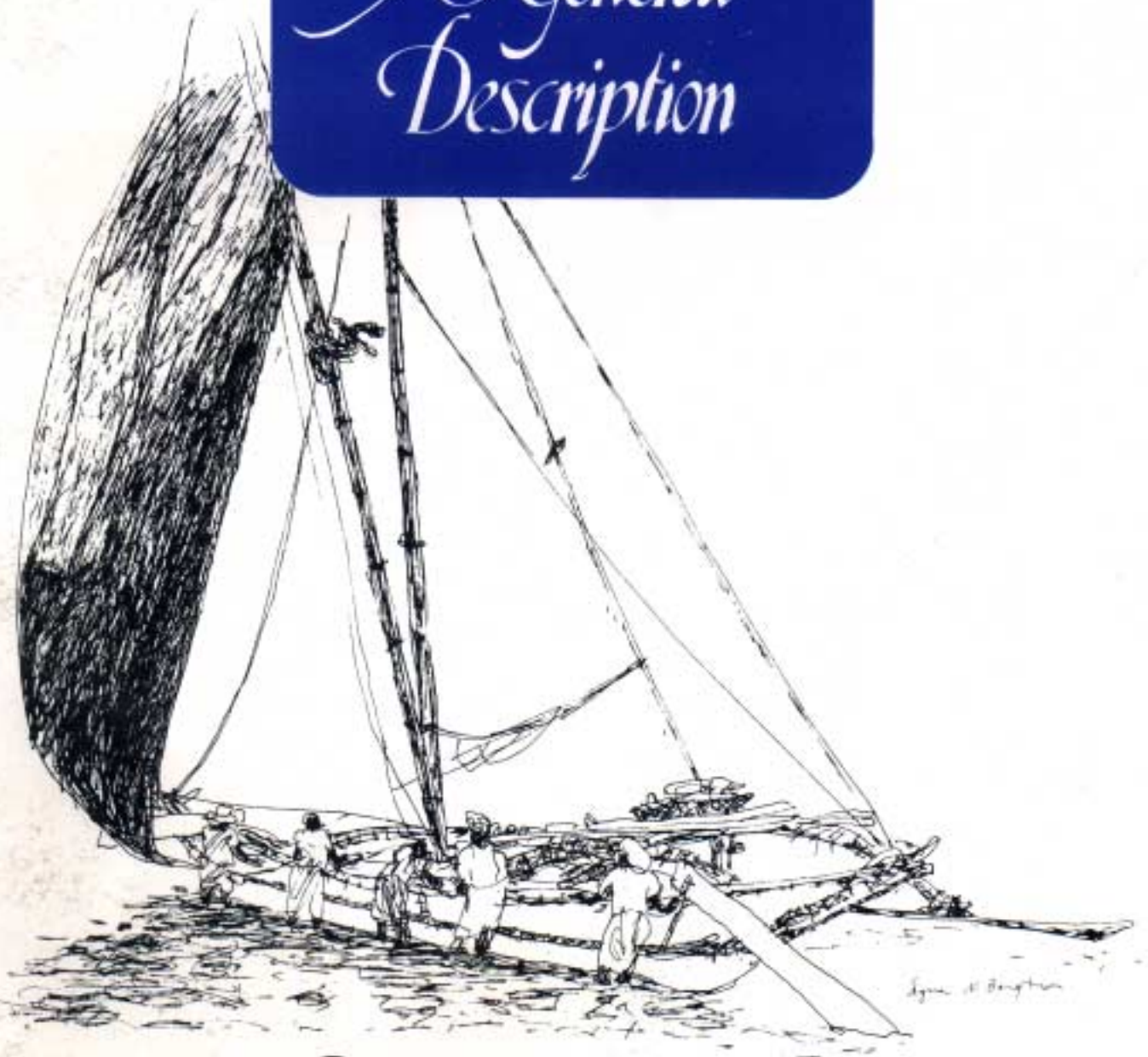
Marine Small-Scale Fisheries of Sri Lanka: A General Description



BAY OF BENGAL PROGRAMME
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MARINE SMALL-SCALE FISHERIES OF SRI LANKA: A GENERAL DESCRIPTION

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This paper attempts a brief and factual presentation of data and baseline information on the main features of the small-scale marine fisheries of Sri Lanka.

It could serve as an introduction to the subject leading to deeper studies of particular aspects; as a source of general information; or, more particularly, as a background document for use in discussions on the planning and programming of development assistance.

The paper has been prepared by the small-scale fisheries project of the Bay of Bengal Programme (BOBP). It revises and updates a document with the same title, issued in June 1977 by the FAO/UNDP project, Development of Small-Scale Fisheries in Southwest Asia, RAS/74/031, which was prepared jointly by the Sri Lanka Ministry of Fisheries and the project. Some assistance for the present revision was provided by a national consultant, Mr. V. A. Fernando.

The small-scale fisheries project of the Bay of Bengal Programme began 1979 from Madras. It covers five countries bordering the Bay of Bengal-Bangladesh, India, Malaysia, Sri Lanka and Thailand. The project's main aims are to develop, demonstrate and promote appropriate methodologies and technologies to improve the conditions of small-scale fisherfolk and increase the supply of fish from the small-scale sector in member-countries.

The document is a working paper and has not been officially cleared by the Government concerned or by the FAO.

Cover: Oru coming in after fishing-Negombo. Sketch by Signar N. Bengtson.

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1. INTRODUCTION

Sri Lanka is situated in the Bay of Bengal, south-east of India. The island has an area of approximately 65,000 km^2 and a population of about 15 million people. (See Appendix 1.1 for a map, Appendix 1.2 for a map showing the exclusive economic zone and maritime boundary, and Appendix 1.3 for some socio-economic indicators.)

All fishing in Sri Lanka, with the exception of operations carried out by a few private sector firms, consists of small-scale fishing activities.

The fishing industry contributes less than 2% to the country's gross domestic product. The principal role of the fishing industry is as a provider of food -fish is the main source of animal protein in the diet. The small-scale fishery is also an important source of employment, fulfilling a useful social function in providing work in rural areas. About 90,000 persons are engaged in fishing and ancillary activities. Exports of high-value fish products like shrimp, lobster and beche-de-mer are becoming an increasingly important source of foreign exchange.

The private sector plays a dominant role in the production, marketing and distribution of fish. Most fishing vessels are privately owned. The construction of boats, the supply of engines, spares, fishing gear and requisites are also private-sector operations with limited involvement by the state. The efforts of the private sector are regulated by state-sector intervention in distribution and price stabilisation (through the Ceylon Fisheries Corporation) and the provision of infrastructure (through the Ceylon Fishery Harbours Corporation).

Statistics of fair reliability in respect of the fisheries are available from 1952. The total production was then in the order of 25,000 t[1] The bulk of the catch was produced by the beach-seine fishery and the indigenous craft fishery in about equal quantities. The other sectors, i.e., deep-sea and inland fisheries, contributed only about 3% *to* the total production. More than half the production was consumed in dried form. The wet fish equivalent of imported dried fish was four times as high as the local production, i.e., about 100,000 t.

During the following six years, 1952-58, the total production increased to about 40,000 t, but there was no significant change in the fisheries situation. The only change worth noting was a somewhat lower proportion of dried fish, i.e., less than 40% of the total. This decrease was, on the other hand, compensated by an increased import of dried fish amounting to a wet fish equivalent of 120,000 t.

The efforts to motorize the traditional fleet were intensified during this period. Experiments had been undertaken long before, as early as 1937, but it was in the 1950s that motorization was firmly established with about 100 motorized boats by 1958.

The period **1958-65** was characterized by the motorization of small indigenous craft and the introduction of a small motorized fibre-glass boat; the introduction of a 3½ ton plank-built motorized boat; and the introduction of nylon nets. In this period the production more than doubled and reached 85,000 t in 1965.

About half the catch was produced by non-motorized traditional craft; the relatively high share for this fishery was probably because of the nylon nets. The other half was equally divided between beach seining, motorized traditional craft, and new 3½ ton boats. (Inland fisheries produced about 8.5% of the total production.)

The local production of dried fish was at about the same level as in 1952 and 1958 (4,500 t) and the import of dried fish was at the same high level as in 1958, i.e. 120,000 t (3-year average) wet fish equivalent. The remarkable production increase was thus absorbed by the fresh-fish market.

[1] t -tonnes. All references to 't' in this report are to tonnes.

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A slowing down in the rate of motorization and issue of 3½ ton boats marked the end of this period; furthermore, the first 3½ ton boats issued in 1958/59 started to go out of service.

Greater interest was shown in the development of deep-sea fisheries at this time and the Ceylon Fisheries Corporation (CFC) was established.

The period 1965-77 saw a much slower rate of development and, with reservation for some errors in the statistics, the production increase was about 31,000 t.

The reasons were : a net decrease in operational 3½ ton boats due to an inadequate replacement programme (until 1972) ; shortage of fishing nets and spare parts for engines due to import restrictions; and failure of the attempts at dep-sea fishery development due to lack of capital and skills.

One-third of the production during this period came from the 3½ ton boats and the balance from indigenous craft and other small craft. The deep-sea fishery still produced only a small fraction of the total (0.4%). The production of dried fish remained at the same level.

The imports were lower than in the previous period, were drastically reduced after 1972, and amounted to about 9,000 t wet fish equivalent in 1977.

Institutionally, this period saw the establishment of the Ceylon Fishery Harbours Corporation (CFHC), a separate Ministry of Fisheries, a fisheries training institute, a fish technology institute and 3 fisheries training centres. The field organisation of the fisheries department was reorganized by the establishment of district fisheries extension offices. An attempt was made to channel industry inputs through the medium of fishery cooperatives.

This period also saw the construction of several fishery harbours. At the end of the period, development efforts were being concentrated on replacement of 3½ tonners, continued motorization of traditional and other small craft and on upgrading of the coastal fisheries for more intensive exploitation of the pelagic resources in the offshore waters beyond 20 km from the coast.

The period 1977-1983 has been one of accelerated development. The production increase upto 1981 was about 50,000 t with an annual increase of 6-10%.

The reasons are a rapid influx of new boats and the fact that fishing gear, engine spares and replacement engines became freely available due to the removal of import restrictions, and, in the case of fishing gear, due also to increased local production.

Nearly 70% of the production from the coastal fishery in 1981 came from mechanized craft The deep-sea and offshore fisheries continued to yield only a fraction of the total marine production (1.2%).

There have been wide fluctuations in fish imports with a maximum import of about 34,000 t wet fish equivalent in 1980. In 1981 imports amounted to only 10,700 t wet fish equivalent.

Knowledge of the fish resources in the coastal waters has improved as a result of three surveys conducted by the RV Dr Fridtjof Nansen. The annual sustainable yield has been estimated at about 250,000 t.

The fisheries administrative set-up was reorganized with an integrated Ministry of Fisheries into which the fisheries department was absorbed. A National Aquatic Resources Agency (NARA) has been established and handles research and some aspects of development.

Development efforts are now being concentrated on identifying fuel-efficient alternatives to the earlier generation of mechanised craft for introduction into the coastal fishery; development and more intensive exploitation of the inland fisheries; exploitation of the offshore resources by the introduction of larger vessels; improvement of infrastructure for marketing and distribution; and improvement of the living standards of the fisherfolk.

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2. RESOURCES

The continental shelf is generally rocky, particularly between Colombo and Batticaloa. However, sand occurs even in the rocky areas. The northern part, particularly the Palk Bay area, is predominantly muddy or muddy-sandy. From Puttalam to Colombo, the shelf has extensive trawlable bottom but the south-west part has a rough and uneven bottom. The Hambantota area has a limited trawlable bottom. In the east, there is smooth bottom only in the inshore area south of Trincomalee but north of it the bottom is very suitable for trawling. The slope begins abruptly in most areas except in the Palk Bay, Gulf of Mannar and Pedro Bank areas. The shelf widens gradually south of Puttalam and narrows on the east coast. (See Appendix 2.1 for a map showing the bottom characteristics of the continental shelf.)

The climate is affected by the country's insularity, proximity to the equator and the Indian Ocean. The rains are determined by monsoons — the SW monsoon from May to September and the NE monsoon from November to March. During the SW monsoon, humid monsoon winds blocked by the mountain ranges in central and southern Sri Lanka, produce heavy rains in the southwestern part of the country while the NE monsoon, which is weaker and shorter-lived than the SW monsoon, brings rain to the northern and eastern parts of the country. Inter-monsoonal periods of short duration are marked by little wind and high humidity.

The large-scale oceanic currents related to regional oceanic circulation which dominate waters beyond the continental shelf are controlled by winds and temperature differences and their general pattern changes seasonally. Off the east coast, currents are strongest during the north-east monsoon when they show an easterly trend while off the west coast they are strongest during the southwest monsoon and exhibit a westerly trend.

In general, the coastal currents off the east coast are stronger than those off the west coast. Those off the southern coast are among the strongest with velocities of around 1 m/sec.

The seas around Sri Lanka are micro-tidal and are predominantly semidiurnal. The rise and fall of tide is within 0.7 m at springs and 0.05 m at neaps. The highest tidal range is generally around Colombo and is least around Delft and Trincomalee.

Due to the low tidal range, there is little change in the level of water in most river mouths, leading to the formation of sand and mud banks blocking the entrances to rivers.

About 215 demersal species belonging to 55 families are represented in the catches by a variety of fishing gear but only about 8 varieties are most common or predominant (> 10%) — Lethrindae (emperor fishes), Lutjanidae (snappers), Carangidae (jacks and trevallys), Serranidae (groupers), Pomadasyidae (grunts/sweet lips), Leiognathidae (pony fishes), Acanthuridae (surgeon fishes) and the cartilaginous fishes — Carcharinidae (requiem sharks), Myliobatidae (eagle rays), Rhinobatidae (guitar fishes) and Dasyatidae (sting rays).

The smaller short-lived species such as pony fishes predominate in the north and northwest while the larger longer-lived species such as snappers, emperors, groupers, sharks and rays are predominant in the other areas of the continental shelf. Resources surveys and exploratory fishing activities have indicated significant changes in species composition in accordance with differences in bottom conditions and that the 20-60 m depth range is the most productive belt for demersals. The demersal trawl catch rates in the northwest and north are higher than in other areas. Appendix 2.2 indicates the mean catch rates by small trawlers.

The RV Dr Fridtjof Nansen carried out acoustic surveys of the fish resources around Sri Lanka (1978-1980). It was estimated that the potential yield of demersal fish from the continental shelf area is about 80,000 t/annum (10,000 t from the shallow Palk Bay/Palk Strait area in the north and 70,000 t from the rest of the continental shelf). This estimate was later revised to about 75,000 t (30,000 t from the Palk Bay/Palk Strait area and 45,000 t from the rest of the

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shelf). The major component of the demersal stock in the Palk Bay and Palk Strait area is small fish such as pony fishes. Considering the levels of production of demersal species in the various districts, the potential yield available for further increase in production is about 37,000 t/annum for all types of demersal fish and about 14,000 t of valuable large varieties. Only about 3,500 t of the latter may be found in the northern area. Of the 40,000 t of demersal fish produced annually, nearly 77% is from the north and northwest coasts.

A study of the available information on demersal resources was carried out recently (1982) by the Bay of Bengal Programme in which data from all past surveys were reanalyzed and assessed. Table 2.1 gives estimates of yields for demersal species made on the basis of this study.

Table 2.1

Maximum sustainable yield and potential yield of demersal species

(In tonnes)

Area	Maximum sustainable yield of valuable species	Maximum sustainable yield of all demersals	Potential yield of all demersals	Potential yield of valuable large demersals
Mannar — Negombo	6924	11264	6500	2100
Negombo — Matara	9127	17064	14285	6300
Matara — Pattanangala	3347	6222	5500	2700
Pattanangala — Trinca	2608	5350	5000	2400
Trinco — Mullaitivu	2503	3356	240	0
Mullaitivu — Pedro Bank	978	1713	1400	690
Pt. Pedro — Mannar	3429	29815	4200	0
Total	28916	74784	37125	14190

The demersal fish beyond the continental shelf are predominantly small species which are uncommon in the shelf area and have presently no demand as food fish. Unexploited deep water shrimps and lobsters also exist in the 200-350 m depth ranges off the northwest and northeast coasts but it is not certain whether these stocks can support a commercially viable fishery.

Small pelagic species such as sardines, herrings, anchovies and mackerels represented by ***Sardinella*** spp., ***Harengula*** spp., ***Anchoviella*** spp., ***Decapterus*** spp. and ***Rastrelliger kanagorta*** in the inshore waters are exploited primarily by beach-seines and small-mesh gillnets. With the increasing effort through gillnets, the beach-seine fishery is declining over the years -from a contribution of 30-40,000 t/annum in the early 70s to about 8-10,000 t/annum at present. Trials conducted have failed to show heavy concentration and commercial viability of exploiting small pelagic species in the offshore ranges around Sri Lanka.

The RV Dr Fridtjof Nansen survey indicated that the potential yield from small pelagic species could be in the region of 170,000 t/annum which includes a mixture of numerous species besides those mentioned above. Some of them are not readily taken by existing methods of fishing and may not be in sufficient concentrations to make the introduction of new techniques a viable proposition. Assessments made in respect of these species are insufficient to determine the possible degree of expansion.

Large pelagic fishes such as tunas, tuna-like fishes, king mackerels, bill fishes and pelagic sharks contribute about 30,000 t/annum to the annual total production. The exploitation of

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these species around Sri Lanka is presently linked to the area within and up to a little beyond the edge of the continental shelf. The tunas, bill fishes and pelagic sharks are primarily oceanic species and are predominant well beyond the continental shelf and only the tuna-like species such as eastern little tuna, frigate tuna, and king mackerels tend to be concentrated in the shelf area.

Considering the species composition in the production of large pelagics, a significant increase in production of these varieties may be possible only by extending the fishery beyond the presently exploited range, well into the offshore ranges of the EEZ. This may help to increase the production by at least 20,000 t-skipjack 15,000 t, yellowfin (young) 1,000 t, yellowfin and bigeye (old) 2,000 t, billfishes 500 t and others (mainly sharks) 1,500 t — provided the economic viability of the fishing operations can be established. One encouraging feature is that there is a declining trend in the tuna fishing effort by foreign nations such as Japan, Korea and Taiwan in this part of the Indian Ocean -due to economic reasons and the new legal regime of the oceans.

Other commercially important resources consist mainly of prawns, lobsters, crabs, squids, cuttlefish, beche-de-mer, oysters and chanks.

There are about 33 species of prawns but only about eight of them *(P. indicus, P. semisulcatus, P. monodon, P. merguiensus, P. stylifera, Metapenaeus* spp,) contribute significantly to the resource. About 5,000 t is exploited at present but potential yield is unknown. The catch trends do not show possibilities of substantial increase in production. The main concentrations are in the mud banks of the Palk Bay area, between Colombo and Udappu, off Mullaitivu and in Batticaloa.

About five species of lobsters are present around Sri Lanka and they contribute about 200-600 t/annum. This variety is found in coral banks, sandstone, rocks and even mud banks up to 25 m depth.

Beche-de-mer (sea cucumber) is found primarily in the muddy bottom off the shores of the northwest coast of Sri Lanka (Palk Bay, Gulf of Mannar and Kalpitiya). The main species is *Holothuria scabra* found in the 6-20 m depth range. Production is estimated to be about 100-150 t/annum. There is no information on the potential yield.

Oysters consist of edible oysters, window-pane oysters and pearl oysters. Little is known about the production and potential of the first variety; the second variety contributed to an important industry in the past, the main resource being present in Tamblegam Bay (Trincomalee). The pearl oysters are abundant in the pearl banks off the NW coast and contributed to a major fishery until about 25 years ago. In 1958,4.5 million pearl oysters were fished out from a stock of about 258 million oysters and in 1983, 20-30,000 oysters were collected by divers.

About 100 t of chanks are collected and exported annually from the Palk Bay area. Little is known about their potential yield.

The main production of squids and cuttlefish comes from the prawn grounds as incidental catch. There is no major fishery for these species of which the present production is around, 1,000 t/annum.

Two crab species of commercial value exist and the present production is in the region of 1,500 t/annum.

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3. FISHING FLEET

3.1 Fishing craft

The fishing fleet consists of about 27,000 craft. These include over 5,000 craft fishing in lagoons or seasonally in both sea and lagoons. There are about 13,000 (48%) motorized craft of both introduced and indigenous types. The present composition of the fishing fleet is given in Table 3.1.

Table 3.1

Composition of the fishing fleet

Type	Motorized	Non-motorized
1. Indigenous craft		
1 .1 Outrigger canoes	1338	6260
1.2 Log-rafts	2075	3342
1.3 Beach-seine craft	—	1278
1.4 Other planked and dugout craft	378	3083
2. Introduced craft		
2.1 3½ ton boats	**3329**	—
2.2 5.3-5.7 m FRP boats	5882	—
2.3 11.6 m 'ADB project boats'	30	—
2.4 10.4 m 'Abu Dhabi project boats'	8	—
2.5 Trawlers (236 GT)	4	—
2.6 13-1 4 m ferro-cement trawlers	2	—
Total	13046	13963

Except for the few larger vessel; which fish in offshore waters (2.3-2.6 in Table 3.1) -the 236 GT trawlers owned by the Ceylon Fisheries Corporation, the 13-14 m ferro-cement trawlers owned by the Cey- Nor Development Foundation, the 11.6 m driftnetters introduced under the Asian Development Bank-Financed Southwest Coast Fisheries Project and **the** 10.4 m driftnetters introduced under the Abu Dhabi Fund-financed Northwest Coast Fisheries Project which are owned and operated by fishing companies and cooperatives-all other craft belong to the small-scale sector and operate in the coastal fishery which in Sri Lanka is considered to extend to an area of the sea up to about 40 km from the coast.

The fishing craft of the small-scale sector are of the following types:

Indigenous craft

(i) ***Planked beach-seine craft*** (Padahu, Pathai, Paru)

These are beamy planked flat-bottomed boats with a length overall of up to 12 m. The craft are used for carrying beach seines out to sea for a distance of half to one mile for setting the net.

(ii) ***Other planked craft*** (Vallam)

These are narrow V-shaped sailing craft constructed with keel and frames with an overall length up to about 10 m. They are used for driftnetting, longlining and set-net fishing. A small number of these craft have been motorized with inboard engines.

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(iii) ***Dugout beach-seine craft*** (Madel oru, Karavalai Vallam)

These craft are similar to the outrigger canoes described below (iv) except that they are propelled by oars and in the case of the Karavalai Vallam may have an overall length of up to 12 m.

(iv) ***Outrigger canoes*** (Oru, Kulla, Thony)

These are dugouts and are driven by oars and/or sail. The craft have narrow dugout hulls raised with side sttakes attached to the dugout bases, with sharply raised hull ends and an outrigger consisting of a solid counterpoise float attached to a pair of reinforced curved booms. In some parts of the east coast, the raised side strakes are not attached to the hulls. The sizes range from about 3 m used for bait fishing, cast-netting or angling close inshore or in lagoons, to the larger 10-11 m craft used for prawn fishing with trawls and for trolling, hand-lining and drift-net fishing upto 30 km from the coast. About 17% of these craft have been motorized with outboards.

(v) Dugouts without outrigger or raised side strakes (Vallam)

These are propelled by oar or sail and range from 3 m to 6 m. This type of vallam is generally used close inshore or in lagoons for cast-netting as well as for the operation of small-mesh drift nets.

(vi) Log ***rafts*** (Kattumaram, Theppam)

These are made of four or five roughly shaped logs pegged and/or tied together. They are mainly used for small-mesh gillnetting. In some areas (west coast) a bag-like drag net is dragged by two log rafts for catching of prawns. In the kattumaram (4-7 m) the two middle logs jut out beyond the outer logs fore and aft. A small roughly shaped prow piece made of two logs is attached to the fore end of the middle logs.

In the theppam (3-5 m) all logs are of almost equal size with a slight shaping fore and aft. Nearly 40% of the log rafts have been successfully motorized with outboards.

Introduced craft

(i) ***FRP boats (5.3-5.7*** m)

These are undecked, open boats made of glass fibre reinforced plastic. They are mainly used for small-mesh gillnetting. In a few areas, such as Nagombo, some of them also operate large-mesh gillnets. Most of the boats have planing hulls adapted from a pleasure boat design, while a smaller number have a displacement type hull based on a Norwegian life-boat design. They are propelled by petrol or kerosene outboard engines (6-15 hp).

(ii) 3½ ton ***boats***

The majority of these boats are of the E 26 design and have a length of about 8.5 m, a beam of about 2.5 m and a displacement loaded for fishing of 3.5 t. Most of them are constructed in wood but an adapted version of the E 26 is built in FRP in large numbers. They are powered by inboard marine diesel engines of 30-40 hp. The boat is mainly used for large-mesh gillnetting, but in some areas also for long-lining and pole and line fishing. In Jaffna, Mannar, Chilaw, Negombo and Colombo about 1,200 of these craft are seasonally engaged in prawn trawling.

The "Jaffna type" boat used in the north is also generally classified as a 3½ ton boat. It is an adaptation of the traditional planked vallam of the north into a more modern form suitable for motorizing with an inboard engine. Most of these boats have a length of about 9.7 m.

The distribution of the main categories of fishing craft according to District Fisheries Extension Officer's divisions, which approximate to the coastal districts, as at the end of 1981 is shown in Appendix 3.1.

3.2 Fishing gear

The most important fishing gear is the drift/gillnet. The beach seine (madel, karavalai) has declined in importance but is still extensively used seasonally in some areas. A large number of

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cast nets (visidel, veechuvalai) are operated particularly in the lagoons and are used mainly without craft but also in some cases from small craft. Other gear traditionally used have **been** trolling lines, handlines and pole and line with live bait mainly in the south and stake nets (Siraguvalai) in the north. Tuna longlining is used by some 3½ t boats as a supplementary gear to drift/gillnets. Recently some boats in Negombo have taken up bottom longlining during the 'off' season for drift gillnets. A significant change during the last few years has been the steady increase of seasonal shrimp trawling **by 3½** ton boats in the Palk Bay and Gulf of Mannar.

No quantitative information in regard to fishing gear later than that from the fisheries census of 1972 is available. The census listed 23,000 fishing management units. Table 3.2 shows the extent of use of different types of gear at that time.

Table 3.2

Major types of gear used by fishing management units (1972)

Type of Fishing Gear	No. of Fishing Management Units	Percentage
1 . Gillnet	9,648	**42.0**
2. Cast net	**5,700**	**24.8**
3. Hook and line	**2,506**	**10.9**
4. Stationary gear	**2,371**	**10.3**
5. Seine net	**1,658**	**7.2**
6. Manual shrimp drag net	**504**	**2.2**
7. Trawl	**75**	**0.3**
8. Others	**538**	**2.3**
Total	**23,000**	**100.0**

Table 3.3 shows the relation between small-mesh and large-mesh gillnetting.

Table 3.3

Fishing management units using gillnets as the major type of gear (1972)

Mesh size	**No. of** management units	Percentage
Less than 3"	**7,254**	**75.2**
3½"-6"	1,962	**20.3**
6" and over	**432**	**4.5**
Total	9,648	100.0

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4. INFRASTRUCTURE AND SERVICE FACILITIES

There are about 970 fishing villages around the coast, each comprising one or more fish landing centres. Many of these centres consist merely of unprotected sandy beaches without any shore facilities and are not operational during the monsoons. Fishing craft are generally beached or anchored outside the surf zone at these centres. In some areas naturally protected anchorages, are available in lagoons, e.g. Negombo, Jaffna, Chilaw, Puttalam, Batticaloa.

Fishery harbours for small craft providing protected anchorage and some shore facilities are located at Beruwela, Mirissa, Tangalle, Myliddy and are under construction at Valachchenai Devinuwara and Mannar. Another such harbour is planned at Kirinda. Fishery harbours which can accommodate deep-sea fishing vessels are located at Colombo (Mutwal), Galle and Trincomalee, but their rate of utilization is low as no deep-sea vessels are operational and they are mainly used by a few offshore fishing vessels. The facilities and services at the existing fishery harbours are given in Appendix 4.1.

There are 67 ice-making plants, with a total capacity of 630 t/day. Of these, 23 plants with a capacity of about 190 t/day are owned by the state. 26 plants with a capacity of about 400 t/day are located in the Colombo, Gampaha and Puttalam districts on the west coast. A classification of the plants by capacity is given in Table 4.1.

Table 4.1

Capacities of ice-making plants

Capacity (t/day)	Number	Total capacity (t/day)	Percentage
Under 5	14	40.35	6
5- 9	28	146.90	23
1 O-24	19	212.20	34
25-49	1	25.00	4
50and over	5	206.00	33
Total	67	630.45	100

Freezing and cold storage facilities are used by exporters for the processing and storage of shrimp, lobster and squid **by** the Ceylon Fisheries Corporation (CFC) for their normal fish marketing activities and to maintain buffer stocks for the purpose of stabilizing prices; and by private fish traders at times of glut.

There are 16 freezing plants with a total capacity of 47 t/day. Of these, four state-owned plants with a capacity of 40 t/day are located in Beruwela, Galle and Trincomalee fishery harbours. Of the remainder, 11 plants with a capacity of 5.5 t/day are located in Colombo while two small plants are located in Jaffna and Batticaloa.

The bulk of the cold storage is located in the Galle fishery harbour (2,400 t) and in Colombo (2,000 t). The remainder is located in two fishing centres on the west coast, Negombo (50 t) and Beruwela (200 t) ; one centre on the northwest coast, Pesalai (100 t) ; and two centres on the east **coast,** Batticaloa (125 t) and Trincomalee (200t).

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Construction of fishing boats as an industry commenced in 1958 with the establishment of boatyards for construction of 3½ ton timber boats for the mechanization programme. Indigenous boats are traditionally constructed on site or in backyards by itinerant carpenters.

There are 64 boatyards registered with the Ministry of Fisheries. Most of them are located in Negombo (30) and Colombo (14). The others are scattered in Jaffna, Galle, Matara, Puttalam and Mullaitivu districts. In recent times, a large number of boatyards have been established for construction in FRP and there are 21 yards constructing exclusively in this material. Of the rest, the majority construct in timber with a few constructing a mix of timber and FRP boats.

Most of the boatyards are small-scale, private-sector, proprietorial enterprises operating with very limited capital. A few are owned by private-sector companies, one by the Ceylon Fishery Harbours Corporation and one by the Cey-Nor Development Foundation.

There are four fishing net factories. Their locations, ownership and production capacities are shown in Table 4.2. The present level of production of these factories is however only 40% of their total rated capacity.

Table 4.2

Fishing net factories

Location	Owned by	Annual capacity to produce nets of mesh size		
		Under 4" (t)	4" & over (t)	Total (t)
Wellampitiya (Colombo)	J.B. Fishing Industries Ltd.	**8**	**90**	**98**
Lunuwila (Wennappuwa)	Cey-Nor Foundation Ltd.	**55**	**69**	**124**
Polgahamulla (Matara)	-do-	**55**	**202**	**257**
Gurunagar (Jaffna)	-do-	**37**	**67**	**104**
Total		**155**	**428**	**583**

Engine repair and maintenance is carried out mainly by itinerant mechanics or by motor garages in outstation areas. In Colombo, workshops are operated by most of the local agents for the various makes of inboard and outboard engines.

The districtwise distribution of the fishery harbours, ice plants, freezing and cold storage facilities, boatyards and fishing net factories is shown in the map in Appendix 4.2.

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5. PRODUCTION

The major portion of the marine fish production comes from the coastal fishery. The offshore and deep-sea fisheries presently contribute less than 1.5% to the total catch. Table 5.1 shows the respective contributions of these segments to the marine fish production and the increase in production from the coastal fishery during the last four years.

Table 5.1

Marine fish production (1977-81)

In tonnes

Year	Offshore and deep-sea fishery	Coastal fishery	Total	Percentage increase in the coastal fishery production
1977 . .	304	123,411	123,715	—
1978 . .	2903	134,744	137,647	9.2
1979 . .	2066	146,507	148,573	8.7
1980 . .	2114	162,661	164,775	11.0
1981 , .	2144	172,318	174,462	5.9

For purposes of production statistics, the catch is broken down into nine groups of species. These groups and the main species included in the groups are shown in Appendix 5.1. The species composition of the marine fish landings in terms of these groups of species is shown in Appendix 5.2.

The major portion of the catch from the coastal fishery is landed by mechanized craft. Their landings show an upward trend. The landings of the coastal fishery during 1977-81 by different types of craft are shown in Table 5.2. The composition of the landings by different types of craft in 1981 is given in Appendix 5.3.

Table 5.2

Production in the coastal fishery by type of craft (1977-81)

In tonnes

Year	Total production	Production by mechanized craft		Production by non-mechanized craft	Production by mechanized craft as percentage of total production
		Inboard mechanized 3½ ton	Outboard mechanized		
1977	123,411	43,149	39,487	40,775	67
1978	134,744	49,081	38,124	47,539	65
1979	146,507	49,612	43,159	53,738	63
1980	162,661	52,962	56,526	53,173	67
1981	172,318	55,564	64,480	52,274	70

The seasonal production pattern in terms of the monthly average catches during 1977-81 is shown in Appendix 5.4.

The major fish producing districts are Jaffna, Gampaha, Puttalam, Trincomalee, and Mannar, accounting for 60% of the coastal fishery production in 1981. The district-wise landings in 1981 are shown in Appendix 5.5.

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6. FISH HANDLING AND PROCESSING

The boats operating in the coastal fishery make one-day fishing trips and do not carry ice on board. The larger 10.4 and 11.6 m ADB and Abu Dhabi project boats are equipped with ice holds for undertaking longer fishing trips, but recent experience with these boats indicates that these boats also often make one-day trips and on such occasions do not carry ice.

Fish is not generally iced immediately after landing nor is ice used for fish consumed in the vicinity of landing centres. Fish transported over longer distances from producing areas to consuming areas is packed with ice in wooden boxes with capacity to hold 23 to 27 kg. Icing is generally done twice, first at the time of packing and again at the time of loading for transport. Fish is rarely iced on arrival at consuming points.

Fish is mainly transported in uninsulated trucks. A few insulated vans provided under the first Asian Development Bank project are used in the south. Small quantities of fish are also transported by rail from the Jaffna, Mannar and Batticaloa districts. Some refrigerated trucks are used by exporters for transport of shrimp, squid, etc.

About 85% of the domestic production of marine fish is consumed in the fresh form, about 10% is dried and about 2% frozen. The quantity reduced into fish meal and fish oil is negligible. The utilization of the landings in 1981 is shown in Table 6.1.

Table 6.1

Utilization of marine fish landings (1981)

Manner of utilization	1981	
	Qty. (t)	%
Fresh form	148,815	85.30
Dried/Cured	20,882	11.97
Frozen	4,231	2.42
Reduction	534	0.31
Total	174,462	100.00

Fish is sun-dried, with or without salt, on the beaches and in backyards often under poor hygienic conditions. Fish that are dried are mainly caranx, sharks, skates, rock fish and some small species of the 'shore seine varieties'. The dried fish producing districts are Jaffna (63%). Puttalam (14%), Mannar (12%) and the East Coast districts (11%). Reduction of fish into fish oil is solely dsne by the CFC. while fish meal is produced by CFC, and a few private-sector entrepreneurs.

Except at times when there is a glut of fish, freezing is generally confined to shrimp, lobster and squid destined for export markets.

Beche-de-mer, which is not included in the marine fish production statistics, is landed and processed in the Jaffna, Mannar and Puttalam districts. There is no local market for this product which is entirely exported. About 70 t of processed beche-de-mer was produced in 1981.

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7. DISTRIBUTION AND MARKETING

The total supply of fish available for local consumption in 1981, consisting of local production plus imports less exports, was about 209,000 t giving a per capita consumption of 14.23 kg. There was a considerable decline in per capita consumption after 1972 due to curtailment of fish imports to conserve foreign exchange. This decline which continued till 1977 was reversed in 1978 with the increase of fish supplies from local production and imports. The fluctuations in per capita consumption of fish since 1958 are shown in Table 7.1.

Table 7.1

Per capita consumption of fish (1958-81)

Year	1958	1965	1972	1976	1977	1978	1979	1980	1981
kg /year	15.66	14.91	14.51	10.86	10.39	11.33	12.98	14.85	14.23

Table 7.2 records the increase in producer fish prices since 1972. The sharp increase in recent years is a reflection of unsatisfied demand as well as of inflationary trends in the economy.

Table 7.2

Fish prices 1972-81 (Average price paid to the producer)

Year	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Rs./kg	1.97	2.28	3.12	3.39	4.14	4.57	6.11	6.27	7.37	9.65
Price index	100	116	158	172	210	232	310	318	374	489

In Colombo, preference among consumers in the upper income brackets is for seer, paraw and **blood** fish. Consumers in the lower income brackets buy rock fish and shore seine varieties. Consumers in the areas south of Colombo, particularly in the Galle, Matara and Hambantota districts show a marked preference for blood fish. A consumer demand for shark has developed in the couth, in recent times. Blood fish is not generally preferred in the areas notth of Colombo. In these areas, as well as in the east coast districts, shore seine varieties and rock fish are preferred. Consumer preference in the Mannar and Jaffna districts is for rock fish and shark.

Marketing at producing centres takes different forms depending on the location of the centre. In sparsely populated areas or migrant fishing centres the producer supplies his fish at prearranged prices to a trader who operates a purchasing centre at the beach. The producer is generally committed to a particular trader through a marketing advance and other facilities such as transport, rations and temporary housing provided by the trader. In densely populated areas, the producer is more independent and negotiates a sale each day with one of several competing small-scale traders who congregate at landing points, or in some instances, passes his fish through an auction conducted on the beach or in a 'Lellama' (auction shed). The CFC operates some 70 purchasing centres seasonally at important fishing centres, where fish is purchased at fixed prices determined from time to time.

Most of the fish reaching Colombo is consigned to 'commission agents' at the St.John's wholesale market who operate fish stalls leased from the Colombo Municipal Council which owns the market. The throughput of this market is probably of the order of 35,000-50,000 t per year. A small quantity (4,000 t in 1981) is consigned to the other wholesale market operated by CFC

since June 1975. In both markets some retail sales are made direct to consumers, but most of the fish passes to retail traders, who distribute it to residents of Colombo and of the suburban areas.

Fish reaching places other than Colombo, i.e., Kandy, Kurunegala, Ratnapura, Polonnaruwa, etc., is generally consigned direct to retail points. Some of the fish passes from the retail points to hawkers.

In Colombo and smaller towns, there are retail fish stalls in the public markets owned by local authorities. These stalls are leased **by** private traders from the local authorities. The CFC used to operate some fish stalls in the Colombo municipal markets. These have now been handed over to private traders on lease. Retail sales to consumers are also made by hawkers who carry fish in baskets, 'pingos' and on cycles from door to door. In rural areas and in some towns, retail sales are also made from wayside stalls.

The mark-up between producers' prices and retail prices in different parts of the country varies with area and species. It has varied between 27 and 37% during the period 1977-81 as shown in Table 7.3.

Table 7.3

Mark-up between producers' and retail prices of fish (1977-81)

Year	Average producer's price Rs/kg	Average retail price Rs/kg	Mark-up %
1977	**4.57**	**6.18**	**35**
1978	**6.11**	**7.76**	**27**
1979	**6.27**	**8.58**	**37**
1980	**7.37**	9.87	**34**
1981	**9.65**	13.06	**35**

8. EXPORT AND IMPORT

Fish exports represent only a small percentage of the total fish production. During the period 1977-81, the highest quantity exported was 3.74% in 1979. The **wet** fish equivalent of the exports in relation to the total fish production is shown in Table 8.1.

Table 8.1

Fish exports and **fish production (1977-81)**

('000 *t*)

	1977	**1978**	**1979**	**1980**	***1981***
Total fish production	**136.6**	**154.1**	**165.7**	**184.7**	**203.6**
Exports-wet fish equivalent	**3.1**	**4.5**	**6.2**	**3.5**	**4.4**

Since the country is not self-sufficient in fish, there is a restriction on exports. Export is permitted only if the following criteria are satisfied: the exported species should generally **not** be those consumed by the bulk of the population, subject, however, to exceptions in times of glut and when such exports are processed; the foreign exchange earnings should be substantial; the exports should be based on exploitation of hitherto unexploited fish resources or based on production through fish culture; the export effort should be supported by foreign investment and technology in areas where local investment and technology are deficient.

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The major export fish products have been shrimp and lobster. Over-exploitation of lobster, however, led to a depletion of stocks and in 1979 there was a considerable drop in lobster exports both in terms of quantity and value. From 1980, ornamental aquarium fish replaced lobster as the second highest exchange earner. Other traditional fish exports are beche-de-mer, shark fins and chanks. Details of fish exports from 1977 to 1981 are given in Appendix 8.1.

Fish imports generally range around 5-6% of the total fish supply (i.e. total domestic production less exports plus imports). Higher levels were however reached in 1979 and '80. The wet fish equivalent of the imports in relation to the total fish supply is shown in Table 8.2.

Table 8.2

Fish imports and fish supply (1977-1981)

('000 t)

	1977	1978	1979	1980	1981
Total fish supply	142.6	158.2	184.9	215.4	209.9
Imports-wet fish equivalent ..	9.1	8.6	25.4	32.4	10.7

Traditionally the main item of fish imports has been dried fish. The other items are prepared/ preserved fish comprising mainly canned fish and Maldive fish which is used for condiment purposes. Between 1977 and 1981 the value of prepared/preserved fish imports exceeded the value of dried fish imports during some years. Details of fish imports from 1977 to 1981 are given in Appendix 8.2.

The largest imports of equipment consist of marine engines — inboards and outboards. Except for the local assembly on a very small scale of one make of outboard engine, there is no local assembly or manufacture of marine engines. The majority of the marine engines imported comprise six makes of inboard engines of Japanese, British, Danish and Indian origin and five outboard engines of Japanese, US and Swedish origin. Table 8.3 shows the numbers and value of the outboard engines imported during 1978-81.

Table 8.3

Import of outboard engines (1978-81)

Quantity — number of engines *Value — Rs. million*

	1978		1979		1980		1981	
	Qty.	v	Qty.	v	Qty.	v	Qty.	v
Outboard engines	3226	18.6	5569	40.9	3109	25.1	1098	14.6

Fishing gear is imported mainly from Japan and Korea. The chief item of imported fishing gear is fishing nets and accessories therefor. There is a gradual decrease in imports of nets due to the increasing domestic capacity for production of nets. Table 8.4 gives the quantity and value of the imports.

Table 8.4

Import of fishing gear (1977-81)

Quantity — (t) *Value — (Rs. million*

	1977		*1978*		*1979*		*1980*		*1981*	
Item	Qty.	V	Qty.	V	Qty.	V	Qty.	V	Qty.	V
Fishing nets	369.5	11.8	443.0	35.7	298.9	38.1	191.6	21.1	—	10.8
Twine and ropes	565.9	3.5	601.6	15.8	753.4	16.4	897.6	34.8	664.0	22.1
Nylon yarn	257.8	0.4	80.7	3.6	207.9	10.7	79.7	4.4	89.6	5.8
Floats	N.A.	N.A.	5.3	0.2	15.2	0.9	15.0	0.9	11.9	0.7

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9. COASTAL AQUACULTURE

There is no tradition of coastal aquaculture or of any other form of aquaculture in Sri Lanka.

Ongoing activities in coastal aquaculture by the private sector are confined to two small-scale shrimp farms, one at Batticaloa and another at Thoduwawa, which are **yet** experimental.

The government operates a brackishwater fisheries station at Pitipana established in the early 1950s and a brackishwater fish breeding-cum-extension centre at Pambala established in the late 1970s. At the former, during the late 1950s and early 1960s, some experimental work was done on the pond culture of milk fish (Chanos chanos), mullet (Mugil spp.) and shrimp, but did not proceed beyond **the** experimental stage. At present, the main item of work at the two places is the nursing of milkfish fry collected from the wild prior to their release into freshwater bodies. An experimental project for the pen culture of Chanos chanos is being implemented in the Puttalam lagoon.

The brackishwater areas consist of about 120,000 ha of estuaries, lagoons and mangrove. Two-thirds of this area consists of large river estuaries and lagoons permanently open to the sea. The balance (40,000 ha) consists of tidal flats, mangrove and small lagoons. Many of the small lagoons are either completely closed off from the sea or closed off by shifting sand bars during a major part of the year. There are wide variations in the salinities of the lagoons -they fluctuate from levels higher than in the open sea due to evaporation to lower levels due to heavy rainfall. The tidal amplitude is low, not more than 0.7 m at springtides and 0.05 m at neaps.

The soil in most coastal areas is sandy or overlain by sand even in areas where there is occurrence of heavy clay. Subsoils are often of the acid sulphate type.

The following are some indications regarding the prospects for coastal aquaculture:

- low tidal amplitude and sandy soils are significant factors that will inhibit the development of brackishwater pond culture.
- many sites which are suitable for pen and cage culture appear to be available and the introduction of such culture systems may have better prospects than pond culture.
- sufficient concentrations of milkfish fry have **been** identified on the northwest-coast to support a commercial farming operation but in view of **the** adverse ecological factors a special system of cultivation would need to be developed.
- some information is available about the geographical distribution of the various shrimp species and the seasonal availability of post-larvae; surveys are continuing. The extent to which it would **be** possible to develop pond culture of shrimp is uncertain **because** of the adverse ecological factors.
- there may be some prospects for the polycuiture of shrimp and finfish such as Chanos, Mugil in salterns.

The development of coastal aquaculture is one of the functions of the Inland Fisheries Division, which has set up a mariculture unit for the purpose. In view of the complex technical problems involved, the strategy being followed in Sri Lanka is to train personnel and carry out preliminary surveys in order to build up a strong base for further development. An aquaculture development project funded by the Asian Development Bank contains a coastal aquaculture **component** relating to the establishment of a shrimp hatchery and the establishment of brackishwater ponds for demonstrating **the** feasibility of coastal aquaculture.

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10. SOCIO-ECONOMICS

A census of fisheries conducted in 1972 showed that there were about 43,000 households with a total membership of 250,000 persons and an active fishermen membership of 50,000 engaged in the coastal fisheries at that time. On the basis of the annual rates of population increase, the total fishing population in 1981 is estimated at 308,000 and the number of active fishermen at about 72,000. The distribution, according to District Fisheries Extension Officers' divisions, is shown in Appendix 10.1.

The number of persons employed in activities ancillary to fishing such as marketing, fish curing, boat building, etc. is estimated at about 18,500 with about 42,000 dependents. The employment in ancillary activities is shown in Table 10.1

Table 10.1

Employment in ancillary activities

Activity	No. employed
Marketing	7,850
Boat building	640
Net making	410
Ice making	1,340
Fish/prawn processing	1,680
Fish curing	6,600
Manufacturing of fish meal, Maldive fish, etc. ..	40
Total	18,560

The total employment would therefore be of the order of about 90,000 persons and the population dependent on fisheries as a source of income would be about 368,000.

The fisherfolk do not have any informal political institutions of a traditional nature. Their most important political channel to regional and national politics is the Member of Parliament. Leadership at the village level is also generally connected with national party politics rather than with custom or tradition.

The nuclear family system predominates among the fisherfolk, but the extended family system still exists to a small extent.

The traditional fishing caste is Karava (among the Sinhalese) and Karaiyar (among the Tamils), but people of many other castes are now engaged in fishing. Thus, occupationally caste has little significance in fishing as in other spheres of economic activity nor is it an important determinant of social status.

The role of women in the fishing communities varies in different geographical areas. As far as fishery-related activities are concerned, on the northwestern coast, they own and rent fishing equipment and even participate in active fishing. On the northwestern and western coasts, they participate in fish trading, fish processing and net mending ; on the eastern and northeastern coasts, their participation in fishery activities is minimal, being confined to fish processing; on

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the southern coast, women sometimes engage in lagoon fishing and in retail sales of fish; in many areas, modernization in transport and infrastructure facilities have deprived women of traditional occupations such as fish vending, processing and net mending. In all areas, they are responsible for the care of the children and household chores. In the households of migrant fishermen, they have the full responsibility for managing and providing for the household when the men are away. In some areas, women in the fishing communities are also engaged in the coconut fibre industry and in handicrafts such as mat and basket weaving and lace making.'

The level of literacy in the fishing communities is far below the national average. The majority of children do not proceed beyond primary school and a small percentage (estimated at about 11%) do not have any formal education.

The 1972 census showed that about 44% fishing households did not own any boats or fishing equipment and provided labour only; of the remainder, nearly 40% owned fishing craft while the balance owned fishing gear only.

The socio-economic survey of Sri Lanka(1969/70) gave an average income (per income receiver in fishing) of Rs. 199 per month and thus an average monthly income of Rs. 338 per household on the basis of an average of 1.7 income receivers per household. A more recent survey' gives an average monthly income of Rs. 1,006 and an average monthly expenditure of Rs. 890. The same survey showed that the major part of the income is spent on food and repayment of debts, that substantial amounts are spent on alcohol, tobacco, gambling, kerosene for cooking and lighting and that the expenditure on children's education and clothing is minimal.

The 1972 census showed that 83% of the fishing households depended on fishing as the sole source of income. For the others, additional sources of income, depending on the area, would include toddy tapping, manufacture and sale of handicrafts by the women and coconut fibre-based cottage industries.

About 4,000 fishermen migrate every year from the west and south coasts to the east coast during the southwest monsoon from April to October. There is also migration from the west coast to the northwest coast during some of the northeast monsoon months.

Fishing does not enjoy a high status as an occupation, as compared for instance with white-collar jobs, but in view of the relatively high incomes that it generates, has a substantive position among manual occupations.

Thanks to a long-term programme of constructing fishery roads, most fishing villages are accessible with the result that the position regarding availability of education, transport and communication facilities and medical services *to* the fisherfolk is no different from that of the *rest* of the rural population. Potable water and better housing are felt needs in many fishing villages.

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[1] **"Report of the Survey on Socio-Economic Conditions of Fisherwomen in Sri Lanka" by Women's Bureau of Sri Lanka (unpublished), 1982.**

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11. FISHERIES ADMINISTRATION AND INSTITUTIONS

11 .1 Fisheries administration

The subject of fisheries is under the charge of the Minister of Fisheries who is assisted by a Deputy Minister. The main administrative and policymaking organization for fisheries in Sri Lanka is the Ministry of Fisheries. It was set up in 1970, and since 1978 has been organised as an integrated ministry with several divisions. The functions of the Ministry are to promote the development of the fishing industry, regulate fisheries activities and look after the welfare of those engaged in fishing. The administrative head of the Ministry is the Secretary who is assisted by two Additional Secretaries. The Directors who head the divisions of the Ministry report either directly qr through the Additional Secretaries to the Secretary. There are eight divisions: Planning and Programming, Development, Marine Fisheries, Welfare, Inland Fisheries, Training and Education, Finance and Administration. The former Coast Conservation division is now a department of the Ministry. The Ministry is guided in its activities by a Parliamentary Consultation Committee and a local Investment Advisory Committee. A statutory agency, the National Aquatic Resources Agency (NARA) and two state industrial corporations, the Ceylon Fisheries Corporation (CFC) and the Ceylon Fishery Harbours Corporation (CFHC), are agencies of the Ministry. An organisational chart is given in Appendix 11 .1.

The Ministry has a field network consisting of 14 District Fisheries Extension Offices, 88 Fishery Inspectors' Offices, four Fisheries Training Centres, 14 Inland Fisheries Stations and three Inland Fisheries Extension Centres.

The Ministry has a total staff of 1,778.

The budget of the Ministry is provided under three programmes. The total budget allocation for 1982 was Rs. 201.3 million of which Rs. 174.1 million constituted capital expenditure. A summary of the budget for 1982 is given in Appendix 11.2.

11.2 Research and development institutions

The National Aquatic Resources Agency (NARA) was established as a corporate body by an Act of Parlia ment in 1981. Its functions are to develop and manage renewable and non-renewable aquatic resources; to promote and coordinate research activities among institutions engaged in the exploitation and development of these resources; to undertake research studies related to resources development; to provide advisory services on scientific, technological and legal matters relating to the management and development of resources; and to provide training of personnel.

The structure of NARA comprises the National Aquatic Resources Management Council, the Governing Board, the Scientific and Technical Committee and the Secretariat of the Agency headed by a Director-General. An organisational chart is given in Appendix 11.3.

While tha functions of NARA relate to areas besides fisheries, its present activities are concentrated mainly on fisheries research and post-harvest fish technology. The fisheries activities include ***inter alia*** population studies of commercially important fish species, studies of the tuna and prawn fisheries, survey of pearl oyster beds, algal and seaweed surveys, investigation of the fisheries potential of lagoons, monitoring of the coastal fishery, experimentation and technology development in handling, processing, storage, transportation, packaging and retailing of fish, enforcement of quality control of fish products, and fishing **boat** and gear technology. The nucleus for the performance of these activities consists of two former Ministry divisions, the Research Division and the Fish Technology Institute which were transferred to NARA and now function within the framework of the latter.

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NARA is located at Crow Island, Colombo North, and has modern facilities for experimental processing and analysis of fish and fishery products, laboratory facilities for fisheries research and some experimental fishing vessels.

The agency has a total staff of 150 of which 45 are professional officers. Its total budget in 1982 was Rs. 9.0 million of which Rs. 5.0 million constituted capital expenditure.

11.3 Training institutions

The ***Sri Lanka Fisheries Training Institute*** was established in 1975 with Japanese assistance to impart theoretical and practical training for the improvement and development of off-shore and deep-sea fishing techniques.

The institute conducts a Fishing Vessel Engine Room Officers' course and a Fishing Vessel Deck Officers' Training course, each of 18 months' duration. They aim at preparing the trainees for examinations in the respective fields conducted according to standards laid down by Commonwealth countries such as UK and India. The present intake of trainees is about 20 per course which may be progressively increased to 30. Between 1977 and 1982, 120 trainees graduated from the institute.

The institute is located at Crow Island, Colombo North. The facilities include lecture rooms, demonstration rooms with fishing gear, engines and other machinery, fish-finding and navigation equipment, hostel for 65 trainees, transport vehicles, and several fishing vessels including a tuna longliner and a pole-and-line boat.

The institute has a staff of 9 lecturers and 2 assistant lecturers and 29 other staff. The budget in 1982 was Rs. 6.8 million of which Rs. 2.3 million was for capital expenditure. The institute's operations are supervised by the Training and Education Division of the Ministry.

Four ***Fisheries Training Centres*** are in operation at Negombo, Tangalle, Batticaloa and Jaffna. The centre at Negombo was the first to be established with Japanese assistance in 1962. The others came into operation in 1973.

The purpose of the training centres is to train fishermen and mechanics for the coastal fisheries. Originally they conducted two types of courses -a six-month course in fishing methods and a 12-month course in engine repair and maintenance. In 1979 the two courses were merged into a 12-month Fishing Boat Operators' Course. Each centre has a trainee capacity of 30 per annum. Between 1977 and 1982, 665 persons received training at the four centres.

The centres are equipped with engines, fishing equipment and fishing boats of up to 10 m for demonstration purposes.

The staff of the four centres consists of 25 instructors and 13 demonstrators and 116 other staff. The annual recurrent expenditure for all four centres in 1982 was Rs. 1.5 million and the capital expenditure Rs. 1.3 million.

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12. INDUSTRY ORGANIZATIONS

12.1 Fisheries Corporations

12.1.1 Ceylon Fisheries Corporation (CFC)

The CFC was established in 1964 under the State industrial Corporations Act to assume the commercial activities carried out at the time by the Department of Fisheries and the Ceylon Cooperative Fish Sales Union.

The main purpose for which it was set up was to catch, purchase and sell fish. The original objectives also include fish processing, construction and operation of fishery harbours and associated shore facilities, import and sale of fishing gear, construction, repair and maintenance of fishing boats and general fisheries promotion. In 1972 the size and variety of operations was reduced by the transfer of functions concerned with fishery harbours to a new corporation (CFHC). Since 1977 the CFC's fishing operations have been considerably curtailed. More recently, its boat-building activities were transferred to the Cey-Nor Development Foundation. In 1980, a considerable retrenchment of the excess staff with which the CFC had been burdened for many years was effected. Another important measure taken **in 1980 was the decentralization of operations by the establishment of 10 profit centres, which operate as autonomous units with a portion of the profit shared among employees.**

The operational centre for the CFC is the Mutwal Fishery Harbour. The shore facilities at Mutwal are being currently refurbished to provide cold storage of 800 t, freezing capacity of 25 t and a 10 t block ice plant. Shore facilities outside the Mutwal harbour consist of four cold storages with a total capacity of 255 t at Pesalai, Batticaloa, Colombo, and Kandy and six ice plants with a total capacity of 45 t/day at Wennappuwa, Pesalai, Ratnapura, Anuradhapura, Hambantota and Jaffna.

The fishing activities of the CFC are limited to the operation of two trawlers, some 34' driftnetter /longliners, and a number of 28' boats, on a catch share basis. The 34' and 28' boats are operated through the regional set-up.

The CFC operates two wholesale markets at Colombo and Kandy, ten retail stalls in various parts of Colombo and thirty retail sales points in the outstations. There is a fleet of 107 transport vehicles of which 44 are insulated trucks and 13 are refrigerated trucks.

For operational purposes, the island is divided into eight regions, each operating as a profit centre under an executive regional manager. Each centre meets its operational costs from incomes generated through regional fish production, purchasing and marketing.

Around 70 fish purchasing centres are operated at important fish landing centres along the coast. Most of the purchasing centres function seasonally using temporary structures.

The CFC has a five-member Board of Directors. One of the Directors functions as full-time Chairman. The executive staff is headed by a General Manager who is directly responsible to the Board of Directors. The total staff strength is 420 of which 46 are professional officers.

The CFC had a capital expenditure budget of Rs. 3 m in 1982. Its recurrent expenditure and revenue are handled at the regional level.

As a result of the reorganisation to which it has been subject, the CFC's role has been virtually limited to that of a distribution and marketing outfit.

Presently marketing about 4.0% of the total marine production, the CFC is intensifying its effort to compete with the private fish trade.

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12.1.2 Ceylon fishery Harbours Corporation (CFHC)

The CFHC was established in 1972 under the State Industrial Corporations Act to take over part of the activities of the CFC. The tasks assigned to the CFHC are the establishment, construction, maintenance, operation and management of fishery harbours, anchorages and shore facilities and the provision of repair and maintenance facilities for fishing craft.

The CFHC is responsible for the operation of six fishery harbours, viz. Galle, Trincomalee, Beruwala, Tangalle, Mirissa and Myliddy. Three additional harbours are being constructed at Mannar, Wennappuwa and Valachchenai. The CFHC is also responsible for six anchorages at Negombo, Chilaw, Kalmunai, Sagarapura, Kalpitiya and Hambantota -some shore facilities are also provided at the first three anchorages. At Chilaw it operates a boat-building yard with annual capacities of 150 and 50 respectively for 18' and 28' FRP boats.

Since 1977 the CFHC has undertaken various items of construction work to augment its revenues. During the period 1977-1982 these included the construction of 1,750 fishermen's houses, 13 inland fisheries stations, wells and water supply schemes for fishermen.

The CFHC's budget for 1982 was as follows:

	Rs. million
Capital Expenditure	15.0
Recurrent Expenditure	**18.2**
Total	33.2

CFHC hasa five-member Board of Directors. One of the Directorsfunctionsas part-time Chairman. The executive staff is headed by a General Manager who is directly responsible to the Board of Directors. The total staff strength is 658 of which 41 are professional officers.

The main problem of CFHC is the heavy recurrent expenditure commitment on the maintenance of harbours and shore facilities, particularly those designed originallyto service and accommodate a fleet of large deep-sea fishing vessels that were ultimately not introduced into the country's fisheries. It has also not been possible to attract foreign fishing vessels to use these facilities. Curtailment of the originally planned scope and size of the harbours not yet completed and greater concentration on the provision of facilities for smaller fishing vessels are planned for the future.

12.2 Fisheries cooperative societies

The first fishery cooperatives were registered in 1941 as a result of the recommendations of a commission appointed **by** the Government in 1938 to inquire into the fishing industry. A decision to channel loans, given **to** fishermen as part of the fish marketing scheme operated by the Department of Fisheries between 1942 and 1948, as far as possible through cooperatives, gave an impetus to their formation.

The role of fishery cooperatives was reviewed in 1970 and was re-defined as being the organization of fishermen for improvement of the efficiency of the small-scale sector of the industry in the catching, handling and marketing of fish. Between 1970 and 1973, under a scheme of reorganization, 292 small primary societies were amalgamated into 45 large primaries. The membership of primary fishery cooperatives in 1982 was 24,904 or about 34% of the total number of fishermen.

Each primary society has a nine-member Board of Directors consisting of six members nominated by the Commissioner of Cooperative Development and three members elected by its branches. The chief executive is a General Manager appointed by and responsible **to** the Board. The activities of each society are subject to by-laws and working rules adopted by the society.

There are three regional unions, the Northern Province Fishermen's Cooperative Societies Union (NPFCSU), the South-Western Fishermen's Cooperative Union, the Southern Regional Fisheries Cooperative Union and an apex organization, the Ceylon Cooperative Fish Sales Union (CCFSU).

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The Cooperatives' main source of finance is the Government which channels funds to them through the Ministry of Fisheries for purchase of motorized boats, outboard motors, fishing gear, repairs, construction and purchase of indigenous craft. Credit is also provided by the People's Bank and Bank of Ceylon for fishing gear and engine spare parts.

3½ ton boats are issued by the Department of Fisheries on hire-purchase only to fishery co-operatives. Three hundred and fifty-three boats were issued during the period 1977 to 1982.

Table 12.1 summarises the position regarding loans given to fishery cooperatives during 1977-82.

Table 12.1

Loans granted to fisheries cooperative societies 1977-I 982

(Rs. million)

Type of loan	Total amount lent	Repayment due	Amount repaid	Arrears
1. Loans for the total value of boats and equipment	86.4	58.5	14.0	44.5
2. Cash loans for additional fishing gear	2.3	2.3	1.7	0.6
3. Short-term (2 year) loans to meet costs of hulls and fishing gear	33.0	33.0	29.0	4.0
4. Total	**121.7**	**93.8**	**44.74**	**9.1**

The cooperatives succeeded in achieving a substantial membership, particularly during 1970-77, when they constituted the main channel for government assistance to the industry. The establishment of large primaries, however, led to a certain loss of identity between the fishermen and their cooperatives and some degree of alienation between the members and the Boards of Directors with their majority of nominated members. There was considerable inefficiency in the operation and maintenance of the 3½ ton boats, the repayment of loans fell far below anticipated levels, staff in excess of actual needs was employed and most societies showed operating losses. Some improvement in the recovery of repayments due in respect of 3½ ton boats has been effected more recently by the transfer of ownership of the boats from the societies to individual skippers.

The present credit policies, in terms of which individual fishermen are eligible to obtain the benefit of credit from the state banks and government subsidies irrespective of membership in cooperatives, have vitiated the role of the cooperatives, and their importance within the industry is much less than it appears to be from the membership figures on the rolls.

13. GOVERNMENT POLICY

The overall economic and financial policy of the government is designed to create a liberal economic environment and to guide the economy towards a course of rapid and self-sustaining growth by dismantling administrative controls and encouraging private enterprise. The development objectives are: acceleration of the growth rate; expansion of employment; rehabilitation and expansion of the capital stock; and a progressive improvement in the balance of payments.

High priority has been accorded to fisheries development by the government in view of the industry's contribution to food production and nutrition, its employment potential, its potential as a valuable foreign exchange earner through export of fish and fishery products, and its socio-

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political significance due to an influential segment of the population of some 45 coastal electorates being in some way connected with the fishing industry.

The priority given to fisheries development is reflected in the progressively increasing budgetary resources made available each year for fishery development.

Fisheries policy is designed to achieve the objectives of increasing fish production ; raising per capita consumption; raising the income and living standards of the fishermen; and maximising employment opportunities in the fisheries sector. Key elements of the fisheries policy are: assignment of the predominant role in fishing operations, manufacture and supply of fishing vessels, engines and other inputs to the private sector; limitation of state-sector intervention to provision of infrastructure, institutional support and incentives for investment including tax concessions, subsidies and concessionary bank financing; development of the coastal fishery through the efforts of small-scale fishermen; development of offshore fisheries through local companies or individuals and with foreign collaboration; promotion of the deep-sea fishery through joint ventures or similar arrangements; and the according of high priority to the development of inland fisheries.

The subsidies and bank credit available for purchase of fishing craft, engines and fishing gear are shown in Appendix 13.1 and the subsidies provided to promote the development of inland fisheries in Appendix 13.2.

Appendix 13.3 lists the other extensive incentives and concessions provided for investors in the fisheries sector.

14. DEVELOPMENT PLANS

The initial attempt at fisheries development planning was made in the 10-year plan of 1957. This was followed by a medium-term development programme for the period 1972-1976 which was subsequently extended up to 1977.

The present programme of fisheries development is being carried out in terms of a Master Plan formulated for the period 1979-83. It is a comprehensive indicative plan embracing all aspects of the industry, and incorporates the objectives and strategies of fisheries policy referred to in Chapter 13.

The plan provides for a substantial increase in the existing fishery by the introduction of more boats. Fish catching and boat-building operations are left to the private sector while concentration by the public sector is on the provision of infrastructure, support services and incentives.

The master plan envisages a per capita consumption of 20 kg by 1983. The targeted total fish production increase by 1983 is 146,000 t comprised of 81,000 t from the coastal fishery, 34,000 t from the inland fishery and 31,000 t from the offshore and deep-sea fisheries.

These targets are planned to be achieved by:

- a substantial increase in the number of motorized coastal fishing vessels of established design (28'-32' class) and outboard engines for mechanizing traditional craft.
- introduction of a number of larger motorized vessels of new design (34' and 50' class)
- increase in the fishing time and operational efficiency of the fishing fleet by ensuring the availability of adequate supplies of fishing gear, engine spare parts and by several programmes of investment in infrastructure for the fishing industry.
- ensuring that adequate finance is available for investments by provision of subsidies, credit and incentives to private-sector investors.

The plan provides for an increase in the number of 28'-32' boats from 2,240 in 1979 to 3,026 by 1983 and the number of outboard motor craft from 6,000 in 1979 to 10,530 by 1983. The pro-

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posed phasing of introduction of coastal fishing vessels and the expected output are detailed in Appendices 14.1 and 14.2. Similar details in respect of the larger vessels planned to be introduced under various externally funded projects into the off-shore and deep-sea fisheries are given in Appendix 14.3.

In view of the high capital cost of deep-sea vessels and the lack of local experience in deep-sea fishing, the plan assumes that a deep-sea fishery for tuna can only be established with foreign assistance.

The plan emphasizes the development of inland fisheries. The justification is the expectation that the marine fisheries would be heavily exploited by 1983; the creation of major new water bodies under the Mahaveli Development Programme and the rising energy costs of marine fishing. The constraints are analysed and measures spelt out to overcome the constraints. These include provision of credit and subsidies for purchase of craft and gear for fishing in inland waters; resource development in seasonal tanks and subsidies for fish ponds.

Achievement of the plan targets for introduction of boats is to be promoted by subsidies, incentives, a scheme for providing credit through the state-owned commercial banks, and the adoption of liberal policies to support boat-building, repair and maintenance services and supply of engine spare parts and fishing gear by the private sector.

The harbour investment programme in the plan emphasizes lower-cost alternatives as opposed to expensive harbour construction works. These include the opening of river mouths and the construction of breakwaters, jetties and shore facilities in suitable sheltered places. The existing harbours are to be upgraded and reconditioned to meet the needs of offshore fishing vessels and their use by coastal fishing vessels is to be promoted.

The plan spells out the strategies for fish marketing and a support investment programme for infrastructure which includes the following components :

- 48 insulated beach holding rooms
- 10 refrigerated holding rooms in consumer districts
- cold storage complex
- 69 ice plants
- 4 mobile ice plants
- 22 refrigerated trucks.

Private sector investment is envisaged for the ice plants and cold storage while the CFC is to invest in the remaining items.

The plan provides for a fishermen's welfare programme in terms of which the construction of 10,800 houses, 1,350 drinking water wells and 50 miles of roads, and the repair of 80 miles of existing roads would be undertaken.

The components of programmes for fisheries research and development embracing marine fisheries, inland fisheries, fishing craft and gear technology, fish handling and processing and for fisheries training and education are outlined and provision is made for them in the plan.

The total capital cost of the investment programme in the Master Plan over the period 1979-83 is estimated at Rs. 1898.7 million, of which Rs. 1248.5 million is foreign exchange cost and Rs. 650.2 million is local currency cost. The total investment is proposed to be shared as follows :

— Ministry of Fisheries	Rs. 601.8 million (32%)
— CFC & CFHC	Rs. 377.7 million (20%)
— Private sector	Rs. 919.2 million (48%)

A breakdown of the capital cost is given in Appendix 14.4.

A substantial component of the expenditure is expected to be financed by foreign aid. The latter includes several ongoing externally funded projects which are listed in Appendix 14.5.

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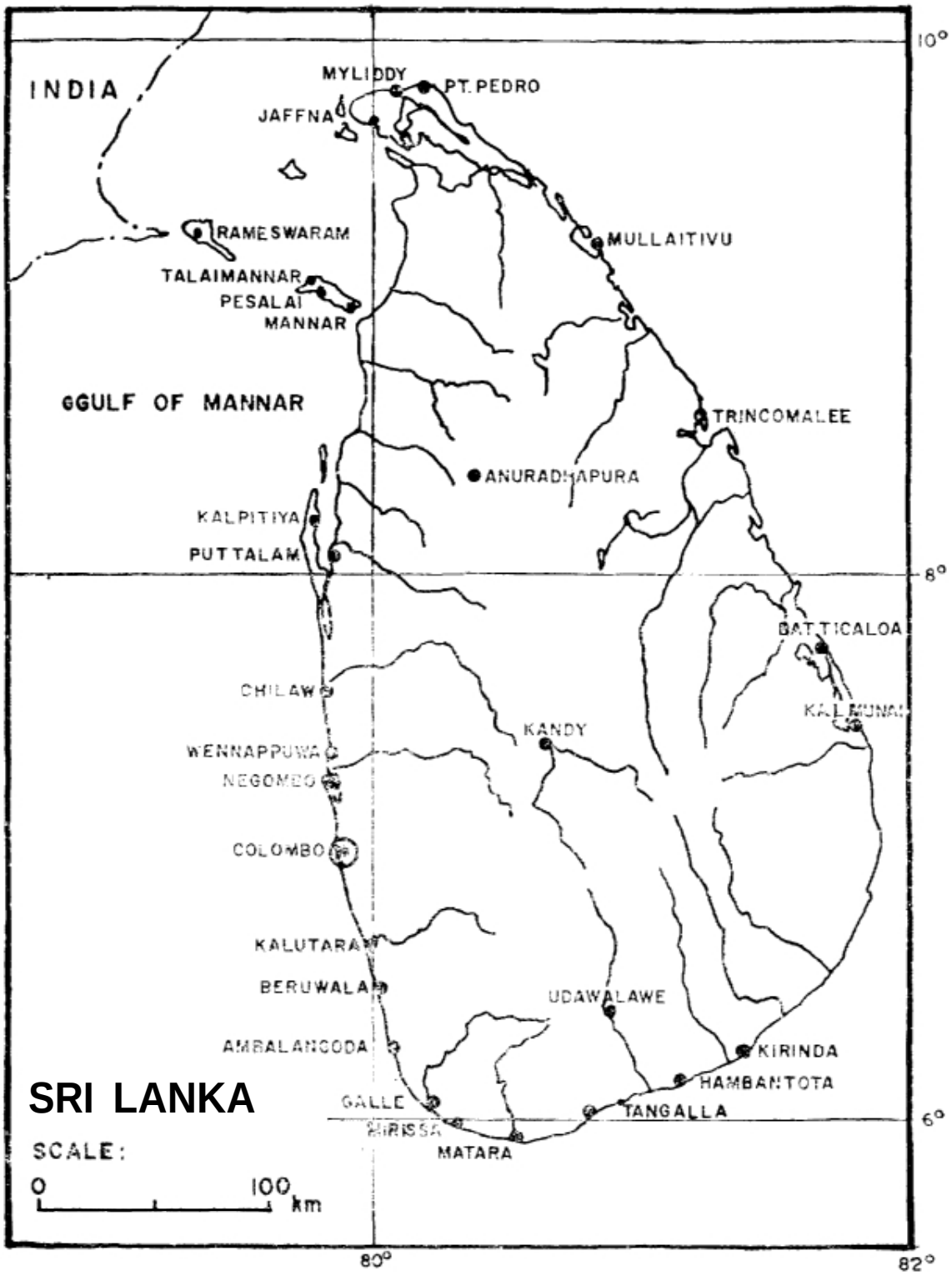
Appendix 1.1:

MAP OF SRI LANKA



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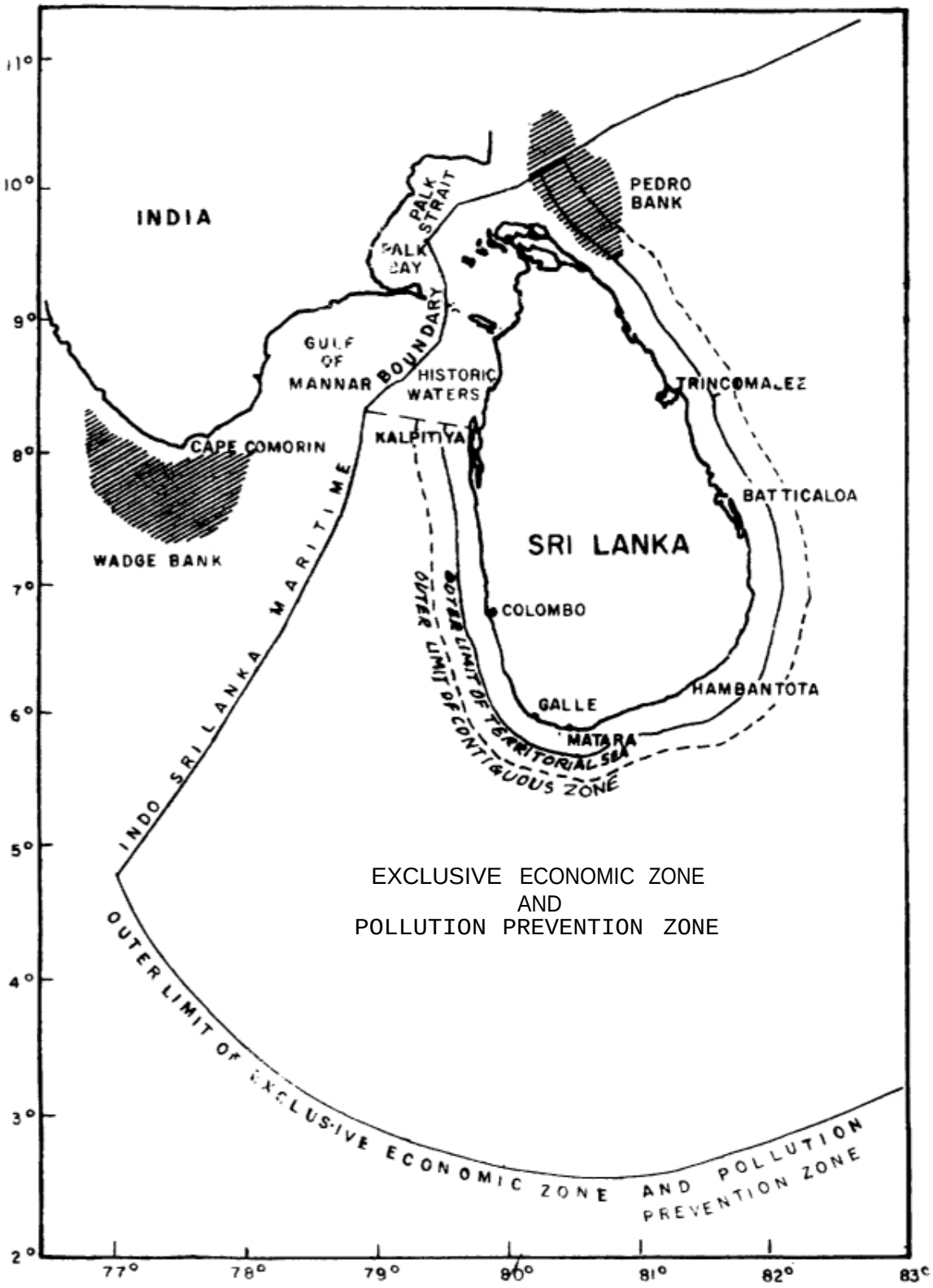
Appendix 1.2

THE EXCLUSIVE ECONOMIC ZONE AND MARITIME BOUNDARY OF SRI LANKA



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Appendix 1.3

COUNTRY DATA

1. Location:	Sri Lanka is situated in the Indian Ocean south-east of India.	
	Latitudes : 6°N – 10°N	
	Longitudes : 80°E – 82°E	
2. *Size:*	Area	*65,600* km^2
	Coastline	1,770 km
	Continental shelf	*28,000* km^2
	(200 m depth or Indo-Sri Lanka maritime boundary)	
3. Population.	Total	14.85 million (1981 Population Census)
	Urban	*21.51%*
	Rural	*78.49%*
	Density	*230* per km^2
	Annual growth rate	*1 . 7 %*
	Birth rate	*2.76% (1980)*
	Mortality rate	*0.61% (1980)*
	Life expectancy :	
	Males	*64.6 (1971)*
	Females	*67.1* (1971)
4. Education:	Literacy rate for population 10 years and over	
	Total	86.5% (1981 population census)
	Males	90.5% (1981 population census)
	Females	82.4% (1981 population census)
	Number of government schools (1981) : 9521	
	Number of pupils in government schools (1981): 3.37 million.	
5. Health (1981):	Population/hospital bed	*346*
	Population/physician	*7560*
6. *Nutrition* (Food balance sheet, 1980) :		
	Per capita calorie intake of requirement:	99.5%
	Per capita protein intake	46. 6gm/day

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*7. Employment:**

Employment by categories

Category	No.	% of labour force
Agriculture, Hunting and Forestry	2,172,722	45.9
Mining and Quarrying	63,680	1.3
Manufacturing	568,162	12.0
Construction	229,134	4.8
Services	1,389,108	29.3
Others .. .	314,868	6.7
Total labour force	4,737,674	100.0

Rate of unemployment (1975) 19.8%**

8. ***GDP (1981):*** (1) Total Rs. 37,805.7 million (at 1975 constant prices)
Per capita Rs. 2,546
Growth of GDP 5.79% (average 1977-1981).

(2) Fisheries contribution to the GDP (at 1975 constant prices) Rs. 601.8 million =1 .59%

9. Trade:

Exports (1981)

Item	F.O.B. value (Rs. million)	%
Tea	6,430	32
Rubber	2.880	14
Coconut products	1,017	5
Gems and jewellery	304	2
Others	9,287	47
Total	19,918	100

* ***Source:*** Socio-economic survey of 1980/81.

** ***Source:*** Economic Review, January 1977.

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Imports (1981)

Item	C.I.F. value (Rs. million)	%
1. Food	*4,888*	*14*
2. Textiles	*2,334*	*7*
3. Intermediate goods	17,944	51
4. Investment goods	7,956	*22*
5. Others	2,129	*6*
Total	*35,251*	**100**

Trade balance (1977-81)

(Rs. million)

	1977	*1978*	*1979*	1980	1981
Exports	*6,638*	*13,206*	15,273	*17,388*	*19,918*
Imports	*6,007*	*14,663*	*22,560*	*33,637*	*35,251*
Balance	*+631*	*-1,457*	*-7,287*	*-16,249*	*-15,333*

10. ***Prices:***

General price index and annual change

	1977	**1978**	**1979**	**1980**	**1981**	1982
General Price index (1952=100)	*203.2*	*227.8*	*252.3*	*318.4*	*376.4*	*416.6*
Annual % change		*12.11*	*10.76*	*26.12*	**18.29**	10.68

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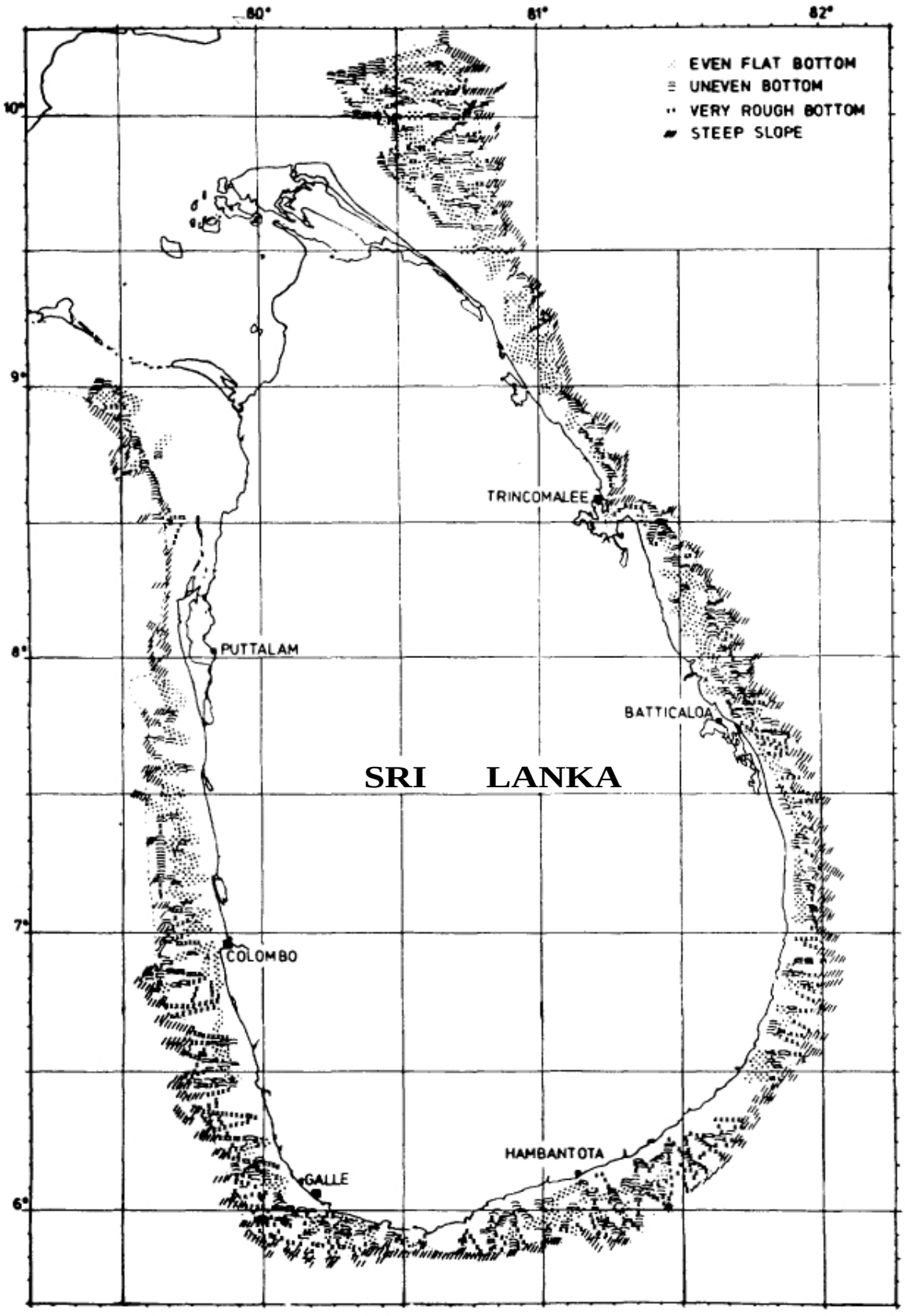
Appendix 2.1

BOTTOM CHARACTERISTICS OF THE CONTINENTAL SHELF



Source: "A survey of the coastal fish resources of Sri Lanka." Report no. 11, April—June 1979

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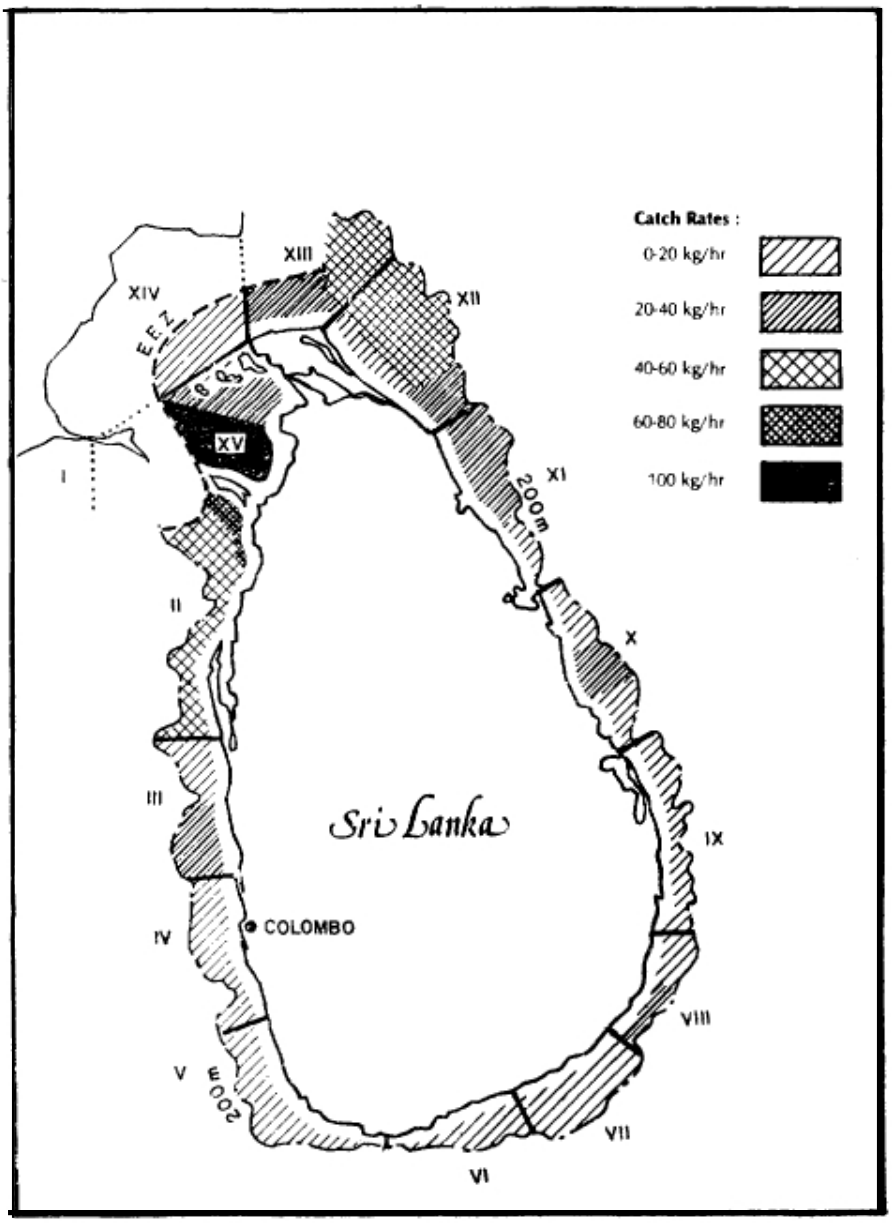
Appendix 2.2

MEAN CATCH RATES OF DEMERSAL FISH IN VARIOUS FISHING AREAS FOR TRAWLERS OF APPROXIMATELY 100 hp.



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Appendix 3.1

DISTRIBUTION OF FISHING CRAFT (1981)

DFEO Division	Fishing Craft				
	Mechaniscd			Non-mechanised craft*	Total
	3½ ton boats	5.3-5.7 m FRP boats	Traditional craft		
North- Western Region					
Puttalam	196	953	961	1,138	3,248
Chilaw	103	1,197	195	941	2,436
Western Region					
Negombo	304	558	167	1,275	2,304
Colombo	80	45	5	292	422
Kalutara	186	16	4	722	928
Southern Region					
Galle	412	113	239	693	1,457
Matara	132	156	97	1,274	1,659
Hambantota	189	27	111	970	1,297
Eastern Region					
Kalmunai	53	19	35	558	665
Batticaloa	55	207	55	2,614	2,931
Trincomalee	253	213	115	1,288	1,869
Northern Region					
Mullaitivu	206	275	315	582	1,378
Jaffna	632	946	1,468	2,856	5,902
Mannar	347	1,013	217	512	2,089
Total	3,148	5,738	3,984	15,715	28,585

*** Includes beach seine craft.**

Source: **Ministry of Fisheries.**

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Appendix 4.1

INFRASTRUCTURAL AND OTHER REQUISITE FACILITIES AND SERVICES AT FISHERY HARBOURS

Harbour facilities	Galle	Trinco-malee	Mutwal	Beruwela	Tangalle	Mirissa	Myliddy
Basin area (ha)	05	20	8,000 sq.ft.	*10*	02	07	03
Dredged depth (m-below LWOST)	06	06	07	02.5	02.5	02.5	02.5
Quay wall length (m)	192	152	—	—	102	156	—
Jetty length (m)	91	30	115	55	—	—	—
Slipways (t)	500	20	—	—	20	—	—
Boat lifting (t)	—	—	—	—	—	05	—
Shore facilities							
Holding room fish on ice (t)	400	—	—	25	50	05	
Processing room (m^2)	750	170	—	125	—	—	
Frozen fish storage (t)	2,400	200	400	200	—	—	
Freezing capacity (t/day)	16	10	—	10	—	—	
Block ice (t/day)	—	10	—	—	10	—	
Flake ice (t/day)	50	—	—	10	—	—	
Contact freezers (t/day)	4	—	—	—	—	—	
Ice storage (t)	150	60	—	50	20	10	
Office area (m^2)	721	200	—	90	90	32	
Stores area (m^2)	4,180	290	204 sq.ft.	107	100	60	
Market area (sq/m)	1,580	155	—	260	—	—	—
Services							
Workshop (m^2)	3,492	493	—	205	120	195	—
Water tank (lit)	341,000	318,000	—	136,000	114,000	18,000	232
Fuel tank (lit)	227,000	—	—	9,100	9,100	9,100	—

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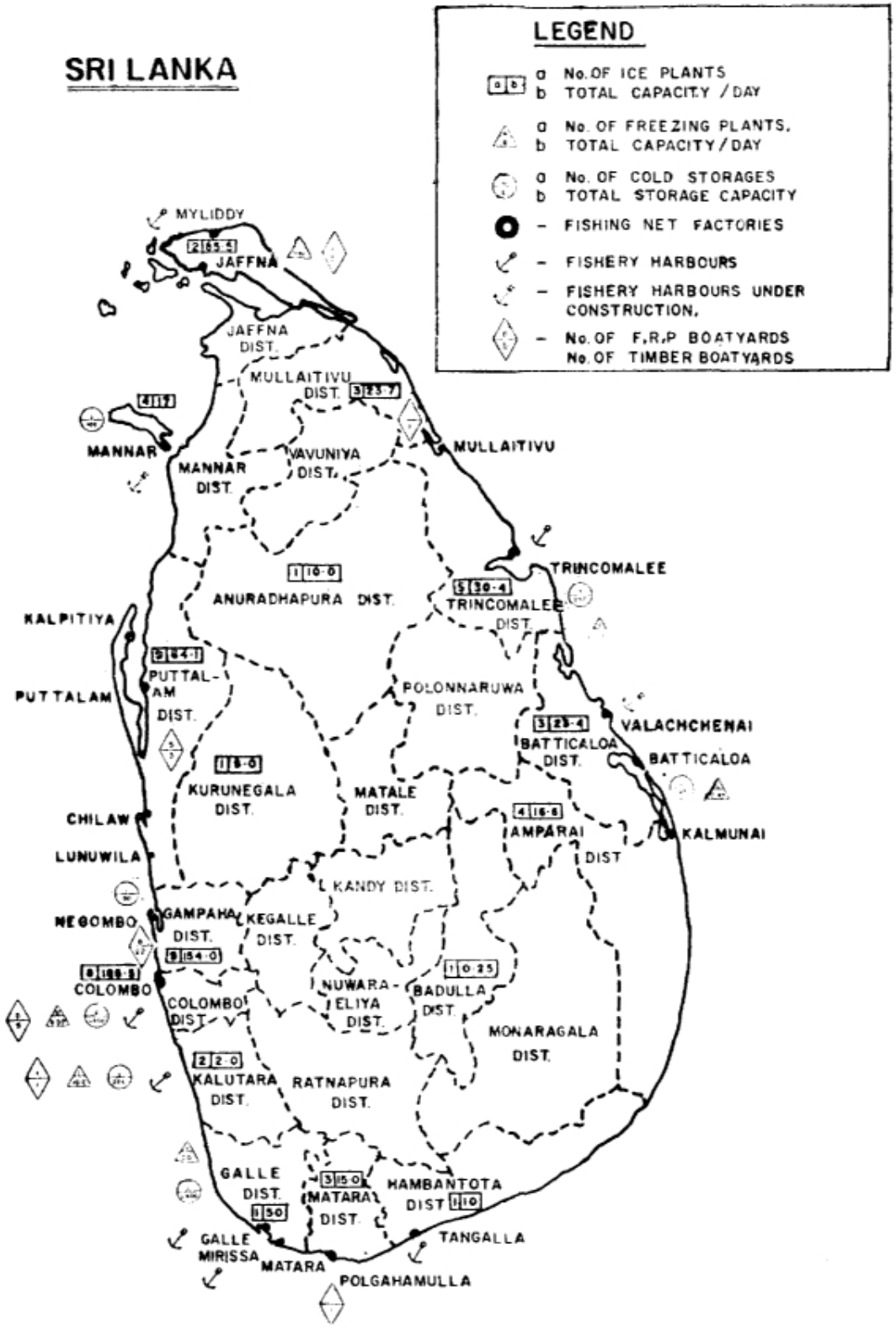
Appendix 4.2

DISTRIBUTION OF !NFRASTRUCTURE FACILtTIES



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Appendix 5.1

MOST COMMON MARINE FISH SPECIES AND GROUPING FOR PRODUCTION STATISTICS

Group	*Family*	*English*	*Local*
Seer	Scomberomoridae	Spanish Mackerel	Thora, Anjila
Paraw	Carangidae	Horse Mackerel	Paraw, Katta
Blood Fish	Thunnidae	Skipjack	Balaya
		Mackerel Tuna	Attawalla
		Frigate Mackerel	Alagoduwa
		Yellow Fin	Kelawalla
	Istiophoridae	Sail Fish	Thalapath
		Marlin	Koppara
	Xiphiidae	Sword Fish	Gappara
Sharks	Carcharinidae and related forms	Shark	Mora
Skates	Trygenidae and related forms	Rays	Maduwa
Rock fish	Lutianidae	Snappers	Kalameeya
	Lethrinidae	Breams	Meevatiya
	Sciaenidae	Croakers	Pannava
	Serranidae	Groupers	Kossa
Shore seine varieties*	Clupeidae	Sardines	Salaya
		Herrings	Hurulla
	Engranlidae	Sprat	Halmassa
		Anchovy	Laagga
	Chirocentridae	Wolf herring	Katuvalla
	Scombridae	Indian mackerel	Kumbala
	Trichiuridae	Ribbon fish	Savalaya
	Mugilidae	Grey mullet	Godaya
	Sillaginidae	Whiting	Kalanda
	Lactariidae	White fish	Pullunna
	Carangidae	Horse Mackerel	Parati
	Ephippidae	Spade Fish	Hada
	Drepanidae	Spotted Bat Fish	Handeya
	Mullidae	Mullet	Nagaraya
	Stromateidae	Pomfret	Vauvalaya
Prawns & others	Penaeidae	Prawns	Issa
	Panuliridae	Lobsters	Pokirissa
	Portinudae	Swimming crab	Moodhu Kakuluwa
	Scyllaridae	Lagoon crab	Kalapukakuluwa
	Loliginidae	Squid	Dhalla
	Sepiidae	Cuttle fish	Pothu Dhalla
	Octopoda	octopus	Boovalla

* These varieties are caught by shore seines as well as small-mesh gillnets.

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Appendix 5.2

COMPOSITION OF TOTAL MARINE FISH LANDINGS (1977-1981)

(In tonnes)

Species group	**1977**	1978	1979	1980	1981
Seer	3715	3656	4583	6152	4490
Paraw	8653	10196	10125	10129	10401
Blood Fish	23159	23405	22392	27830	32307
Sharks	6499	7716	7868	8355	9700
Skates	4636	4657	4953	5910	11233
Rock Fish	15640	17597	18787	16553	18517
Shore seine varieties . .	54591	61188	71597	81697	76176
Prawns	3864	4814	3349	3250	5177
Others	2958	4418	4919	4919	6461
Total	123715	137647	148573	164775	174462

Source: Ministry of Fisheries.

Appendix 5.3

COMPOSITION OF MARINE FISH LANDINGS IN THE COASTAL FISHERY BY DIFFERENT TYPES OF CRAFT (1981)

(In tonnes)

Species group	39 ton boats	Outboard mechanised craft	Non-mechanised craft*	Total
Seer	2594	1110	766	4470
Paraw	5339	2708	2115	10162
Blood fish	24530	5553	2224	32307
Shark	7344	1716	579	9639
Skate	3609	6333	1059	10998
Rock fish	3573	7004	6669	**17246**
Shark Seine	5348	37606	33174	76128
Prawns	1893	643	1939	5175
Others	1334	1807	3752	6193
Total	55564	64480	52274	172318

* Includes shore seines and gears without craft.

Source: Ministry of Fisheries.

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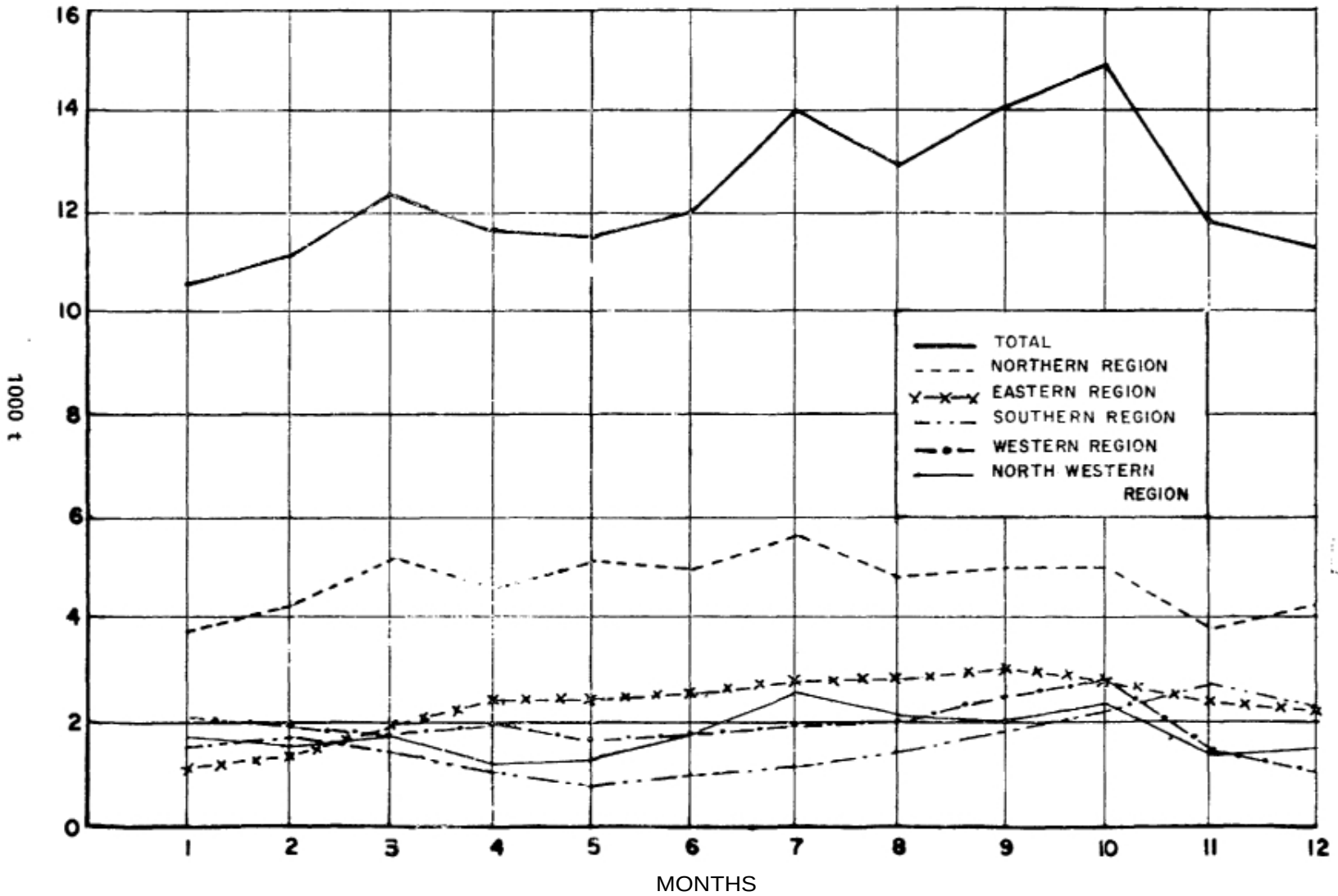
Appendix 5.4

MONTHLY AVERAGE CATCHES IN THE COASTAL FISHERY BY REGION (1977-81)



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Appendix 5.5

FISH PRODUCTION IN THE COASTAL DISTRICTS IN 1981

(in tonnes)

District	Seer	Paraw	Blood fish	Shark	Skate	Rock fish	Shore Seine	Prawns	Others	Tota l	%
Colombo	94	450	277	2	1	263	90	189	2	1368	0.8
Kalutara	56	274	3090	140	95	490	926	45	153	5269	3.1
Galle	490	545	5987	63	20	672	461	-	305	8543	5.0
Matara	21	353	5440	264	48	594	2144	-	235	9099	5.3
Tangalle	133	88	1821	232	262	354	2588	-	81	5561	3.2
Kalmunai	411	66	2200	377	174	381	4666	-	177	8450	4.9
Batticaloa	271	290	2017	404	129	294	4342	111	840	8698	5.0
Trincomalee	721	1809	2823	1182	754	2563	3464	139	270	13725	8.0
Mullativu	368	113	329	168	10	857	7892	546	746	11029	6.4
Jaffna	821	4116	588	2902	4624	6717	20046	1720	1573	43107	25.0
Mannar	113	705	473	1137	2716	1303	5165	711	645	12968	7.5
Puttalam	499	937	3125	620	1381	1496	5296	401	852	14601	8.5
Chilaw	111	118	78	42	228	781	8608	495	112	10573	6.1
Gampaha	361	298	4059	2106	556	481	10446	818	202	19327	11.2
Total	4470	10162	32307	9639	10998	17246	76128	5175	6193	172318	100.0
%	2.6	5.8	18.8	5.6	6.4	10.0	44.2	3.0	3.6		

Source: Ministry of Fisheries.

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Appendix 8.1

FISH EXPORTS (1977-1981)

Quantity in (t) *Value F. 0.8.: (Rs. million)*

Item	1977		1978		1979		1980		1981	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
Ornamental fish	174.7	3.171	466.9	21.536	247.8	12.911	181.2	18.412	136.8	30.573
Shrimp	1281.3	51.638	1937.1	158.254	2321 .1	243.978	1706.4	182.633	2139.4	257.823
Lobster	385.6	31.612	271.7	37.342	127.0	14.861	147.3	15.942	165.2	25.595
Other crustaceans and molluscs ..	93.2	2.526	—	—	240.3	17.326	140.9	7.997	98.2	6.269
Shark fins and fish maws	59.7	3.877	326.7	8.879	49.3	8.727	52.7	11.267	39.5	10.487
Beche-de-mer	50.6	1.727	67.6	6.449	60.5	6.728	77.5	10.814	71.6	13.930
Chanks and shells	30.9	0.238	58.0	0.587	129.8	2.043	91.8	2.855	100.4	2.223
Others	N.A.	0.017	—	—	895.6	0.433	—	—	8.8	1.332
Total	2076.0	94.806	3128.0	233.047	4071.4	307.007	2397.8	249.920	2759.9	348.412

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Appendix 8.2

FISH IMPORTS (1977-1981)

Quantity in (t) *Value C.I.F.: (Rs. million)*

Item	1977		1978		1979		1980		1981	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
Maldive fish	659.8	3.889	232.3	2.172	130.0	2.137	231.2	4.307	95.3	1.309
Dried fish	2701.3	5.778	2981.4	17.902	6643.3	60.097	11260.9	133.136	3857.6	56.186
Prepared/preserved fish	1766.1	9.957	1827.0	12.674	11699.2	129.331	10545.0	153.456	3142.0	50.122
Others	9.6	0.228	72.2	1.185	22.2	0.531	347.5	7.044	77.2	1.186
Total	5136.8	19.852	5112.9	33.933	18494.7	192.096	22384.6	297.943	7172.1	108.803

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Appendix 10.1

DISTRIBUTION OF FISHERMEN (1981)*

DFEO Divisions	No. of fishing villages	No. of fishermen
North- Western Region		
Puttalam / Chilaw	132	13,878
Western Region		
Negombo	23	6,660
Colombo	25	1,798
Kalutara	58	2,621
Southern Region		
Galle	231	4,007
Matara	53	3,777
I-lambantota	91	2,201
Eastern Region		
Kalmunai	45	7,501
Batticaloa	91	7,582
Trincomalee	61	4,030
Northern Region		
Mullaitivu	20	1,932
Jaff na	107	12,710
Mannar	32	3,770
Total	969	72,467

Source: Ministry of Fisheries.

* Estimated using 1972 fisheries census data and the annual rate of population increase.

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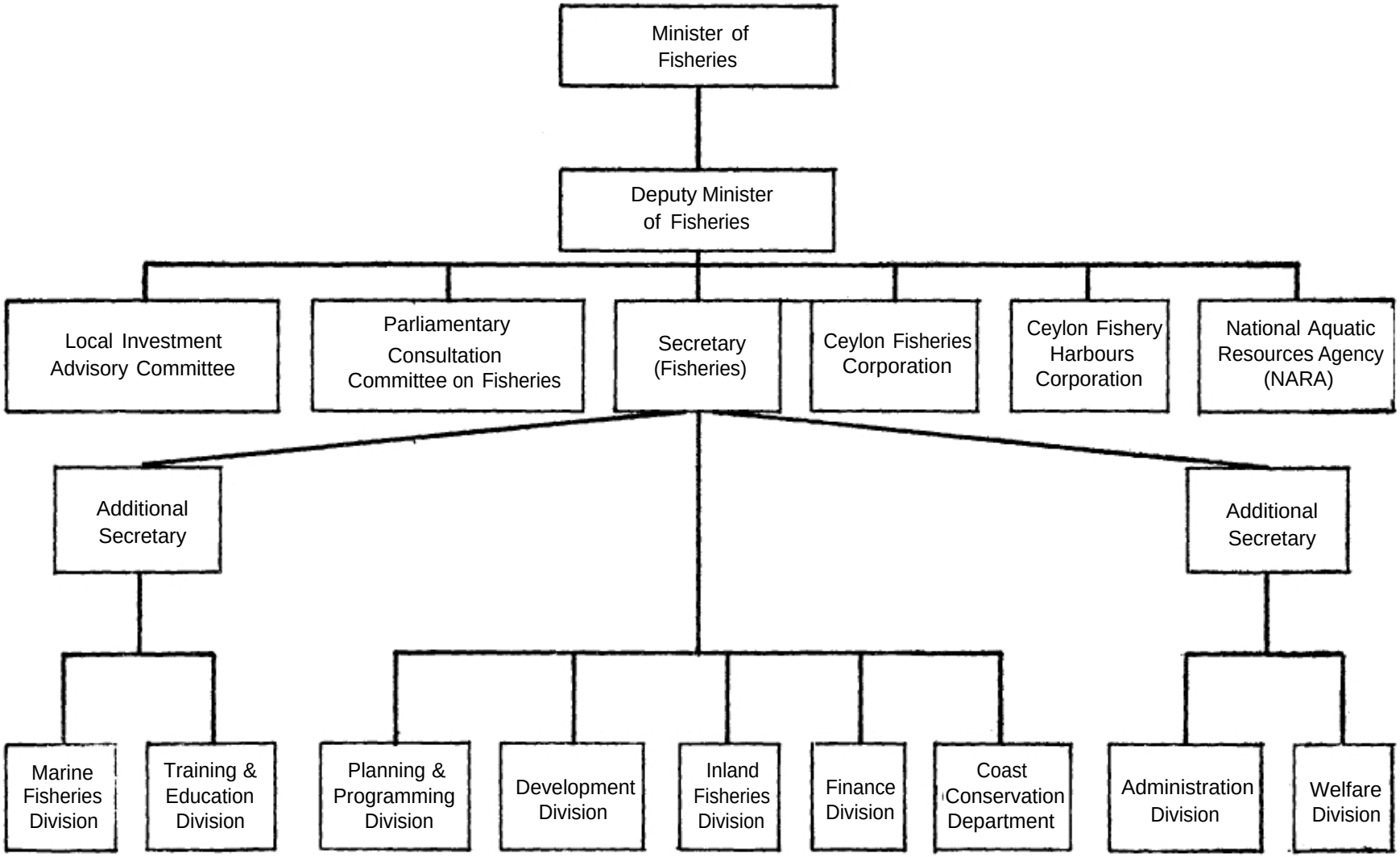
Appendix 11.1

ORGANISATIONAL SET-UP OF THE FISHERIES ADMINISTRATION



Appendix 11.2

SUMMARY BUDGET OF THE MINISTRY OF FISHERIES FOR 1982

Programme	Estimate 1982 Rs.
Recurrent Expenditure:	
General administration and staff services	10,392,000
Regulation and development of fisheries	***15.258.000***
Coast conservation	1,450,000
Total recurrent expenditure	***27,100,000***
Capital Expenditure:	
* General administration and staff services	***108,575,000***
Regulation and development of fisheries	***57,057,000***
Coast conservation	***8,500,000***
Total capital expenditure	***174,132,000***
Total ***Expenditure:***	
* General administration and staff services	118,967,000
Regulation and development of fisheries	***72,315,000***
Coast conservation	9,950,000
Total Expenditure	***201,232,000***

*Includes Rs. 3,000,000 and Rs. 15,000,000 as contributions to the capital of Ceylon Fisheries Corporation and Ceylon Fishery Harbours Corporation respectively.

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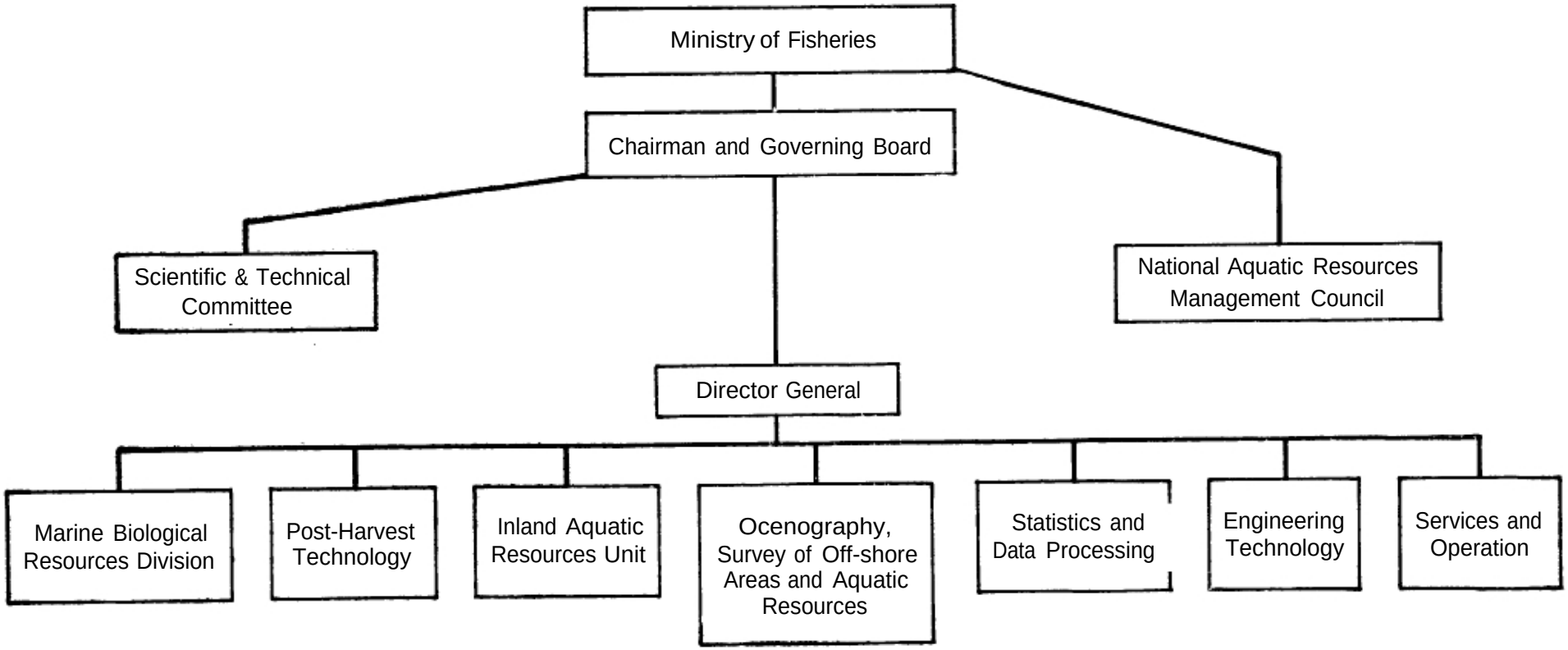
Appendix **11.3**

ORGANISATJONAL SET-UP OF THE NATIONAL AQUATIC RESOURCES AGENCY



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Appendix 13.1

SUBSIDIES FOR PURCHASE OF FISHING CRAFT, ENGINES AND FISHING GEAR

Scheme	Type of craft/engine	Subsidies (per cent of total costs)
1. Outright purchase scheme	17-23 ft FRP boats	35[1]
	28-32 ft boats	35[1]
	32-40 ft boats	35[3]
	Inboard engines	50
	Outboard motors	50
	Non-mechanised craft	90[2]
2. Cooperative scheme	17-23 ft boats	50[1]
	28-32 ft boats	50[1]
	Non-mechanised craft	90[2]
3. Sail subsidy	All craft	70[4]
4. Self-employment bank finance scheme	17-23 ft boats	35[1]
	28-32 ft boats	35[1]

1 On total costs of hull, engine and fishing gear.
2 On total costs of hull and fishing gear.
3 On total costs of hull and engine only.
4 On costs of sails only.

Appendix 13.2

SUBSIDIES FOR INLAND FISHERMEN AND FISH FARMERS

Nature of subsidized activity	*Rate of subsidy*
1. Construction of new ponds Improvements to existing ponds Erection of ancillary structures Purchase of equipment Purchase of seed, feed, fertilizer	50% of the total cost, subject to maxima based on the extent of the pond, ranging from Rs. 2,000 for an extent of 1/16 acre to Rs. 10,000 for an extent of 2 acres.
2. Purchase of boat and fishing gear for use in inland fishing.	90% of the total cost.

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Appendix 13.3

INCENTIVES AND CONCESSIONS FOR INVESTORS IN THE FISHERIES SECTOR

1. Tax holiday

Under Section 17 of the Inland Revenue Act No. 28 of 1979, the profits and income of any company incorporated after 15-11-1977 engaged in carrying on one or more of the following undertakings, shall be exempt from income-tax for the period commencing from the date of incorporation of that company and ending on March 31, 1983.

(i) an undertaking for offshore or deep-sea fishing
(ii) an undertaking for carrying on offshore and deep-sea fishing and processing of its products
(iii) an undertaking for building of fishing boats or for manufacture of fishing gear or for assembly of marine engines
(iv) an undertaking for the manufacture of ice or provision of cold storage rooms.

2. Exemption from income tax on profits and income from exports

Under section 20 of the Inland Revenue Act No. 28 of 1979, the profits and income of the company arising from the export of fish products, fish nets, etc. shall be exempt from income tax, if approved by the Ministry of Finance. This relief is available for a period of 5 years from the date on which the Company made its first exports in the case of companies incorporated on or after April 1, 1972, and approved by the Ministry after November 15, 1978.

3. Dividends from investments approved for tax holiday

Under Section II of the Inland Revenue Act No. 28 of 1979, any dividend paid to shareholders of a company out of profits and income of that company arising during the tax holiday period or within one year thereafter will be exempt from income tax.

4. Investment relief

Amounts equivalent to investments in shares made in projects approved in terms of Section 31 of the Act can be deducted by a person from his assessable income provided such deductions together with all other deduction allowed under Section 31 should not exceed 1/3 of his total assessable income.

5. Deduction of capital expenditure

The full *cost* of

(i) any implement or equipment for any undertaking of offshore or deep-sea fishing
(ii) construction of tanks and ponds
(iii) clearing and preparation of inland waters for the purpose of rearing fish in
(iv) the purchase of fish to be reared in such tanks, ponds or inland waters is deductible from profits.

6. Exemption from income tax of subsidy

In terms of Section 13 of the Inland Revenue Act No. 28 of 1979, any sum paid to any person as a subsidy or grant by the Ministry of Fisheries for the purchase of fishing boats, marine engines, fishing gear and other fishing equipment for offshore or deep-sea fishing will be exempt from income-tax.

7. Customs duty

Most of the inputs required for fishing, such as nets, twine, engines and engine spares can be imported either free of duty or on low rates of duty. Low rates of duty also apply to raw materials for manufacture of boats, net and gear and for equipment such as ice plants, net-making machines, etc.

Source: Ministry of Fisheries brochure "Investment Opportunities in the Fisheries Sector."

Appendix 14.1

BOAT INTRODUCTION PROGRAMME FOR THE COASTAL FISHERY (1979-83)

	1979	**1980**	1981	1982	1983
28-32 foot boats					
1. No. of boats at year beginning	2240	2305	2505	**2619**	2751
2. No. of boats going out during year	285	200	286	268	127
3. No. of boats introduced during year	350	400	400	400	400
4. Total boats end year	2305	2505	2619	2753	3026
17-24 foot FRP boats					
5. No. of boats at year beginning	2850	3250	3750	4250	4750
6. No. of engines replaced during year	150	250	360	660	610
7. No. of boats introduced during year	400	500	500	500	500
8. Total boats end year	3250	3750	4250	4750	5250
Indigenous mechanised boats					
9. Total boats at year beginning	3150	4290	4750	4900	5080
10. No. of engines replaced	160	290	410	740	690
11. No. of engines issued	1300	750	640	840	890
12. No. of craft mechanised during year	1140	460	230	100	200
Non-mechanised indigenous craft					
13. No. of boats at year beginning	13800	13230	13000	12885	12835
14. No. of boats mechanised during year	1140	460	230	**100**	200
15. Total boats end year	13230	13000	12885	12835	**12735**

Source: Master Plan for the development of fisheries in Sri Lanka, 1979-83.

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Appendix 14.2

ESTIMATED FISH OUTPUT FOR COASTAL FISHING VESSELS (1979-83)

		1979	1980	1981	1982	1983
3½ ton boats						
Catch per boat (t)		21	22	22	22	22
Operating craft	(No.)	2,273	2,405	2,562	2,685	22,888
output	(t)	47,733	52,910	56,364	59,070	63,536
17-24 *foot boats*						
Catch per boat		11	12	12	12	12
Operating craft	(No.)	3,050	3,500	4,000	4,500	5,000
output	(t)	33,550	42,000	48,000	54,000	60,000
Indigenous mechanised craft						
Catch per boat (t)		7.5	8	8	8	8
Operating craft	(No.)	3,720	4,520	4,865	5,030	5,180
output	(t)	27,900	36,160	38,920	40,240	41,440
Non-mechanised craft including craft operating beach seines						
Catch per boat (t)		3.5	4	4	4	4
Operating craft	(No.)	13,315	13,115	12,943	12,860	12,785
output	(t)	57,303	52,460	51,772	51,440	51,140
Total ouput		156,486	183,530	195,056	204,750	216,116

Source: Master Plan for the development of fisheries in Sri Lanka, 1979-83.

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Appendix 14.3

ESTIMATED FISH OUTPUT FOR OFFSHORE FISHING VESSELS (1978-83)

			1978	1979	1980	1981	1982	1983
1.	***ADB S. W. Coast Project***							
	38 foot FRP boats	Average no. operating	18	30	30	30	30	30
		output (t)	1,634	2,724	2,724	2,724	2,724	2,724
2.	***Abu Dhabi N. W. Coast Project***							
	(a) 34 foot trawlers	Average no. operating	—	—	15	40	50	50
		output (t)		—	1,605	4,280	5,350	5,350
	(b) 34 foot driftnetter	Average no. operating	—	—	2.5	15	37.5	50
		output (t)	—	—	225	1,350	3,375	4,500
	(c) 34 foot combination	Average no. operating	—	—	2.5	15	37.5	50
		output (t)	—	—	290	1,740	4,350	5,800
	(d) 50 foot combination	Average no. operating	—	—	1	2	2	2
		output (t)	—	—	217	434	434	434
3.	***Netherlands E. Coast Project***							
	33 foot driftnetter	Average no. operating	—	—	5	20	30	30
		output (t)	—	—	350	1,400	2,100	2,100
4.	***Ce y-Nor project fleet and other boats of 38-65 feet built by Ce y-Nor***	Average no. operating	7	9	13	17.5	23	29
		output (t)	1,080	1,600	20	3,725	4,855	5,985
5.	***W. Coast Project***							
	(a) 34 foot combination	Average no. operating	—	—	—	20	50	50
		output (t)	—	—	—	1,800	4,500	4,500
	(b) 50 foot combination	Average no. operating	—	—	—	1	2	2
		output (t)	—	—	—	217	434	434
6.	***Deep-sea tuna fishing project***							
		Average no. operating	—	—	—	—	2	5
		output (t)	—	—	—	—	980	2,450
7.	TOTAL OUTPUT ALL VESSELS	(t)	2,714	4,324	8,051	17,670	29,102	34,277

Source: Master Plan for the development of fisheries in Sri Lanka, 1979-83

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Appendix 14.4

TOTAL CAPITAL COSTS OF THE INVESTMENT PROGRAMME OF THE MASTER PLAN FOR DEVELOPMENT OF FISHERIES (1979-83) AT 1979 COSTS *(Rs.million)*

		1979	1980	1981	1982	1983	1979-83
1. Coastal fishery							
(boats, engines, gear)	T	85.8	83.1	81.6	80.3	81.8	412.6
	F	61.3	59.9	55.6	52.5	53.0	282.3
	L	2.45	23.2	26.0	27.8	28.8	130.3
2. Offshore							
(boats, engines)	T	15.8	34.5	66.0	48.1	9.8	174.2
	F	13.2	22.4	42.9	31.3	6.4	116.2
	L	2.6	12.1	23.1	16.8	3.4	58.0
3. Fishing gear and							
yarn imports	T	88.0	53.5	7.5	—	—	149.0
	F	88.0	53.5	7.5	—	—	149.0
	L	—	—	—	—	—	—
4. Fishing gear factories	T	17.0	34.0	17.0	—	—	68.0
	F	14.4	28.8	14.4	—	—	57.6
	L	2.6	5.2	2.6	—	—	10.4
5. Engine spares	T	21.8	24.4	27.9	30.5	32.7	137.3
	F	21.8	24.4	27.9	30.5	32.7	137.3
	L	—	—	—	—	—	—
6. Ice plants and							
cold stores 1	T	53.0	61 .O	12.0	12.0	—	138.0
	F	34.4	39.7	7.8	7.8	—	89.7
	L	18.6	21.3	4.2	4.2	—	48.3
7. Harbours	T	20.0	34.9	93.3	55.0	30.0	233.2
	F	13.8	15.2	39.0	20.0	8.0	96.0
	L	6.2	19.7	54.3	35.0	22.0	137.2
8. C.F.C.	T	18.3	14.6	28.8	16.8	14.0	92.5
	F	12.8	9.9	16.4	8.6	8.0	55.7
	L	5.5	4.7	12.4	8.2	6.0	36.8
9. Fishing Technology							
Institute	T	4.3	5.9	4.0	4.0	4.0	22.2
	F	3.9	5.3	3.0	3.0	3.0	18.2
	L	0.4	0.6	1.0	1.0	1.0	4.0
10. Fishing							
Technology Unit	T	—	8.0	7.0	5.5	4.5	25.0
	F	—	6.7	5.8	4.3	3.3	20.1
	L	—	1.3	1.2	1.2	1.2	4.9
11. Repair facilities	T	—	5.0	0.1	—	—	5.1
	F	—	4.6	—	—	—	3.6
	L	—	1.4	0.1	—	—	1.5

12. Marine research	T	3.2	9.5	4.3	2.9	0.5	20.4
	F	2.8	8.4	3.8	2.4	—	17.4
	L	0.4	1.1	0.5	0.5	0.5	3.0
13. Fishermen's welfare	T	—	44.7	41.2	41.9	41.2	169.0
	F	—	11.1	10.3	10.4	10.3	42.1
	L	—	33.6	30.9	31.5	30.9	126.9
14. Inland fisheries development and research	T	3.7	15.4	21.5	16.5	16.0	73.1
	F	2.0	8.4	20.5	14.4	13.6	58.9
	L	1.7	14.7	11.8	15.5	11.0	54.7
15. Inland fisheries subsidies	T	—	0.5	1.0	1.0	1.0	3.5
	F	—	—	—	—	—	—
	L	—	0.5	1.0	1.0	1.0	3.5
16. Deep-sea fishing	T	—	—	—	34.8	55.3	90.1
	F	—	—	—	26.3	42.3	68.6
	L	—	—	—	8.5	13.0	21.5
17. Fisheries training	T	—	26.8	—	—	—	26.8
	F	—	26.8	—	—	—	26.8
	L	—	—	—	—	—	—
18. Other on-going	T	15.6	1.4	0.4	0.4	0.4	18.2
	F	9.0	—	—	—	—	9.0
	L	6.6	1.4	0.4	0.4	0.4	9.2
Total	T	346.5	464.9	424.4	363.1	299.8	1898.7
	F	277.4	324.1	254.9	211.5	180.6	1248.5
	L	69.1	140.8	169.5	151.6	119.2	650.2

NOTES:

1. These estimates are subject to some revision and change especially where full details of the investment programmes have not been calculated. (Harbours, CFC, Fish Technology institute and Training.)

2. The estimates do not include capital costs of new improved administration and management units other than those which will be introduced with foreign technical assistance.

T = Total F = Foreign costs L = Local costs.

Source: Master Plan for the development of fisheries in Sri Lanka, 1979-83.

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Appendix 14.5

EXTERNALLY FUNDED FISHERIES PROJECTS IN SRI LANKA

A. *Technical Assistance*

1. FAO/UNDP (inter-regional)	**Tuna Resources Development and Management in Indo-Pacific – INT/81/034.** **— Establishment of information base as foundation for development and management of tuna and tuna-like fisheries.**	**Started : 1982** **Duration : 5 years** **Host government : Sri Lanka**
2. FAO/SI DA (regional)	**Development of Smail-Scale Fisheries in the Bay of Bengal — GCP/RAS/040/ SWE (Bangladesh, India, Malaysia, Sri Lanka and Thailand).** **— assistance to participating countries for improving the quality of life of their small-scale fisherfolk families and for increasing the supplies of fish.**	**Started : 1979** **Duration : 8 years** **Host governments : India & Sri Lanka**
3. FAO/UNDP (regional)	**Marine Fishery Resources Management in the Bay of Bengal — RAS/81/051 (Bangladesh, India, Indonesia, Malaysia Maldives, Sri Lanka and Thailand)** **— improvement of national capabilities to plan and implement fishery development and management programmes.**	**Started : 1983** **Duration : 4 years** **Host government: Sri Lanka**
4. FAO/UNDP	**Aquaculture Development & Training SRI-/79/023** **— augmentation of fish seed production facilities** **— establishment of an aquaculture demonstration and training centre for freshwater and brackishwater fish farming.**	**Started : 1981** **Duration : 3 years** ***Budget (Rs. million)*** **UNDP** 15.40 **Sri Lanka** 21.70 37.10
5. International Development Research Centre (IDRC), Canada	**Cage culture Project Phase II** **— determination of the feasibility of finfish cage culture in inland waters.**	**Started : 1981** **Duration : 18 months** ***Budget (Rs. million)*** **IDRC** 3.30 **Sri Lanka** 2.10 5.40
6. CIDA	**Aquaculture Development — Mahaweli System** **— promotion of aquaculture in seasonal tanks of system B of the Mahaweli Development Project.**	**Planned to start in 1984**

B. *Investment* Projects

1. Dutch Bilateral Aid	**East Coast Fishery Development project** **— construction of shore facilities at Valachchenai** **— introduction of coastal fishing vessels.**	**Started : 1980** **Duration : 3 years** ***Budget (Rs. million)*** **Netherlands 46.2** **Sri Lanka** 2.46 48.66

2. Abu Dhabi Fund for Arab Economic Development	N.W Coast Fishery Project — introduction of offshore fishing vessels of 34' and 50'. — provision of shore facilities.	Started : 1979 Duration : 5 years ***Budget (Rs. million)*** Abu Dhabi 111.6 Sri Lanka 60.0 171.6
3. Asian Development Bank	West Coast Fishery Project — introduction of coastal and offshore fishing boats — retrofitting of existing boats with sails -fitting propeller nozzles to existing boats — provision of shore facilities — training of personnel.	Started : 1981 Duration : 4 years ***Budget (Rs. million)*** ADB 271.40 Sri Lanka 73.60 345.00
4. Asian Development Bank	Aquaculture Development Project -to establish base for shrimp culture -to strengthen the institutional infrastructure for the future development of aquaculture in Sri Lanka -to increase inland fish production for domestic consumption	Planned to start in 1984 ***Budget (Rs. million)*** ADB 193.10 Sri Lanka 233.58 426.68
5 . NORAD	Hambantota District Integrated Rural Development Project — includes a fisheries component to provide infrastructure facilities and exploratory fishing.	Started : 1981 Duration : 5 years
6. World Bank	Puttalam District Integrated Rural Development Fishery Project — includes a fisheries component to provide infrastructure facilities.	Started : 1981 Duration : 3 years

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Publications of the Bay of Bengal Programme (BOBP)

Development of Small-Scale Fisheries (GCP/RAS/040/SWE)

Reports *(BOBP/REP/.. . .)*

1. **Report of the First Meeting of the Advisory Committee. Colombo, Sri Lanka, 28-29 October 1976. (Published as Appendix 1 of IOFC/DEV/78/44.1, FAO, Rome, 1978)**

2. **Report of the Second Meeting of the Advisory Committee. Madras, India, 29-30 June 1977. (Published as Appendix 2 of IOFC/DEV/78/44.1, FAO, Rome, 1978)**

3. **Report of the Third Meeting of the Advisory Committee. Chittagong, Bangladesh, 1-10 November 1978. Colombo, Sri Lanka, 1978. (Reissued Madras, India, September 1980)**

4. **Role of Women in Small-Scale Fisheries of the Bay of Bengal. Madras, India, October 1980.**

5. **Report of the Workshop on Social Feasibility in Small-Scale Fisheries Development. Madras, India. 3-8 September 1979. Madras, India, April 1980.**

6. **Report of the Workshop on Extension Service Requirements in Small-Scale Fisheries. Colombo, Sri Lanka, 8-12 October 1979. Madras, India, June 1980.**

7. **Report of the Fourth Meeting of the Advisory Committee. Phuket, Thailand, 27-30 November 1979. Madras, India, February 1980.**

8. **Pre-Feasibility Study of a Floating Fish Receiving and Distribution Unit for Dubla Char, Bangladesh. G. Eddie, M. T. Nathan. Madras, India, April 1980.**

9. **Report of the Training Course for Fish Marketing Personnel of Tamil Nadu. Madras, India, 3-14 December 1979. Madras, India, September 1980.**

10.1 **Report of the Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal. Chittagong, Bangladesh, 16-21 June 1980. Volume 1 : Proceedings. Madras, India, September 1980.**

10.2 **Report of the Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal. Chittagong, Bangladesh, 16-21 June 1980. Volume 2 : Papers. Madras, India,** October 1980.

11. **Report of the Fifth Meeting of the Advisory Committee. Penang, Malaysia, 4-7 November 1980. Madras, India, January 1981.**

12. **Report of the Training Course for Fish Marketing Personnel of Andhra Pradesh. Hyderabad, India, 11-26 November 1980. Madras, India,** September 1981.

13. **Report of the Sixth Meeting of the Advisory Committee.** Colombo, **Sri Lanka, 1-5 December 1981. Madras, India, February 1982.**

14. **Report of the First Phase of the "Aquaculture Demonstration for Small-Scale Fisheries Development Project" in Phang Nga Province, Thailand. Madras, India, March 1982.**

15. Report of the Consultation-cum-Workshop on Development of Activities for Improvement of Coastal Fishing Families. Dacca, Bangladesh, October 27-November 6, 1981. Madras, India, May 1982.

16. Report of the Seventh Meeting of the Advisory Committee. New Delhi, India, January 17-21, 1983. Madras, India, March 1983.

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