

## STATUS OF DEMERSAL FISHERY IN SRI LANKA

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### INTRODUCTION

A proper assessment of the resources available and the methods of exploitation is very necessary for the successful implementation of a plan for the development of the fishing industry. These assessments have to be based on the scientific collection and processing of data. Although the Ministry of Fisheries compiles various forms of statistics regarding the industry, it is not possible to draw definitive conclusions from these data regarding the status of the available resources and the viability of commercial exploitation because of inadequacies in sampling, coverage, personnel, supervision, reporting, etc. However, a well designed survey to collect data and to compute of detailed statistics on fish catches on a continuing basis will provide an adequate and reliable base for a proper assessment of the potential of the fish resources around the country. An attempt has been made here to evaluate, in a rather rough manner, the status of demersal fishery in Sri Lanka. In carrying out this study information from two main sources was considered.

- Information collected through a field survey conducted at all major fish landing sites around the island simultaneously over a period of two weeks from 14 to 28 September, 1982, including interviews with fishermen, by 12 staff members from NARA and BOBP.
- The demersal fish production in various parts of the island estimated on the basis of the statistics compiled by the Ministry of Fisheries.

It is to be admitted that the field survey was of a very short duration. The extrapolated data, therefore, lead to what should be regarded only as rough estimates.

### CENSUS OF CRAFT AND FISHING METHODS

The survey covered all the major fish landing sites in the country and catch compositions and average landings were determined in relation to each type of fishing gear and craft used. All thirteen District Fishery Extension Officers' (DFEO) divisions were covered in the collection of data and categorized area-wise as follows:

- |               |    |    |                                       |
|---------------|----|----|---------------------------------------|
| 1. North-west | .. | .. | Mannar, Puttalam and Chilaw           |
| 2. West       | .. | .. | Negombo, Colombo, Mutwal              |
| 3. South-west | .. | .. | Kalutara, Beruwela                    |
| 4. South      | .. | .. | Galle, Matara                         |
| 5. South-east | .. | .. | Tangalle, Pathanagala                 |
| 6. East       | .. | .. | Batticaloa, Kalmunai                  |
| 7. North-east | .. | .. | Trincomalee, Mullaitivu               |
| 8. North      | .. | .. | Jaffna, Point Pedro and Kankasanturai |

Information on the number of fishing crafts used in demersal fishery at each centre was collected by direct observation and through information collected by DFEOs. The information on catches,

catch compositions, seasonal changes, etc., was gathered mainly through interviews with fishermen and partly by observations. The summarized data are given in Tables I and II. A study of these tables brings out the following features:

- The handline method appears to be the most widely used technique all around the island. This is because most of the local fishermen use handlining as an ancillary method with other types of gear. The usage of non-mechanized traditional crafts closely follows the pattern of the usage of handlining around the country. This may be due to the large number of local fishermen who engage in small-scale fishing. The number of boat days for handlining is comparatively higher than those for all other methods put together, except in the north.
- Among the other two types of fishing employed all around the country, bottom set gillnetting appears to be popular in the north, north-east and north-west areas, whereas bottom set longlining appears to be popular in the north-west and north followed by south.  
  
Trawling for demersal fish is limited mostly to the north and north-west coasts, since suitable shrimp trawling grounds are limited to these areas only; some trawling is conducted in the west also. Bottom set traps are in use to a very limited extent. As with trawling, this method is practically restricted to the north and north-west coasts. These are mostly operated by small-scale fishermen.
- There are relatively more non-mechanized traditional crafts in the north-east and south. There are more 3½ tonners and 18 footers in the north-west; the 3½ tonners are also more numerous in the north and west.
- Of the various types of mechanized crafts in use, the E-26 type (3½ tonner) is very common in all areas except the north-west and north where 18' FRP boats and mechanized traditional crafts are predominant. FRP boats are rarely used in the west and east coasts, where non-mechanized traditional crafts and E-26 type boats are common. Bottom set gillnets and bottom longlines are widely used by mechanized crafts whereas handlines are commonly used by non-mechanized traditional crafts.

## ANALYSIS OF FISHERY DATA

Although attempts were made to estimate for each month the average catch per boat, the number of fishing days and the catch per boat per fishing day, due to limitations of the field survey and the available fishery statistical information, it was thought that the study should be limited to the estimated data for the whole year instead of for each month. Thus the total average catch per boat for the year 1982, for each type of fishing method, was calculated and the catch rate was obtained by dividing this figure by the estimated total number of fishing days in the year. The estimated figures are given in Tables IIIa to IIIe for each district and for each type of fishing gear. The data was analysed only on the basis of gear and not according to the class of boats. The catch rate i.e., catch per boat per fishing day, does not take into account the efficiency of different types of boats employed for the same type of fishing. Thus, the data presented are only a rough guide to the general pattern of catches from different methods and their relative importance in different coastal districts.

## FISHING SEASON

**Bottom set gillnet:** The gillnet fishing is conducted throughout the year in the northern half of the island, in the coastal belt covered by Mannar, Chilaw, Negombo, Trincomalee and Jaffna. In the other areas, except in Batticaloa on the east, the fishing is generally from October to April. At Batticaloa alone, the fishery is during the other half of the year from April to September.

**Bottom set longline:** This fishery extends throughout the year at Jaffna, Mannar and Puttalam, representing the north and north-west areas, Negombo (west) and Galle (south).

Excepting Batticaloa and Mullaitivu, where the fishery extends from February/March to October, the fishing is conducted in the other areas, during October to April. This is more or less the same pattern as for bottom set gillnet operations.

**Handline fishing:** In Puttalam and Chilaw (north-west), Jaffna (north), Trincomalee (north-west), Negombo (west), Kalutara (south-west) and Kalmunai (east), handline fishing is carried out throughout the year. As in the case of bottom longline fishing, the fishing is suspended in Batticaloa and Mullaitivu during the November to January—February period while in the other areas it is suspended during May to October.

**Trap fishing:** This type of fishing is restricted only to three districts in the north, north-east and north-west parts, i.e., Jaffna, Trincomalee and Mannar, and is conducted all through the year.

**Trawling:** This is also conducted only in a few districts in the northern, north-western and western parts, almost throughout the year. But intense activity is seen only at Mannar.

In general it can be stated that the fishing activity is more or less all round the year in the northern half of the island, while at Batticaloa and Mullaitivu, the fishing is limited to April-September which is the south-west monsoon period; in the other districts, fishing is conducted during the other half of the year, October to April, which falls within the north-east monsoon period.

It is not known why bottom set longlining operations are not conducted off Trincomalee, Mutwal and Chilaw districts, whereas they are conducted in the adjacent districts. A similar question arises in respect of bottom set gillnetting in the case of Mullaitivu and Mutwal and in respect of handlining off Mutwal.

## **CATCH AND CATCH RATES**

**Bottom set gillnet (Table Iila):** The largest annual catch per boat (26 tonne) and the highest catch rate (107 kg) are obtained at Jaffna, closely followed by Chilaw (22 tonne; 100kg). Colombo has also recorded a fairly high catch rate (96 kg) but the fishing activity is restricted to one half of the year, unlike the former two districts where fishing is throughout the year. Other districts which have registered good catches are Mannar, Negombo and Kalmunai but the catch rate is around 50 kg per fishing day. On the other hand, at Galle and Batticaloa, the annual catch per boat was low but the catch rate was higher, around 80 kg.

**Bottom set longline (Table IIIb):** Pathanagala on the south-east coast has recorded the highest catch (24 tonne) and catch rate (162 kg) and has overshadowed all other districts. The next best is Jaffna with an annual catch of 20 tonne and a catch rate of 83 kg. Good catches are obtained at Negombo, Kalmunai and Galle with catch rates of 50—60 kg. At Colombo and Batticaloa, the annual catches are lower, but the catch rate is higher, 65—75 kg. The records of other areas show poor returns.

**Handline (Table IIIc):** Being an ancillary fishing method and carried out mostly by the non-mechanized traditional boats and 18 footer mechanized boats, the total annual returns and catch rate per boat are rather low, the former ranging from 500 to 4500 kg and the latter from 2 to 4 kg. The best catch rate is registered at Galle (24 kg) followed by Kalutara (19 kg). The average catch rate is 17 kg at Mannar, Chilaw, Batticaloa and Kalmunai. The poorest returns are from Pathanagala (7 kg) and Jaffna (2 kg).

**Trap fishing (Table III d) :** Indications of some prospects are seen at Trincomalee and Jaffna, although the catch rate is as low as 11 kg.

**Trawling (Table IIIe):** By far, the best annual catch and catch rate for all types of demersal fishing are recorded at Mannar with a total annual catch of about 80 tonnes and an average catch rate of 292 kg per boat. During June to December, the catch rate is as high as 500 kg and during the other months it is about 90 kg. At Jaffna, Chilaw and Mutwal, the catch rate

is very low at 21–23 kg. At these places fishing is carried out by the 3½ tonners and perhaps the prawn component sustains the operations. The non-mechanized traditional crafts employing trawl nets at Negombo show a catch rate of 7 kg only.

## ANNUAL DEMERSAL FISH PRODUCTION

The catch distribution of demersal fish production in 1982 is given in Table IV by area, district, gear and type of craft. The salient features emerging from these figures of demersal fish production are:

- Trawling accounts for the largest share (31%) of the total catch of about 40100 tonne; bottom set gillnets and handlines share equally 51% of the catch; bottom longlines come next in importance with 16%; trap fishing accounts for an insignificant 2%.
- In area-wise production, the north-west region tops with 38%, closely followed by north with 35%. In fact, the northern part of Sri Lanka, between 8°N and 10°N, so dominates that 81% of total production comes from this region.
- The 3½ tonne boats contribute nearly 60% of the total catch while the non-mechanized traditional boats and 18 footers account for 19% and 18% of the catch, respectively. One half of the contribution made by the 3½ tonners is credited to trawling, and the next largest share (29%) is from gillnetting.
- Among the top two districts, Jaffna (13900 t) and Mannar (11400 t) the latter's importance is almost exclusively due to the returns from trawling, whereas Jaffna's yield comes from diversified fishing, namely, bottom set gillnetting, bottom longlining, trawling and trap fishing in that order of importance. The returns from handlining account for the importance of Trincomalee, Chilaw and Kalmunai. Bottom longlining is the most important type of demersal fishing in Galle, supported by handlining, both largely from non-mechanized traditional crafts.

The total demersal fish production for the years 1973 to 1982 is given in Table V. The source of data, except for 1982, is the statistics prepared by the Ministry of Fisheries.

From these figures it is seen that but for an all-time low of 30,000 tonne in 1975 and a record catch of 48,000 tonne in 1981, the annual production has tended to hover around the average figure of 38,000 tonne. In the year of lowest production, the districts affected were Negombo, Puttalam, Jaffna, Trincomalee, Batticaloa and Kalmunai. Heavy catches in Jaffna and improved landings in Mannar and Puttalam contributed to the record catch in 1981.

Jaffna has always topped the district-wise production with an average of 12000 tonne. Negombo, which in 1973 shared the top place with Jaffna, has been witnessing a drastic fall in production over the years. Although there has been some recovery in 1980 and 1981, the decline has again manifested in 1982. Mannar has recently emerged as the second most important district, although practically all through the earlier years Trincomalee occupied this position.

A general declining trend is also noticed in Colombo, Kalutara, Matara and Mullaitivu. It is not known whether the changing trend is due to shifting of the bases of operation of the crafts, or due to differences in the methodology of data collection and estimation or due to some other cause.

## SPECIES COMPOSITION

The varieties caught are mainly groupers, snappers, emperors, brems (collectively called 'Rock fishes'), carangids, shark, and skates. However, the individual contributions of different varieties were not available in respect of most of the DFEO divisions. Therefore, an analysis could not be attempted. However, the demersal fish production figures given by the Ministry of Fisheries for 1981 (Table VI) would provide some idea of the contribution of various groups. The 'rock fishes' form about 36% while the others, i.e., sharks, skates and carangids, account individually for about 20% each.

**Table I**

**Estimated average number of crafts operating the specified gear per month and the estimated average number of boat days per annum**

*(Estimation of the number of boat days is based on the average number of crafts and number of fishing days; NC=Number of crafts; BD=Number of boat days)*

Gear Area	Bottom set gillnet		Bottom set longline		Handline		Fish trap		Trawling	
	NC	BD	NC	BD	NC	BD	NC	BD	NC	BD
North-west	33	16387	133	47616	357	204556	50	15000	156	43309
West	13	4380	17	5416	201	47015	—	—	<b>52</b>	<b>29220</b>
South-west	40	3462	16	1533	57	7585	—	—	—	—
South	48	3168	56	18117	202	52498	—	—	—	—
South-east	5	800	19	5450	90	27188	—	—	—	—
East	9	2235	16	4587	297	120708	—	—	—	—
North-east	107	23004	7	1334	442	173172	23	5796	—	—
North	268	64960	149	34962	445	114704	268	77152	308	91395

**Table II**

**Average number of crafts under each class (periodic sample average) in each of the areas**

Area	Craft			
	<b>3½</b> tonners	18 footers	Mechanized traditional	Non-mechanized traditional
North-West	453	982	192	194
West	324	7		220
South-West	34	29	—	<b>90</b>
South	186	43	62	431
South-East	97	13	13	72
East	55	24	—	260
North-East	25	252	20	677
North	439	139	611	201
Total	1613	1489	898	2145

**Table Iila**  
**Bottom set gillnet – Estimated average catch per boat (kg)**

Area	District	Fishing season	Annual catch	Number of fishing days	Catch per fishing day
North-West	Mannar	January—December	12040	248	49
	Puttalam	October—April	1050	35	30
	Chilaw	January—December	21600	216	100
West	Negombo	January—December	11520	216	53
	Mutwal	—	—	—	—
	Colombo	November—April	11470	120	96
South-West	Kalutara	November—April	4490	86	52
South	Galle	November—April	5480	66	83
	Matara	—	—	—	—
South-East	Tangalle	October—May	8000	160	50
	Pathanagalla	—	—	—	—
East	Batticaloa	April—September	3300	41	80
	Kalmunai	September—May	10800	216	50
North-East	Trincomalee	January—December	8400	216	39
	Mullaitivu	—	—	—	—
North	Jaffna	January—December	25790	242	107

**Table IIIb**  
**Bottom set longline—estimated average catch per boat (kg)**

Area	District	Fishing season	Annual catch	Number of fishing days	Catch per fishing day
North-West	Mannar	January—December	6480	216	30
	Puttalam	January—December	1910	141	14
	Chilaw	—	—	—	—
West	Negombo	January—December	12360	228	54
	Mutwal	—	—	—	—
	Colombo	November—March	7500	100	75
South-West	Kalutara	November—April	5640	93	61
South	Galle	January—December	10540	185	57
	Matara	October—April	2800	140	20
South—East	Tangalle	October—April	3340	140	24
	Pathanagala	November—April	24300	150	162
East	Batticaloa	March—October	4880	75	65
	Kalmunai	September—May	12200	216	56
North-East	Trincomalee	—	—	—	—
	Mullaitivu	February—October	1600	179	9
North	Jaffna	January—December	19510	234	83

**Table IIIc****Handline fishing—estimated average catch per boat (kg)**

Area	District	Fishing season	Annual catch	Number of fishing days	Catch per fishing day
North-West	Manna	October—April	2320	133	17
	Puttalam	January—December	3470	240	14
	Chilaw	January—December	3390	200	17
West	Negombo	January—December	1580	144	11
	Mutwal				
	Colombo	November—April	1390	90	15
South-West	Kalutara	January—December	2490	133	19
South	Galle	November—April	1850	78	<b>24</b>
	Matara	October—June	2110	182	12
South-East	Tangalle	October—June	1980	151	12
	Pathanagala	November—April	1000	150	<b>7</b>
East	Batticaloa	March—October	2460	146	<b>17</b>
	Kalmunai	January—December	4530	261	17
North-East	Trincomalee	January—December	2880	212	14
	Mullaitivu	February—October	2160	180	<b>12</b>
North	Jaffna	January—December	500	258	<b>2</b>

**Table hid****Trap fishing—estimated average catch per boat (kg)**

Area	District	Fishing Season	Annual Catch	Number of fishing days	Catch per fishing day
North-West	Mannar	January—December	150	300	0.5
North-East	Trincomalee	January—December	2760	252	11.0
North	Jaffna	January—December	3110	288	10.8

**Table IIIe**  
**Trawling—estimated average catch per boat (kg)**

Area	District	Fishing Season	Annual Catch	Number of fishing days	Catch per fishing day
North-West	Mannar	January—December	80490	276	292
	Chilaw	July—May	5890	276	21
West	Negombo	July—May	1890	276	7
	Mutwal	January—December	6000	288	21
North	Jaffna	January—December	6750	297	23



Table IV

36-A

## Catch distribution (in tonne) on the basis of areas, districts, crafts and type of fishing gear — 1982

MT — Mechanized traditional

NMT — Non-mechanized traditional

Fishing Gear	Bottom-set gill net					Bottom-set longline					Handline					Trap Fishing			Trawling			Grand Total
	Craft	3½ tonners	18 footers	MT	NMT	Total	3½ tonners	18 footers	MT	NMT	Total	3½ tonners	18 footers	MT	NMT	Total	MT	NMT	Total	3½ tonners	NMT	
<i>Area/District</i>																						
<i>North-West</i>																						
Mannar	170	409	120	—	699	—	130	21	39	190	—	613	—	14	627	—	8	8	9892	—	9892	11416
Puttalam	—	—	26	—	26	495	—	—	72	567	8	291	—	164	463	—	—	—	—	—	—	1056
Chilaw	—	85	—	—	86	—	—	—	—	—	1	1938	289	104	2332	—	—	—	296	—	296	2714
Total	170	495	146	—	811	495	130	21	111	757	9	2842	289	282	3422	—	8	8	10148	—	10148	15186
<i>West</i>																						
Negombo	173	—	—	—	173	272	—	—	—	272	368	—	—	40	408	—	—	—	—	183	183	1036
Mutwal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	120	—	120	120
Colombo	21	88	—	—	109	30	—	—	—	30	11	—	—	127	138	—	—	—	—	—	—	277
Total	194	88	—	—	282	302	—	—	—	302	379	—	—	167	546	—	—	—	120	183	303	1433
<i>South-West</i>																						
Kalutara	60	31	—	9	100	52	43	—	—	95	29	32	—	118	179	—	—	—	—	—	—	374
Total	60	31	—	9	100	52	43	—	—	95	29	32	—	118	179	—	—	—	—	—	—	374
<i>South</i>																						
Galle	198	22	43	—	263	392	—	219	504	1115	45	34	49	633	761	—	—	—	—	—	—	2139
Matara	—	—	—	—	—	28	—	—	—	28	125	32	—	82	239	—	—	—	—	—	—	267
Total	198	22	43	—	263	420	—	219	504	1143	170	66	49	715	1000	—	—	—	—	—	—	2406
<i>South-East</i>																						
Tangalle	40	—	—	—	40	66	—	—	—	66	148	14	14	85	261	—	—	—	—	—	—	367
Pathangala	—	—	—	—	—	360	60	23	—	443	25	4	2	1	32	—	—	—	—	—	—	475
Total	40	—	—	—	40	426	60	23	—	509	173	18	16	86	293	—	—	—	—	—	—	842
<i>East</i>																						
Batticaloa	74	19	—	—	93	7	11	—	—	18	61	—	—	518	579	—	—	—	—	—	—	690
Kalmunai	—	54	—	—	54	168	760	—	—	244	—	—	—	1610	1610	—	—	—	—	—	—	1908
Total	74	73	—	—	147	175	87	—	—	262	61	—	—	2128	2189	—	—	—	—	—	—	2598
<i>North-East</i>																						
Trincomalee	7	547	55	305	914	—	—	—	—	—	30	228	76	1801	2135	—	63	63	—	—	—	3112
Mullaitivu	—	—	—	—	—	—	11	—	—	11	—	216	—	—	216	—	—	—	—	—	—	227
Total	7	547	55	305	914	—	11	—	—	11	30	444	76	1801	2351	—	63	63	—	—	—	3339
<i>North</i>																						
Jafna	6223	609	368	409	7609	1614	1506	14	7	3141	—	1	151	70	222	246	588	834	2111	—	2111	13917
Total	6223	609	368	409	7609	1614	1506	14	7	3141	—	1	151	70	222	246	588	834	2111	—	2111	13917
Grand Total	6966	1665	612	723	10166	3484	1837	277	622	6221	851	3403	581	5367	10202	246	659	905	12419	183	12602	40095

Table V

**Total demersal fish production (1973 to 1982) (Tonne)**

	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973
Mannar	11416	5861	3913	3421	3038	3076	4657	3676	3062	3332
Puttalam	1056	4434	1974	717	2588	3465	2395	2484	3262	2082
Chilaw	2714	1169	—	—	—	—	—	—	—	—
Negombo	1036	3441	3665	1840	2560	1636	4090	4643	6722	10861
Colombo	277	716	1058	691	1095	1351	1033	661	610	398
Kalutara	374	999	1073	1495	1665	1228	1365	721	1744	936
Galle	2139	1300	1418	1945	1379	2220	2013	844	619	555
Matara	267	1259	1929	1639	2098	2122	2244	1478	889	1004
Tangalle	367	938	993	—	—	—	—	—	—	—
Hambantota	—	—	—	1001	670	1143	2069	961	1373	1097
Batticaloa	690	893	2060	755	1609	1460	1028	960	794	3637
Kalmunai	1908	1220	1310	1793	1091	1628	1634	726	764	704
Trincomalee	3112	6308	6630	6079	5601	4521	4093	2157	3514	3277
Mullaitivu	227	1148	1749	3487	1279	1800	1731	998	1594	416
Jaffna	13917	18359	11368	14172	13226	9421	7236	9893	11997	10784
Total	40095*	48045	39140	39035	37999	35071	34593	30202	36945	39083

\* Includes the catch at Mutwal (120 t) and Pathanagala (475 t).

**Table VI**  
**Group-wise demersal fish production in 1981 (Tonne)**

Districts	Sharks	Skates	Rock fishes	Carangids	Total
Mannar	1137	2716	1303	705	5861
Puttalam	620	1381	1496	937	4434
Chilaw	42	228	781	118	1169
Negombo	2106	556	481	298	3441
Colombo	2	1	263	450	716
Kalutara	140	95	490	274	999
Galle	63	20	672	545	1300
Matara	264	48	594	353	1259
Tangalle	232	262	356	88	938
Batticaloa	404	129	294	66	893
Kalmunai	377	174	379	290	1220
Trincomalee	1182	754	2563	1809	6308
Mullaitivu	168	10	857	113	1148
Jaffna	2902	4624	6717	4116	18359
Total	9639	10998	17246	10162	48045