	88	4,284
2.	Eels	193	606	285	734	777	11	2,606
3.	Cat fishes	1,252	1,045	1,399	1,062	1,430	142	6,330
4.	<i>Chirocentrus</i>	627	266	154	167	39	—	1,253
5.	a) Oil sardines	—	—	—	—	—	—	—
	b) Other sardines	151	12	120	27	18	1	329
	c) <i>Hilsa ilisha</i>	802	37	—	1	5	—	845
	d) Other <i>Hilsa</i>	14	28	42	44	14	—	142
	e) <i>Anchoviella</i>	—	—	—	15	218	8	241
	f) <i>Thrissocles</i>	302	103	65	201	178	2	851
	g) Other clupeids	874	1,245	706	745	1,662	227	5,459
6.	a) <i>Harpodon nehereus</i>	1,420	1,039	712	3,387	3,591	46	10,195
	b) <i>Saurida & Saurus</i>	—	238	171	326	541	—	1,276
7.	<i>Hemirhamphus & Belone</i>	—	—	—	3	—	4	7
8.	Flying fish	—	—	—	1	—	—	1
9.	Perches	187	147	747	992	1,567	27	3,667
10.	Red mullets	235	49	1	—	241	—	526
11.	Poly-nemids	89	104	316	242	67	4	822
12.	Sciaenids	1,510	1,511	967	1,057	1,801	200	7,046
13.	Ribbon fish	942	484	664	969	1,539	143	4,741
14.	a) <i>Caranx</i>	34	46	144	123	142	9	498
	b) <i>Chorinemus</i>	16	—	9	4	25	—	54
	c) <i>Trachynotus</i>	—	—	—	—	—	—	—
	d) Other carangids	—	—	10	—	—	—	10
	e) <i>Coryphaena</i>	—	—	—	—	—	—	—
	f) <i>Elacate</i>	—	—	—	—	—	—	—
15.	a) <i>Leiognathus</i>	17	30	16	14	28	1	106
	b) <i>Gazza</i>	—	—	—	—	—	—	—
16.	<i>Lactarius</i>	11	45	132	182	85	1	456
17.	Pomfrets	1,011	611	547	584	729	31	3,513
18.	Mackerel	7	18	45	15	7	2	94
19.	Seer fish	127	49	127	73	61	1	438
20.	Tunnies	—	211	168	68	—	—	447
21.	<i>Sphyraena</i>	1	86	—	4	1	3	95
22.	<i>Mugil</i>	1	1	2	3	7	23	37
23.	<i>Bregmaceros</i>	—	19	—	—	—	—	19
24.	Soles	1	513	28	108	297	—	947
25.	a) Penaeid prawns	1,626	1,606	1,922	2,965	3,860	278	12,257
	b) Non-penaeid prawns	2,769	5,442	2,251	3,661	10,520	358	25,001
	c) Lobsters	10	143	7	23	18	8	209
	d) Other crustaceans	24	—	3	39	6	6	78
26.	Cephalopods	32	124	171	949	938	—	2,214
27.	Miscellaneous	679	1,041	950	886	1,265	151	4,972
Total		15,373	17,598	13,293	20,634	33,393	1,775	1,02,066

Table 12 Composition of marine fish landings in Gujarat during January to June 1978 (in tonnes)

Sl. No.	Name of fish	Janu.	Feb.	March	April	May	June	Total
1.	Elasmo-branches	4,486	709	1,287	3,013	980	79	10,554
2.	Eels	501	169	313	261	8	1	1,253
3.	Cat fishes	919	230	302	383	359	266	2,459
4.	<i>Chirocentrus</i>	676	228	258	309	54	—	1,525
5.	a) Oil sardines	—	—	—	—	—	—	—
	b) Other sardines	—	—	—	—	—	—	—
	c) <i>Hilsa ilisha</i>	—	—	—	11	2	1	14
	d) Other <i>Hilsa</i>	1,423	402	601	754	350	17	3,547
	e) <i>Anchoviella</i>	—	—	—	—	—	—	—
	f) <i>Thrissocles</i>	1	1	89	239	57	6	393
	g) Other clupeids	1,839	937	489	598	52	36	3,951
6.	a) <i>Harpodon nehereus</i>	3,596	769	646	1,029	858	7	6,905
	b) <i>Saurida & Saurus</i>	209	—	2	—	—	48	259
7.	<i>Hemirhamphus & Belone</i>	—	—	—	1	—	—	1
8.	Flying fish	—	—	—	—	—	—	—
9.	Perches	1,098	653	797	822	5	20	3,395
10.	Red mullets	2	—	—	—	—	—	2
11.	Poly-nemids	4	8	9	17	12	5	55
12.	Sciaenids	7,347	1,577	1,695	8,808	1,228	28	20,683
13.	Ribbon fish	1,426	762	1,122	2,651	283	—	6,244
14.	a) <i>Caranx</i>	59	7	—	24	164	2	256
	b) <i>Chorinemus</i>	82	2	2	19	—	1	106
	c) <i>Trachynotus</i>	—	—	—	—	—	—	—
	d) Other carangids	—	—	—	—	—	—	—
	e) <i>Coryphaena</i>	—	—	—	—	—	—	—
	f) <i>Elacate</i>	—	—	—	—	—	—	—
15.	a) <i>Leiognathus</i>	—	—	—	—	—	—	—
	b) <i>Gazza</i>	—	—	—	—	—	—	—
16.	<i>Lactarius</i>	4,098	942	847	1,225	—	—	7,112
17.	Pomfrets	674	393	342	1,226	1,185	139	3,959
18.	Mackerel	—	—	—	—	—	—	—
19.	Seer fish	770	363	219	204	36	—	1,592
20.	Tunnies	124	10	72	98	3	—	307
21.	<i>Sphyraena</i>	—	—	—	—	—	—	—
22.	<i>Mugil</i>	93	102	102	40	6	101	444
23.	<i>Bregmaceros</i>	3	—	—	—	—	—	3
24.	Soles	257	41	—	12	—	—	310
25.	a) Penaeid prawns	1,298	187	154	275	398	8	2,320
	b) Non-penaeid prawns	157	98	139	235	94	29	752
	c) Lobsters	232	74	65	67	28	—	466
	d) Other crustaceans	25	86	169	29	—	41	350
26.	Cephalopods	1,310	490	341	892	371	—	3,404
27.	Miscellaneous	1,961	586	1,544	3,612	2,848	75	10,626
Total		34,670	9,826	11,606	26,854	9,381	910	93,247

of cat fishes, *Hilsa ilisha*, sciaenids, *Leiognathus* and penaeid prawns, however, were comparatively poor. The month of March showed the maximum catch (Table 4).

Andhra Pradesh

The total catch in Andhra during the period January to June 1978 showed a decline of about 18,000 tonnes. A significant fall in the landings of cat fishes, lesser sardines, *Anchoviella*, sciaenids, ribbon fish, *Leiognathus*, pomfrets, penaeid prawns and non-penaeid prawns was noticed during the period. A substantial increase in the catch of mackerel, elasmobranchs, eels and polynemids was, however, recorded (Table 5). January and February had the maximum catch.

Tamil Nadu

In Tamil Nadu, the total marine fish landings showed a significant increase of about 29,500 tonnes. The successful fisheries of elasmobranchs, lesser sardines, *Hilsa* spp, *Thrissoctes*, perches, red mullets, sciaenids, ribbon fish, *Leiognathus*, pomfrets, seer fish and prawns accounted for the significant higher total landings. But the catch of crustaceans like crabs, *Sphyræna*, tunnies, mackerel, cat fishes and *Anchoviella* was comparatively poor (Table 6). February had the maximum catch and the minimum was in May.

Pondicherry

A decrease of 23 tonnes in the total landings was witnessed in Pondicherry during the first half of 1978. While the catch of *Anchoviella*, perches, sciaenids, and penaeid prawns was comparatively better, elasmobranchs, lesser sardines, *Thrissoctes*, ribbon fish, *Leiognathus* and mackerel recorded poor landings. The catch particulars for the period January to June 1978 are shown in Table 7.

Kerala

In Kerala, the total catch showed a slight increase of about 900 tonnes during January to June 1978 as compared to the corresponding period in 1977. A significant increase in the landings of mackerel, penaeid prawns, soles, elasmobranchs, cat fishes, *Anchoviella*, sciaenids, ribbon fish and pomfrets, was noticed. The catch of oil sardine, lesser sardines, perches and silver bellies, however, was comparatively poor (Table 8). The catch was maintained at fairly steady level in most of the months.

Karnataka

A substantial increase of about 19,000 tonnes in the total landings was recorded in Karnataka during the first half of 1978 as compared to the corresponding half of 1977. While the landings of oil sardine, lesser sardines, pomfrets, mackerel, and penaeid prawns were comparatively higher, cat fishes, perches, sciaenids, silver bellies and soles recorded poor landings (Table 9). January and April showed fairly high landings.

Goa

The total marine fish production in Goa showed a marginal increase of about 160 tonnes during the period January to June 1978 as compared to the corresponding period in 1977. The landings of oil sardines, lesser sardines, *Caranx* and penaeid prawns showed increasing trend. A poor fishery was noticed in respect of elasmobranchs, cat fishes, perches, sciaenids, and pomfrets. Table 10 shows the details of landings in Goa for the first half of 1978. In Goa also maximum catch was in January.

Maharashtra

In Maharashtra, the total landings declined to 102,066 tonnes from 167,487 tonnes recorded in the first half of 1977, showing a deficit of about 65,400 tonnes. The landings of *Harpodon nehereus*, penaeid prawns, non-penaeid prawns, sciaenids, pomfrets, mackerel and seer fish showed a downward trend. A substantial increase in the catch of elasmobranchs, eels, cat fishes, perches, red mullets and ribbon fish was also noticed during the period January to June 1978. The catch details are shown in Table 11. The landings show a steady increase up to May when the maximum is recorded and in June the catch was very poor.

Gujarat

In Gujarat, the total production showed an increase of about 3,300 tonnes mainly due to the successful fisheries of sciaenids, perches, seer fish, non-penaeid prawns and lobsters. The landings of cat fishes, *Chirocentrus*, *Hilsa* spp., *Harpodon nehereus*, red mullets, ribbon fish, pomfrets, penaeid prawns and other crustaceans, however, showed a declining trend. Table 12 shows the catch particulars in Gujarat for the period January to June, 1978. While the bulk of the catch was in January and April, it was very poor in June.

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MARINE PRODUCTS EXPORTS FROM INDIA

Export of marine products from India during January to June 1978

No.	Items	Quantity (In tonnes)	Value (In 1000 Rs.)	No.	Items	Quantity (In tonnes)	Value (In 1000 Rs.)
1.	Frozen shrimp	28,225	8,19,988	6.	Dried fish	2,943	13,939
2.	Frozen froglegs	1,728	36,928	7.	Shark fins	90	8,535
3.	Frozen lobster tails	408	24,437	8.	Fish maws	152	11,448
4.	Frozen fish	2,459	26,422	9.	Others	1,991	18,523
5.	Canned shrimp	147	6,764	Total		38,143	9,66,984

(Source: The Marine Products Export Development Authority, Cochin-16)



NEWS - INDIA AND OVERSEAS

Cyclone toll to fisheries sector on the east coast of India

The cyclone which hit the east coast of India in November 1977 is estimated to have destroyed nearly 3500 fishing boats and caused damages to about a thousand more in coastal Andhra Pradesh. The total loss to fishing craft and gear is estimated to amount to Rs. 25 million. The Government has released Rs. 12.8 million for repairs and replacements of craft and gear. Additional amounts are being made available.

Fishing harbour opened at Cochin

On September 5, 1978 the first stage of the Rs. 3.5 crores Cochin Fishing Harbour, the fifth in the country was commissioned by Union Shipping and Transport Minister Shri Chand Ram.

The harbour can cater to 60 deep sea fishing trawlers, 900 smaller fishing vessels, besides country craft. It has a wharf length of 360 m, a jetty of 75 m and a slipway for repair of vessels. This is the first of its kind in Kerala with modern facilities for handling the bigger trawlers. An integrated development programme of Cochin Port and the fishing harbour for Rs. 26 crores submitted by the Port Trust of Cochin is under consideration of the Union Government.

Fishing affected by epidemics in Maldives

It is reported that an epidemic of cholera and gastro-enteritis have spread to the islands of the Republic of Maldives and have brought the small country's two main industries, namely fishing and

tourism almost to a stand still. International companies have stopped buying fish from the island which form the smallest independent country in Asia, consisting of 2000 coral islands forming a chain, 764 km long and 129 km wide.

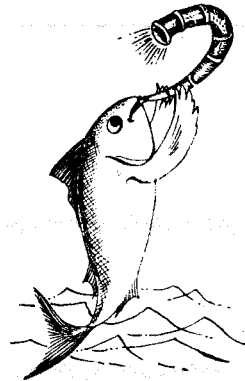
(Fishing News International 17 (6), June 1978)

Search for new fishing areas by USSR

It was disclosed by Soviet Deputy Fisheries Minister Vladimir Kamenev that the Soviet Union is planning to send expeditions to areas of the Pacific to

define potential new fishing targets. In view of the introduction of the 200 mile limit by many countries and the consequent limitations for the Soviet fishing fleet to operate in many of the traditional grounds, it has become necessary to widen the scale of fishing on the high seas and to develop deep water fishing. According to the minister the Soviet Union has concluded agreements with the USA, Canada, Japan, Norway, Sweden, Angola, Mauritania, Sierra Leone and other states to make it possible for the Soviet fleet to continue fishing within their coastal waters.

(World Fishing 27 (3): March 1978)



BOOKS

Proceedings of the Symposium on Warmwater Zooplankton Special Publication, National Institute of Oceanography, Goa, India: 722 pp, 1977.

This is a special publication containing the proceedings of the five-day symposium on warmwater zooplankton held at the National Institute of Oceanography, Goa from 14 to 19 October, 1976, sponsored by UNESCO and NIO and participated by 77 delegates from all parts of the world. 80 papers inclusive of those presented by the invited speakers and contributory papers presented in the sectional meetings organised under systematics and biogeography, ecology, energy transfer, culture, biochemistry and systems analysis and modelling are included.

Aquaculture in Southeast Asia — A historical overview. By S. W. Ling, Washington Sea Grant Publication University of Washington Press, Seattle, U. S. A. 108 pp. 1977.

The book is based on a series of lectures to the College of Fisheries, University of Washington. The various chapters describe the features of the species cultured with an outline of the more important culture methods, including a personal account of the author's work on *Macrobrachium* culture, one of the pioneering works in aquaculture.

Fishes of the World. By Joseph Nelson; John Wiley & Sons, New York: 416 pp, 1976.

It is estimated by the author that there are 18,818 living species of fish in the world, belonging to 4032 genera in 450 families.

Physiological responses of Marine Biota to pollutants. Edited by F. J. Vernberg, A Calabrese, F. P. Thurberg and W. B. Vernberg. Academic Press Inc. New York, 462 pp, 1977.

The papers presented at a symposium jointly sponsored by the Middle Atlantic Coastal Fisheries Centre, NMFS and the Belle Baruch Institute of Marine Biology and Coastal Research, University of South Carolina are included. The papers mostly reflect continuing concern about the influence of petroleum products, heavy metals, pesticides and PCBs on the physiology of marine organisms.

Recommended International standard for quick-frozen shrimps. CAC/RS 92-1976, FAO/WHO Rome, 16 pp. 1977.

This has been adopted as a world wide standard by the Codex Alimentarius Commission at its 11th session in Rome in March 1976 and prescribes standards concerning essential composition and quality factors, food additives, hygiene and handling, labelling, sampling, examination and analysis, classification of defectives and such other matters.

Proceedings of International Symposium on Reproductive Physiology of fish. Ann. Biol, anim, Bioch. Biophys., 18 (4): 759-1106, 1978.

Papers on various aspects of fish reproduction by specialists in the field of fish physiology presented at an International Symposium held at Paimpont (France) from 19 to 21 September, 1977 are published. The papers are arranged under seven main sections, namely gonadotropine hypophysaire, axe hypothalamo-hypophysaire, cytological observations on gonads, endocrinology of the sexual cycle, vitellogenesis, temperature and photoperiod effect and problems of aquaculture.

Modeling Biochemical Processes in Aquatic Ecosystems. Edited by R. P. Canale. Ann Arbor Science Publishers Inc. Ann Arbor, Michigan, U. S. A. 389 pp. 1976.

This volume includes papers written by experts in the field of modeling, limnology and environmental engineering and would be valuable to water quality administrators, planners, water resources engineers and scientists in allied fields. The application of mathematical modeling techniques to practical problems in studies like phytoplankton growth, nutrient cycling, zooplankton feeding, sediment-water interactions and various other problems in water quality management in lakes, rivers and estuaries are described.



Training course in marine prawn and fish culture

Under the programmes of the *Krishi Vigyan Kendra for Mariculture*, Narakkal, Cochin, short term course on marine prawn and fish culture has been commenced after the south west monsoon season. The course imparts training to fish farmers who either own prawn fields or employed in prawn farming operations and also to prospective farmers on various aspects of prawn and fish culture. The current course of one month duration is progressing at present. The 10th course in the series will be commencing from 3rd November, 1978. For further information the Officer-in-charge, *Krishi Vigyan Kendra* may be contacted.

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