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The country report of the Malaysia

Status of the Marine Fisheries with Assessments of Potential Yields from the Coastal Marine Fisheries Resources of Malaysia

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1. INTRODUCTION

In the presentation of the country report the marine fisheries of the coastal waters of the west and east coasts of West Malaysia are treated separately as the marine fisheries resources of the two coasts are quite distinct and the rates of growth of the fisheries dissimilar. The data utilised cover the period 1965 to 1971 for prior to 1965 detailed statistics of catch landings are not available and there was little if any trawling.

The data on catch landings are considered under two groups, the major group comprising the demersal and semi-pelagic species, pelagic schooling species such as chub mackerel, anchovies, tunas, sardine and herrings, trevally, round scad and yellow banded scad, prawns and the minor group comprising shrimps, crabs squids and cuttle-fish, bivalves and other molluscs. The description of the status of the marine fisheries and the assessments of the potential yields are based mainly on the major group.

2. STATUS OF MARINE FISHERIES

2.1 West coast (Table I, Figure I)

Total marine fisheries landings increased insignificantly during the years prior to 1965 but thereafter increased rapidly at an accelerated rate to a peak in 1968 of 278,151 tons, declined through 1969 and 1970 to 230,539 tons and recovered somewhat in 1971 to 249,147 tons. The trends shown were due partly to the additional landings of demersal and semi-pelagic species following the introduction and expansion of trawling since 1965 but mainly to the exceptional abundance of *Rastrelliger spp.* in the coastal waters during 1967 and 1968. The trends shown by the major and minor groups were as follows:

2.1.1 Demersal and semi-pelagic species.

Landings of this group increased from 63,826 tons in 1965 to 102,355 tons in 1968, decreased to 83,605 tons in 1970 and increased to 96,214 tons in 1971. The contribution by trawlers increased from 17 percent in 1965 to 63 percent in 1971 whilst the contribution by traditional gears decreased from 83 percent in 1965 to 37 percent in 1971.

2.1.2 Pelagic schooling species.

Landings of this group increased from 29,839 tons in 1965 to 115,759 tons in 1968, decreased to 68,527 tons in

1970 with the 1971 landings just slightly higher at 70,120 tons. The landings of this group were greatly influenced by the landings of *Rastrelliger spp.* which increased from 8,598 tons in 1965 to 89,507 tons in 1968, the highest ever recorded for these species. The landing in 1971 increased somewhat over 1970 to 33,394 tons.

The landings of the other species of the group, on the other hand, increased from 21,241 tons in 1965 to 38,884 tons in 1970 but decreased slightly to 36,726 tons in 1971.

2.1.3 Prawns

Landings of prawns which were of the same order during 1965 and 1966, 13,191 tons and 13,797 tons respectively, increased at a greater rate thereafter as more and more trawlers switched over to prawns the following years. In 1971 total prawn landing was 45,934 tons with

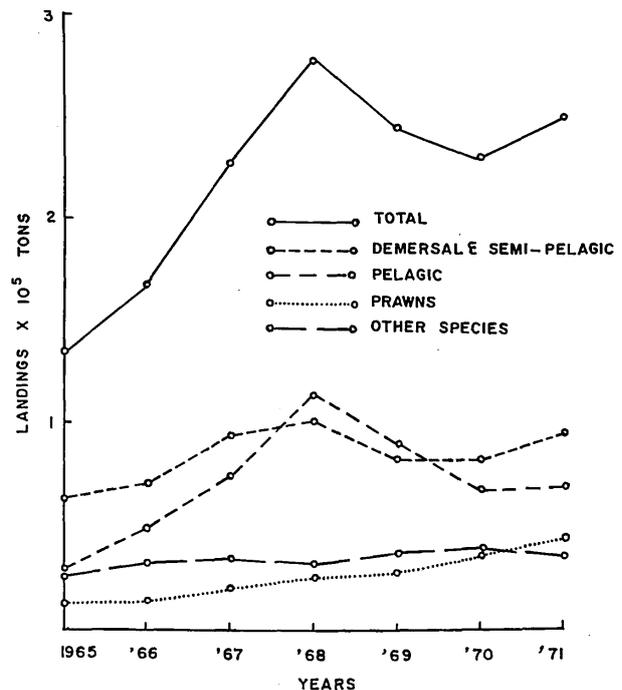


Fig. 1 Trends of marine fisheries landings, 1965 - 1971 on the west coast.

Table I

West Coast

Marine fisheries landings, 1965 – 1971, on the west coast of West Malaysia

	1965	1966	1967	1968	1969	1970	1971
1. Total	133,134	166,668	226,690	278,151	243,620	230,539	249,147
2. Demersal & semi-pelagic	63,826	71,510	94,751	102,355	84,000	83,605	96,214
2.1. By trawlers	11,061	21,450	53,577	47,257	37,636	43,191	60,951
2.2 Traditional gears	52,765	50,060	41,174	55,098	46,364	40,414	35,263
3. Pelagic	29,839	49,274	75,504	115,759	91,041	68,527	70,120
3.1. <i>Rastrelliger</i> spp.	8,598	18,800	49,907	89,507	56,367	28,643	33,394
3.2. Other spp.	21,241	30,474	25,597	26,252	34,674	38,884	36,762
4. Prawns	13,194	13,797	21,573	26,276	29,652	37,544	45,934
4.1. By trawlers	—	—	—	9,260	9,167	22,405	30,612
4.2. Traditional gears	13,194	13,797	21,573	17,016	20,485	15,139	15,322
5. Shrimps	4,557	5,450	5,711	3,336	6,753	5,305	4,805
6. Crabs	1,408	1,603	1,674	2,033	2,436	1,652	1,457
7. Squid & Cuttlefish	366	508	697	1,401	1,342	2,085	1,718
8. Bivalve	19,070	24,086	26,426	26,546	27,786	31,159	28,168
9. Other molluscs	874	440	354	445	610	662	731

the trawlers contributing 30,612 tons, twice that of traditional gear. Traditional gear landing reached a peak 20,485 tons in 1969 but the landings in 1970 and 1971, just over 15,000 tons, were only slightly greater than the 1965, 1966 landings. (The 1967 landing by traditional gear includes landing by trawlers).

2.1.4 Minor groups.

The most important in this group is the bivalve, *Anadara granosa*, cultured on estuarine and coastal mud-flats. Landings increased from 19,020 tons in 1965 to 31,159 tons in 1970. In 1971 it decreased somewhat to 28,168 tons. Next in importance are the shrimps, *Acetes* spp, which increased from 4,557 in 1965 to 6,753 tons in 1969 and decreased to 4,805 tons in 1971. Crabs increased from 1,408 tons in 1965 to 2,436 tons in 1969 but decreased to 1,457 tons in 1971. Squid and cuttlefish showed a similar trend, increasing from 366 tons in 1965 to 2,085 tons in 1970 but decreasing to 1,718 tons in 1971. The greater part, over 95 percent of the landing, of squid and cuttlefish is by trawlers. The other molluscs decreased after 1965 when 874 tons were landed but recovered gradually to 731 tons in 1971.

2.2 East coast (Table II, Figure II)

Total marine landings remained more or less stagnant throughout the period 1965 to 1971. Landings increased from 65,243 tons to 75,166 tons in 1968, decreased to 54,220 tons in 1969 and increased again to 68,826 tons in 1971. The trends shown by the major group, the minor group's contribution being negligible, were as follows:

2.2.1 Demersal and semi-pelagic species.

Landings of this group increased from 23,959 tons in 1965 to 35,102 tons in 1971 with some fluctuations during the intervening years. The increase was primarily due to the development of trawling, at a modest rate during the earlier years and at a more rapid rate during the latter years of the period. Landings by trawlers increased from 1,967 tons in 1965 to 16,555 tons in 1971 whilst landings by traditional gear decreased from around 29,000

tons in 1966, 1967 to 18,548 tons in 1971. This decrease was due not to the reduction in the resource but to the decline in the amount of traditional fishing gear for reasons unknown.

2.2.2 Pelagic schooling species.

Landings of this group decreased from 37,562 tons in 1965 to 24,556 in 1970 but increased to 28,298 tons in 1971. Again, as for the demersal and semi-pelagic species, the decrease is attributed to the decrease in the amount of traditional fishing gear. *Rastrelliger* spp. decreased from 10,144 tons in 1965 to 4,756 tons in 1971 whilst the other species decreased from 27,418 tons in 1965 to

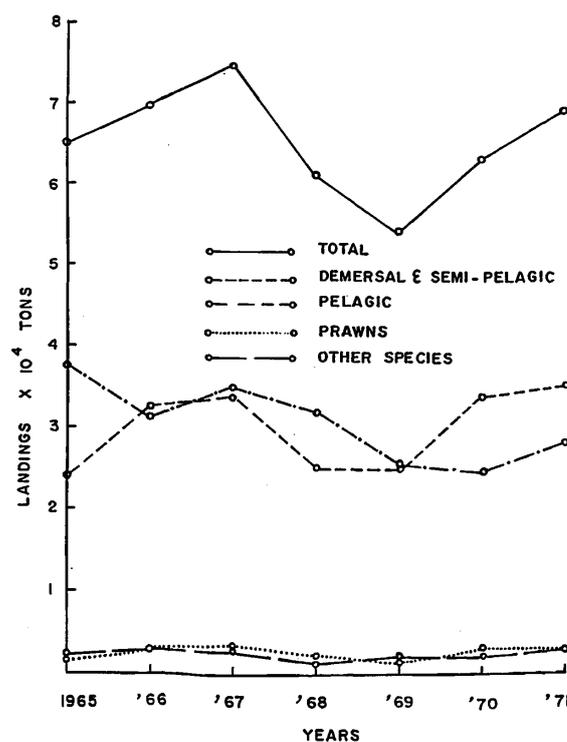


Fig. 2 Trends of marine fisheries landings, 1965 – 1971 on the east coast.

Table II

East Coast

Marine Fisheries Landings, 1965 – 1971, on the East Coast of West Malaysia

	1965	1966	1967	1968	1969	1970	1971
1. Total	65,243	69,939	75,166	61,331	54,220	63,757	68,826
2. Demersal & semi-pelagic	23,959	32,651	34,169	25,295	25,014	33,985	35,103
2.1. By trawlers	1,967	3,029	4,547	5,179	7,045	14,084	16,555
2.2. Traditional gears	21,992	29,622	29,622	20,116	17,969	19,901	18,548
3. Pelagic	37,562	31,386	34,597	31,964	25,484	24,556	28,298
3.1. Rastrelliger spp.	10,144	6,544	7,382	4,527	4,593	5,337	4,756
3.2. Other spp.	27,418	24,842	27,215	27,437	20,891	19,219	23,542
4. Prawns	1,598	2,987	3,425	2,481	1,628	3,120	2,535
4.1. By trawlers	—	—	—	1,397	723	2,092	1,800
4.2. Traditional gears	1,598	2,987	3,425	1,084	905	1,028	735
5. Shrimps	1,086	1,808	1,033	280	720	341	873
6. Crabs	106	343	542	116	111	433	153
7. Squid & Cuttlefish	832	757	1,400	1,195	1,263	1,322	1,864
8. Bivalve	—	—	—	—	—	—	—
9. Other molluscs	100	7	—	—	—	—	—

19,219 tons in 1970 but increased to 23,542 tons in 1971.

2.2.3 Prawns

Landings of prawns fluctuated between 1,500 tons to 3,500 tons with trawling contributing 50 per cent and more towards the landings. The fluctuations were due mainly to the effect of the prevailing conditions during the north east monsoon, when prawns are in season, on the trawling activity for prawns.

3. MAGNITUDE OF THE MARINE FISHERIES RESOURCES AND POTENTIAL YIELDS

The estimations of the magnitude of the marine fisheries resource and potential yields are difficult as catch and effort data in the present form are not altogether suitable and reliable for such estimates. Some reasonably good data available for the trawl fishery of the northern states on the west coast and the results of demersal trawl surveys are utilised together with observations on trends of the landings during the period and their density over the fished areas to arrive at some, hopefully, reasonable estimates.

3.1 West coast (Figure III)

3.1.1 Demersal and semi-pelagic species.

Estimate of maximum yield, using the surplus yield model, for the northern states for which some fairly reliable catch and effort data are available is 40,527 tons similar to the landing of 40,191 tons giving a yield per square nautical mile of 13.5 tons for waters up to a depth of about 50 meters, a figure slightly higher than Tiews 12.3 tons. The figure is probably on the high side as a mesh size of 1 inch and less is used in the cod end of the trawl nets. Nevertheless this figure is used in estimating the potential maximum yield for the northern states. For the southern states where trawling is just being developed the potential maximum yield is based solely on a potential yield of 3.8 tons per square nautical mile derived from a recent trawl

survey of the waters of the southern states.

A rough estimate of the maximum yield, using the surplus yield model, for the whole west coast is between 55,000 to 58,000 tons. The estimate using density figures of 13.5 tons per square nautical mile for the northern states and 3.8 tons per square nautical mile for the southern states is 59,136 tons, the two estimates being similar. These estimates do not include the semipelagic species only partially taken by trawlers. Landings of demersal and semi-pelagic species by traditional gears decreased after 1968 to 35,263 tons in 1971. It is unlikely that the landings will decrease below this figure as trawling

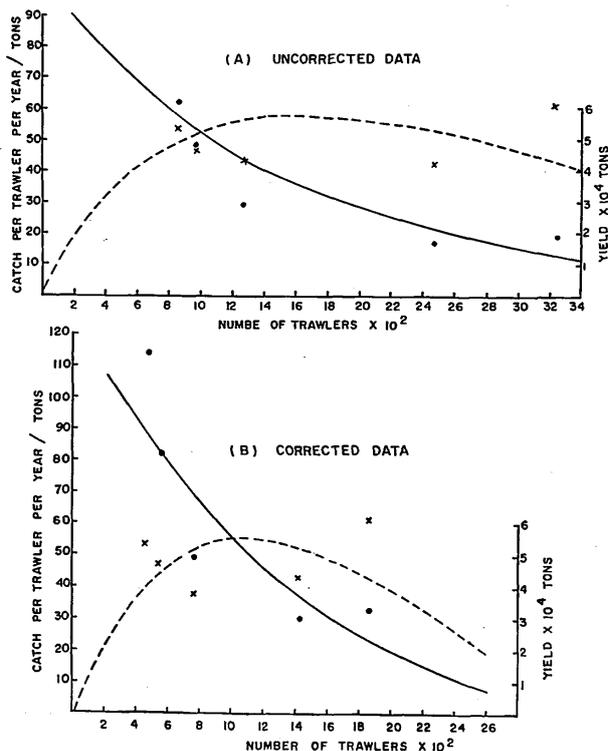


Fig. 3 Maximum yield driven from catch and effort data for the west coast.

is already well developed and is not likely to affect the landings of traditional gear appreciably. Nor, on the other hand, it is likely to increase further unless there is a change in the stock abundance of the species. If this figure of 35,263 tons is added to the estimates of 55,000 and 59,000 tons the total maximum yield will be in the range of 90,000 to 94,000 tons. The estimated range, though it does not differ significantly from the 1971 landing, could be high and should be reduced by some 10–20 per cent as the mesh size of the cod end of fish and shrimp trawls is 1 inch and less and the percentage of trash fish is high, about 50 percent for fish trawlers and between 64 to 84 percent for prawn trawlers. As a matter of interest an estimate of potential yield using Tiew's figure is about 80,000 tons, not significantly less than the estimate derived above, considering the reliability of the data used.

3.1.2 Pelagic schooling species.

There are no good data of catch and effort and the estimates made are based on trends during the period 1965 to 1971. *Rastrelliger spp*, the major pelagic species, had fluctuated 10-fold without any significant increase in effort from a maximum of 8,598 tons in 1965 to 89,507 tons in 1968. The best estimate of sustained yield would be the average of the landings over the period 1965 to 1971, some 41,000 tons. The other species, with the exception of the anchovies, are not fully exploited due mainly to the effect of trawling on the method of fishing carried out for these species. It is likely that landings of these species could be increased by a minimum of 5–10 percent over the landings of the last 3 years of the period to about 40,000 tons to give a total maximum yield of pelagic schooling species of about 81,000 tons.

3.1.3. Prawns.

As prawns have shown an increasing trend throughout the period it has not been possible to use catch and effort data to estimate maximum yield. Landings by trawlers in 1972, available for the northern states, increased in some states and decreased in others to give a net decrease of some 5,000 tons. It is therefore unlikely that prawns landed by trawlers will increase and even if they do they will most likely encroach on the landings by the traditional gear. Landings by traditional gear are not expected to increase in the face of competition by trawlers. It would appear that the landings are somewhat overestimated especially as landings were estimated proportionally to the gear operated. The maximum yield is probably in the region of 40,000 to 45,000 tons. This is somewhat higher than the 35,000 tons estimated by Gulland(FIRS/T97).

3.1.4 Minor groups

It is not expected that there will be any significant increase in the landings of the species comprising the minor group. Maximum yields estimated is between 38,000 to 40,000 tons.

3.2 East coast

3.2.1 Demersal and semi-pelagic species.

The estimate of potential yield is based on the results of 3 demersal trawl surveys carried out in depths ranging from about 10 meters to 50 meters. Assuming a 50 percent escapement of fish the estimate of standing stock is 161,000 tons. This would also be the maximum yield but

Table III

Average landings, 1971 landings and potential yields from marine fisheries

(a) West Coast

	Period averaged	Average landing	1971 landing	Potential yield
1. Demersal and semi-pelagic species	1967–1971	92	96	90–94
2. Pelagic schooling species	1965–1971	71	70	81
3. Prawns	1971	46	46	40–45
4. Other species	1969–1971	39	37	38–40
5. Total		248	249	249–260

(b) East Coast

1. Demersal and semi-pelagic species	1970–1971	30	35	95–130
2. Pelagic schooling species	1965–1971	31	28	56–75
3. Prawns	1965–1971	2.5	2.5	5–6
4. Other species	1965–1971	2.4	1.9	3–4
5. Total		65.9	67.4	159–215

because of the quality of the resource and its variable density with time it is not likely that the whole of the trawlable areas will be evenly exploited. As such a more reasonable estimate of maximum yield is between 80,000 to 120,000 tons. Landings by traditional gear decreased after 1967 to 18,548 tons in 1971. As trawling expands it is most likely that landings by traditional gear would be between 95,000 to 130,000 tons.

3.2.2 Pelagic schooling species

The highest landing recorded is 37,562 tons in 1965 when it was considered that the fisheries for the species were under developed. During the following years the landings declined but recovered somewhat in 1971. The anchovies declined the most due to the decrease in the number of beach seines following a change-over to other more productive traditional gear for other species. From reports and observations it appear that there are fairly substantial stocks of pelagic schooling species that could give a potential yield 1.5 to 2.0 times the landing of 1965, between 56,000 to 75,000 tons and perhaps even more, in the coastal waters if better and more efficient methods of fishing could be developed and or introduced.

3.2.3 Prawns

Landings depended partly on coastal semi-resident stocks which show seasonal variation and partly on migrant stocks which appear in the coastal water during the period of the northeast monsoon. Whilst the former stocks are fairly well exploited the latter stocks appear to be inefficiently exploited. As such, the potential yield possible is estimated to be around 5,000 to 6,000 tons.

3.2.4 Minor groups

It is unlikely that maximum yield will be greater than the landing of 2,590 tons in 1971 but more efficient methods of exploiting cephalopods could increase the maximum yield to between 3,000 to 4,000 tons.

3.3 Other areas

3.3.1 East Malaysia

An estimate of potential yield is made for demersal and semipelagic species only based on the results of a single demersal trawl survey in the coastal waters up to about 50 meters. The estimate is 183,000 tons but is more likely to be between 91,500 to 137,250 tons. The potential yield per square nautical mile of 10.6 tons is similar to that of the east coast of West Malaysia, 10.3 tons.

3.3.2 Deeper waters

(a) West coast of West Malaysia

In waters deeper than 50 meters the average catch rate of about 92.0 kg per hour was lower, about 64% of the

catch rate in waters shallower than 50 meters which are fairly well exploited, and with a potential yield of 3.0 tons per square nautical mile.

Unless very efficient gear, such as pair trawling, can be employed to exploit successfully this sparse resource it is not expected that major fishery can be developed.

(b) East coast of West Malaysia and East Malaysia

The estimate of potential yield is comprehensively dealt with by Shindo (IPFC/72/19) and as the average density is low, though in some areas it is higher than others, the problem of developing major fisheries for these demersal fish stocks is similar to the one discussed above for the west coast of West Malaysia.

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The country report of the Republic of the Philippines

Technical Seminar on South China Sea Fisheries Resources

by

The Philippine Bureau of Fisheries
Department of Agriculture and Natural Resources
Republic of the Philippines

1. INTRODUCTION

Since the inshore demersal and pelagic fisheries of the Philippines are already highly exploited, it is but timely that the country avail itself of the benefits that are expected to be derived from the South China Sea. Moreover, Kvaran (1971) noted that during the last twenty years, the landings from the marine fisheries have largely increased in the Southeast Asian Countries and more so in the Philippines so that the country is probably already harvesting a large percentage of its potential yield in its inland seas and territorial seas. Thus, the Philippine fisherman should be encouraged to expand fisheries, particularly the trawl fishery, into under-exploited international waters like the South China Sea.

It is envisioned that more knowledge would lead to an optimum utilization of the resources of the South China Sea.

This paper aims to give a picture of the status of the fisheries resources of the Philippines.

1.1 The Geographical Setting

The Philippine Archipelago situated in the outer rim of the Western Pacific is composed of 7,100 islands with a land area of 299,404 square kilometers. Eleven large islands make up more than ninety per cent of this area; only 45 islands have areas greater than 100 square kilometers, the largest being Luzon in the north and the second largest, Mindanao in the south. The major portion of the island group lies within an elongated ellipse extending north-northwest to south-southeast. Palawan and the Sulu Archipelago break away from this main body in a southwesterly direction toward Borneo to form the northwest and southwest boundaries of the Sulu Sea.

The whole Philippines is spread within a territorial¹⁾ area of about 1,965,700 square kilometers lying between latitudes 21°25'N and 4°23'N and longitude 116°00'E and 127°00'E. It is bounded on the east by the Pacific Ocean, on the south by the Celebes Sea and the coastal waters of Borneo, and on the west and north by the China Sea, which separates it from the Asiatic mainland.

The Philippines has limited continental shelves, the 200-meter isobar varying from 1 mile to about 60 miles in the Sulu Archipelago. In most parts of the archipelago it is just 31 to 45 miles from the shore.

A number of seas surround the islands, and these range from deep troughs and trenches to shallow basin and coral reefs. There are four deep regions of the marine area: one off east of Luzon up to the southeast of Taiwan (3000 fathom); another in the Sulu Sea (3,049); a third in the Celebes Sea (2786 fathom); and the fourth, the Philippines deep east of Samar and Mindanao (10,790 meters).

Philippine waters in relation to land area are extensive (about 5 times the land in surface area) but the insular shelves, the present seat of commercial fishing, are narrow and steep. Shallow waters with depths to 200 meters and up to about 165,000 square kilometers which are limited around the islands. Large portions of the shelf cannot be trawled due to the growth of coral reefs. Fishing for pelagic fish species takes place in shallow waters during strong monsoon winds and in most waters during calm weather.

From the standpoint of oceanography, the Philippine

1. Area as defined in the Treaty of Paris in 1898 between the United States of America and Spain.