1986

Management of Marine Fisheries Resources in Peninsular Malaysia

Abdul Jamal Mydin
University of Rhode Island

MANAGEMENT OF MARINE FISHERIES RESOURCES IN PENINSULAR MALAYSIA.

by

ABDUL JAMAL MYDIN

A MAJOR PAPER SUBMITTED IN PARTIAL
FULFILLMENT FOR THE DEGREE
OF MASTER OF MARINE AFFAIRS.

APPROVED: .....

(Professor Dennis W. Nixon)

DEPARTMENT OF MARINE AFFAIRS
UNIVERSITY OF RHODE ISLAND

I986.

ABSTRACT.

MANAGEMENT OF MARINE FISHERIES RESOURCES IN PENINSULAR MALAYSIA.

The inshore fisheries of Peninsular Malaysia are intensively exploited on the east coast and overexploited on the west coast. Fishing effort and investment need to be reduced, particularly on the west coast. This is important in order to make harvest more economically efficient in terms of manpower and capital and to conserve the resources.

Since 1981 Malaysia has adopted a Fisheries Licensing Policy addressed to (1) the elimination of the competition and the ensuing conflict between the traditional fishermen and minitrawler fishermen in inshore waters; (2) the prevention of overexploitation of the fishery resources in the inshore waters; and (3) the restructuring of the ownership pattern of fishing units in accord with the New Economic Policy.

One of the main strategies employed is allocation of fishing grounds through zones, so that areas close to shore are reserved for the smaller vessels. Another main strategy is the regulation of fishing effort through a license limitation to control excess capacity taking into account of the socio-economic and political aspects.

In following these strategies, several major issues and problems have arisen. The success of fishery management measures depends to a large extent upon the acceptance of the need and value of the measures by those who will be affected and by politicians. Since allocation decisions are political, fishery administrators must have full support at the political level.

This means that there must be full comprehension of the unique common property characteristics and the necessity for government intervention. It is also necessary that the management measures be backed by sound scientific facts and socio-economic informations in order to ensure credibility.

An additional requirement is the need for coordination of all relevant government agencies in order to ensure that policies and actions are not counter-productive. This includes, for instance, involving those agencies that can help in re-allocating excess fishermen by creating alternative employment opportunities, providing training for new skills, and initiating special land schemes for fishermen.

There is an urgent to look into compensation for the fishermen to be reallocated or excluded from the fishery sectors. This requires surveys of the economic profiles of the fishermen.

Finally, there is an urgent need to develop the capability of the management and research personnels.

ACKNOWLEDGEMENT.

I am indebted to Professor Dennis Nixon, the advisor; the faculty members of the Department of Geography and Marine Affairs, University of Rhode Island; Department of Fisheries, Ministry of Agriculture, Kuala Lumpur, Malaysia; and finally the Government of Malaysia for the financial support.

CONTENTS

PAGE

C H A P T E R I

I N T R O D U C T I O N

CHAPTER I

I. INTRODUCTION.

Fish is a common user resource where access is usually open to everybody but the responsibility of conservation and management is not taken up by the individual exploiting it. For an individual fisherman, any fish that he does not catch will eventually be caught by his colleagues. In an open access system, the cumulative effort of all fishermen to maximize their catches will inevitably result in overexploitation which in turn will adversely affect the resource and the livelihood of the fishermen. Since no individual fishermen will take upon himself to conserve and manage the resource, the responsibility of fisheries management and conservation normally will have to be borne by the Government of a nation.

Fisheries management may be broadly defined[1] as continuing dynamic processes concerned with the protection, enhancement, and allocation of living aquatic resources in a manner that provides the greatest benefits to society. It involves judicious application of results derived from research in biological, economic, legal, institutional, and social science discipline. The evolution of fisheries management has followed many long and torturous trails, some of which have had a dead-end.

Rational management of the marine fisheries resources is therefore a very complex subject involving various disciplines, such as fish biology, statistics, economics, sociology and politics. The adverse effects of unmanaged or poorly managed fisheries has been too well documented. As a result, the Malaysian Government is very much aware of the need to utilize the marine fishery resources in the most rational and prudent manner.

The length of Coastline of Malaysia[2] is about I,200 miles long.[3] It supports a relatively small but significant fisheries. Malaysian marine fisheries are essentially small scale in shallow waters (less than 50 meters deep), predominantly within the territorial waters of I2 miles from the shore. Very few of them are found beyond this area.[4]

Prior to I963, the Malaysian marine fish catch was taken by traditional gears such as the bag nets, bottom gill nets and traps operating in inshore waters. At that time the greater part of the licensed fishing fleet operating in waters off Peninsular Malaysia was not motorized. In I96I, less than a quarter of the total licensed fleet of 22,959 was inboard power.[5] The fisheries had undergone a major growth in the late I960's and early I970's, with total landings increasing from 300,000 tonnes in I967 to 650,000 tonnes in I98I.[6] This spectacular growth resulted mainly from the introduction of trawling for prawns in the west coast

of Peninsular Malaysia. The licensed trawler fleet grew from a few vessels in the early sixties to 4,326 vessels in I982.[7] To date, this gear contributes close to 40% of the total marine fish landings in the country.[8]

There were 27,74I licensed fishing boats in Malaysia in I982.[9] Of these, 65% were inboard powered boats, 25% were outboard, and I0% were non-powered. Most of the inboard powered boats were less than I5 gross tonnage (GRT) and powered by the engines of less than 40 horsepower (HP).

The bulk of these fishing boats (i.e. I9,62I units) were concentrated on the west coast of the Peninsular. The majority of them were inboard powered. There were 8,I20 fishing boats licensed on the east coast the majority of which were also inboard powered of less than I5 GRT.[I0]

C H A P T E R II

T Y P E S O F F I S H I N G G E A R S O P E R A T E D

I N M A L A Y S I A.

CHAPTER II

2. TYPES OF FISHING GEARS OPERATED IN MALAYSIA.

The fishing gears operated in Malaysia can be classified generally into two types i.e. the commercial and the traditional gears. Appendix I [II] listed the various types of fishing gears being operated in the country.

However, about 80% of the operated gears are of traditional type.[I2] Appendixes 2 (a) to 2 (f) illustrate some of these fishing gears.[I3] They would include gill or drift nets, lift nets, hook and lines, traps, bag nets, and barrier nets.

The total number of fishermen present in the whole of peninsular was 80,000 people (based on I982 statistics) of which 67% were traditional fishermen. It is important to note that the traditional fishery in Malaysia plays an important role in the national economy and is the mainstay of the fishing industry in Malaysia. It contributed some 2I0,700 tonnes of fish annually or 40% of the total marine fish landing in Malaysia.[I5]

There are two major types of fish being harvested in Malaysia.[I6] They are the pelagic fish (free swimming) and demersal fish (fish that are associated with the bottom of the sea). Appendix 3 illustrates the various types of pelagic and demersal fish that are commonly found

in the country. Among the common groups of pelagic fish found would include mackerel, sardines, anchovies, and pomfret. The common demersal fish, on the other hand, are the shads, flounders, halibuts, redfishes, basses, jacks, and rays. Crustacean such as crabs, lobsters, and shrimps are also found. Oysters, mussels, cockles, clams, and squids are among the groups of molluscs which are frequently caught in Malaysia.

C H A P T E R III

F I S H E R I E S R E S O U R C E S I N M A L A Y S I A.

CHAPTER III

3. FISHERIES RESOURCES IN MALAYSIA.

Models Used For Assessment.

In Malaysia, the population dynamics model that is widely used in the assessment of fish stocks (multispecies fishery) is the Schaefer's or Gulland-Fox logistic model.[18]

The use of this model seems necessary since very little biological data are available. The model combines the effects of recruitment, growth, and mortality as a common function of the mean population growth, and requires only catch and effort data.[19]

Furthermore, it was proposed[20] that the stock production model of the Schaefer's type could be applied especially to trawl fisheries in Malaysia because: (I) the trawling, for example in the east coast of Malaysia, is not aimed at any particular group of fish; and (2) the Malaysian consumers' preference for fish is quite flexible. For example, an average Malaysian will prefer promprets (Pampus sp.) to breams (Nemipterus sp.), but when the price of breams is very much lower, they willingly switch to buying breams.

However, the limitation of the use of this model is the lack of reliability of the catch statistics.[21] It is believed that some of the catch are not reported by the fishermen. The catch sometimes are landed on the beach or taken for "home consumption". However, such cases of

non-reporting occur in cases of small unregistered boats and would not affect the stock assessment significantly.

According to the stock production model (Appendix 4), under the long term equilibrium the rate of increase of total catch decreases with increasing effort until a level of the maximum sustainable yield (MSY) is reached. Here, no further increase in total yield is possible. Further increase in effort will result a decrease in the total catch. The decreasing portion of the yield curve is symmetrical to the increasing portion.[22]

The model as shown in the appendix 4 also shows that at any single level of total catch, the yield at C_I, can be exploited at two levels of fishing effort F_I and F_2. At effort F_I, which is before the MSY, much less capital input is required to catch the same amount of fish as at the effort level F_2. The difference between F_2 and F_I is a redundant effort involving a waste of capital, operational costs and manpower.

From the same appendix, it is obvious that increasing the effort will increase the total catch but the catch per unit effort (CPUE) will inevitably fall due to competition. The most profitable ventures in fisheries will be the earlier stages. However, due to the lucrativeness of the fishing ventures in the early stages, a scramble to join

the fisheries will ensue. The phenomena of uncontrolled and accelerated capitalization during the early stages of fisheries development as documented in many countries showed disastrous effects.

Status Of Fisnery Resources In Malaysia.

Analysis of catch and efforts statistics and of the result of research surveys have led to the conclusion by the Malaysian Government that despite the continuously rising catch trend (Appendix 5)[23] the stock of both demersal and pelagic fish in the inshore fishing area are either intensively exploited as in the east coast or overexploited as in the west coast of the peninsular.[24]

With the rapid expansion of the trawl vessels in the west coast, the annual landing of the demersal fish increased to nearly I00,000 tonnes in I968, approximately five years after trawling was introduced.[25] By I978, annual landings of demersal fish increased to 256,000 tonnes of which about 92% were landed by the trawl vessels (Appendix 6)[26]. But, the report of the workshop on the fishery resources on the South China Sea Fisheries Programs[27] estimated that the potential yield of demersal fish stock off the Malacca Straits on the west coast was only 2I3,000 tonnes. Therefore, it appears that the present level of exploitation of the demersal

stock on the west coast has surpassed its maximum sustainable yield. In short, the demersal fish stock off the Malacca Straits on the west coast has been overfished.

Furthermore, the decline in the demersal resources in the inshore areas of the west coast of the Peninsular Malaysia can be seen from the study of Penang trawl fishery.[28] In 1966, the catch per boat was 16.16 tonnes. This dropped to 3.86 tonnes in 1974. Mohd. Shaari[29] also reported a drop from 0.88 tonnes per trawler per day in 1966 to 0.30 tonnes per day in 1972.

Fisheries Research Institute (FRI), Penang, Malaysia carried out a series of demersal fish surveys. In these surveys, a drop of catch rate for the west of the peninsular was also recorded (Appendix 7)[30].

Another gross indication of overfishing in the west coast is in terms of declining catch per unit effort (CPUE) as fishing effort increases. As shown in the Appendix 8,[31] there was a steady decrease in the CPUE of trawl vessels from 1967 to 1972. Evidence of rapidly declining CPUE was most noticeable off the North-west States of Kedah, Penang, and Perak.[32]

There are indications to suggest that overfishing has resulted in decreasing the proportion of commercial valued species and increasing the quantity of trash fish. It was estimated that the proportion of trash fish of total landing

increased from I6% before I966 to about 33% in recent years.[33] The substantial increase in the proportion of trash fish landings was mainly attributed to trawl vessels whose average catch consisted of up to about 54% trash fish (Appendix 9).[34] Studies have shown that while a portion of the trash fish caught by trawl vessels consisted of uneconomic species, sometimes some 27% of the trash fish was made up of juveniles of commercially important species.[35]

Such overexploitation of the fisheries can be further illustrated in one of the states in the west coast of the Peninsular Malaysia i.e. Selangor (Appendix I0).[36] The figure shows the total catch and the number of operational trawlers in that particular state. There had been an increase in the number of trawlers from 688 boats in I973 to a maximum of I,587 boats in I979 with a slight reduction to I366 units in I982. The increase in boats resulted in a steep increase in the total landings from 35,000 tonnes in I973 and peaked at 82,500 tonnes in I977. Subsequently, the total catch fell sharply down to 25,000 tonnes in I98I and rose slightly to 27,500 in I982.

It is obvious from the table in the Appendix I0 that the number of fishing effort in I982 was about twice as much as that in I973. However, the total catch decreased significantly from 35,000 tonnes in I973 to 27,500 tonnes in I982. This implies that resource was overexploited and the number of

redundant boats in the industry was estimated to be 678 boats.

Data from the Taiwanese pair trawlers fishing in Malaysian inshore waters in the east coast have indicated a general decline of the inshore demersal resources in that region.[37] For 1970, the CPUE was 481.1 kg. per hour-tow. By 1978 this dropped to 261.9 kg. per hour-tow, but rose to 365.9 kg. per hour-tow in 1979. Subsequently in 1980, the CPUE dropped to as low as 234.9 kg. per hour-tow.

A series trawl surveys conducted by the FRI also indicated a declining trend in CPUE in the east coast of the peninsular (Appendix 7)[38].

In 1982, Mohd. Azmi Ambak, et al. assessed the trawlable demersal stock off the east coast of the Peninsular Malaysia.[39] The results indicated that the demersal fisheries (especially trawl fisheries) were already operating at the MSY level. The MSY estimated were 38,500 to 42,000 tonnes, while the trawl landings were 47,439 tonnes and 33,306 tonnes in 1979 and 1980 respectively.[38 (a)] Therefore, the prospects for further expansion is rather bleak. It was suggested that any expansion should be directed further offshore.

However, the actual status of the pelagic resource both in the west and the east of Peninsular Malaysia is not very clear. To date, only fragmentary research data on the pelagic resource are available. Nevertheless, it must not

be ignored that the pelagic fish resources, being migratory in nature, may exhibit fluctuation in abundance. Therefore, pelagic fish landings may be very nigh in certain years and low in other years. On comparison with the estimated potentials determined mainly through commercial data (as shown in Appendix II),[40, 4I, 42.] the inshore pelagic resources off the east coast of Peninsular Malaysia appear to be maximally exploited.

The availability, nature, distribution and abundance of the resources in the offshore area deeper than 50 meters (predominantly beyond the territorial sea) have yet to be fully determined, although some preliminary informations based on the catch of Taiwanese pair trawlers are available. Yeh,[43] in I98I, estimated a density of 4.I0 tonnes per square km. in the offshore region of the east coast of Peninsular Malaysia in I970-I97I. Using this density and assumming that the fish stocks were still unexploited at that time, a total biomass of 366,I0I tonnes was obtained. This yields a potential of I76,46I tonnes of fish in the offshore area if the MSY is 0.482 of the total biomass.[44]

CHAPTER IV

THE FISHERIES ACT AND REGULATIONS.

CHAPTER IV.

4. THE FISHERIES ACT AND REGULATION.

In Malaysia, the main legislation which is directly concerned with the purpose of conserving and managing the fish stock is the Fisheries Act I963 and the various subsidiary legislations made under the Act.

The Fisheries Act provides powers to the Federal Minister to make regulations for the control and protection of maritime and estuarine fisheries within the territorial sea. The Act also provides the State Authorities to make rules for riverine fisheries. Among the many regulations that the Minister can authorize under the Act would include: (I) issuance of licenses; (2) prohibiting the killing or capture of fish of any particular species or size of fish in any specified areas; (3) determination of minimum mesh size of the cod end of a fishing net; (4) stipulation of areas and the periods of time in the year within which any particular method of fishing is prohibited or restricted.

While the general provisions are made in the Fisheries Act for the protection of fisheries, the detailed provisions and specifications of the conservation and management measures are spelled out in the subsequent Fisheries Regulations. For example, the detailed provisions and specifications for licensing activities are provided for in the Fisheries

(Maritime) Regulations, I967. These regulations specify that a person must possess a fishing license before operating any fishing appliances. They also specify the terms and conditions to be attached to the licenses. The amount of license fees and deposits for fishing appliances are clearly specified in the regulations. Under the Fisheries (Maritime) Regulations I980, substantial amendments were made to the terms and conditions of licenses for trawl fishing, especially with regard to trawling zones and mesh size.[45]

Another example of the regulations is the Fisheries (Cockles Conservation And Culture) Regulation, I964. The regulation requires license for the collection of cockles. It also regulates the minimum size of the cockles to be harvested or to be transplanted. The size should be at least 3I.8 mm (I.25 inches) and 6.4 mm (0.25 inch) respectively, measured in a straight line across the widest part of the shell (Appendix I2).

The Fisheries (Prohibition of Method of Fishing) Regulations I97I, specifies the types of fishing gears prohibited.

The Fisheries Act of I963 and the various subsidiary regulations made under the Act represent attempts by the Malaysian Government to conserve and manage the fish stock. Unfortunately, there are still several deficiencies and weakness in the Act in providing a strong basis for sound

decision making. The most serious deficiency of the Act and its regulations is the lack of well-defined management objectives which can easily be understood by everyone involved in the fishing industry.[46] Failure to provide clear objectives for fishery management will only lead to confusion as to the kind of techniques needed for effective management. Under such circumstances, decision makings tend to be and hoc and haphazard.

Given the ambiquous nature of the general provisions of the Act, it is not surprising that the basis of the subsequent regulations is weak and haphazard. Generally, its basis was not in a long term management objective, but rather in providing temporary solutions to some current problems. As a result, six Fisheries Regulations have been enacted over a relatively short period of time. For example, (I) the Fisheries (Cockles Conservation and Culture) Regulations, in I964; (2) the Fisheries (Prohibition of Import of "Piranhas") Regulations, in I966; (3) the Fisheries (Maritime) Regulations, in I967; (4) the Fisheries (Prohibition of Method of Fishing) Regulation, in I97I; (5) the Fisheries (Maritime) (Amendment) Regulations, in I980; and (6) the Fisheries (Maritime) (Amendment) Regulations, in I982.

What is particularly frustrating is the fact that despite the evidence of serious overfishing, (especially on the west

coast) in the early I970's, there were no adequate and appropriate rules or regulations instituted to solve the problems then.[47] It was generally felt that the solution to such problem should have done at an early stage, not when the problem had already become deep-rooted. Failure to adopt such remedial measures at the very beginning of a problem would affect the effectiveness of the subsequent management and conservation programs.

In short, the Malaysian approach to fishery management and regulation in the past has been haphazard and ad hoc. The Fisheries Act, I963 and the various Fisheries Regulations at best could be described as a patchwork of some disjointed series of decisions, instead of being formulated within the framework of an overall comprehensive management plan.

The Fisheries Act, I963 had been enforced for the past twenty-two years. However, in I985 the Government of Malaysia decided to amend the Act to include the current issues such as the Exclusive Economic Zone (EEZ) of Malaysia, marine park or marine reserve, culture system, inland fisheries, international fishing agreement, foreign fishing, and the Fisheries Management Plan[48] (prepared by the Director General of Fisheries).

As a result of this, the Fisheries Act I963 was repealed.[49] However, the regulations under this Act are still being implimented until the new regulations under Fisheries Act I985 are made.

The objective of amending the Fisheries Act I963 is to establish a more comprehensive and up-to-date Fisheries Act. Hence, it would enable the Government of Malaysia to administer and manage the fisheries resources more effectively both in the Malaysian fisheries waters (i.e. the internal waters and territorial waters) and the EEZ of Malaysia. The Fisheries Act I963 was found to be inappropriate since it did not include many new issues such EEZ, foreign fishing, aquaculture, inland fisheries, Marine park, Fisheries Management Plans (FMP), etc.

In short, the significant differences between the new and the former Fisheries Acts can be summarized as follows. Part III of the new Act requires the Director General (DG) of Fisheries to prepare and keep under continual review the FMP. The plans should be based on the best scientific informations available and are designed to ensure the optimum utilization of fisheries. Overall national policies, development plans, and programs have to be taken into account in the fisheries plans. However, in the past the Malaysian approach to fishery management and regulations was haphazard and ad hoc since there was no FMP specified in the old Act.

In the new Act (Part IV), the DG of Fisheries is provided with an authority to license both the fishing boats and the fishing gears. In the past fishing gears were

licensed under the Fisheries Act I963, whereas the fishing boats under the Merchant Shipping Ordinance, I952. As such, a fisherman was required to carry two different (separate) licenses before they could go for fishing. However, under the present system the fishermen will only be carrying one license with them, since both the boat and gear licenses have been condensed into one.

Another difference worth considering is that in the later Act, one has to obtain a permission from the DG of Fisheries before they can build up a boat for fishing purposes. The idea is to control on the fishing effort and fishing efficiency (in terms of the size of the boat and the horsepower of the engine used). However, such control was not provided in the former law.

Part V of the new Act is concerned with the control upon the foreign boats fishing in Malaysian waters and EEZ. On the other hand, there was no such provision in the Fisheries Act I963.

Furthermore, in the recent Act, the maximum fines to be incurred on both the foreign and local fishing vessels have been increased drastically. Under the old Act the maximum fines for all types of boats were merely M$I,000.00 (US$400.00). However, in the new Act the owners of foreign vessels and local vessels can be fined not exceeding

M$ I million(US$400,000.00) and M$50,000.00 (US$22,000.00), respectively. The rational of increasing the fines is to enable the Government of Malaysia to conserve the fisheries resources more effectively, since the higher fines would act as a deterrent to the law violators.

Another difference between the two Fisheries Acts is that the recent Act contains the provision (in Part VI) pertaining to the development and control on the activities of inland fisheries. The objective is to promote the development and rational management of inland fisheries through various means such as coordination of research between the Federal and the State Governments; provision of technical assistance and advice to the appropriate state authority; provision of advice on measures for the prevention of fish diseases; etc.

Part VIII of the new Act specifically mandates the DG of Fisheries to plan the development and control on aquaculture. However, the former Fisheries Act did not contain such mandate. Similarly, the provisions for the establishment of marine park and marine reserve are found only in the new Act, not in the old one.

C H A P T E R V

T H E N A T U R E O F T H E P R O B L E M F A C E D

B Y T H E F I S H I N G I N D U S T R Y.

CHAPTER V

5. THE NATURE OF THE PROBLEM FACED BY THE FISHING INDUSTRY.

For the inshore areas of Peninsular Malaysia particularly the west coast, fishing effort and investment need to be reduced to make harvest more economically efficient in terms of manpower and capital and to conserve the various fish resources.

Besides the problem of resource factor, the rapid development of the Malaysian fisheries in the early sixties and seventies had brought problems rather than benefits to the small scale fisheries operating traditional gears. This might be attributed to the deficiencies of fisheries plans to provide for effective management and to regulate the expansion of the trawl fisheries, in particular the mini trawl fisheries into the most productive fishing grounds where the small scale traditional fishermen operated. The traditional fishermen were already in difficult socio-economic straits, with an average income among the lowest in the nation.[50] Further deterioration of their position took place due to disruption or displacement by the event of trawling.

Prior to 1980, there were no clear cut strategies for the proper management of the fisheries resources. The management had been merely on a problem-oriented basis,

that is, reacting to the problems as they appeared. Using the same approach after the introduction of trawling resulted in a series of problems which led to intensive fishing and overexploitation of the resources. Another factor which led to and exacerbated this problem of lack of clear cut strategies for the management of the resources was the absence of sufficient good data base for the planning of management strategies.

The problems therefore that prevail in the Malaysian inshore fisheries are an excess of fishing units. Consequently, too many fishermen, intense fishing and hence the competition for limited resources lead to the declining catch rates and reducing income in especially the traditional fisheries sector of which the majority of fishermen belongs.

C H A P T E R VI

M A N A G E M E N T M E A S U R E S.

CHAPTER VI

6. MANAGEMENT MEASURES.

The lack of sound management strategies in the context of intense exploitation and over capitalization led to the formulation of a management policy which was adopted in I98I.

The Fisneries Licensing Policy was initially formulated to solve the problems arising from tne conflict between the traditional fishermen and the mini-trawler fishermen in the inshore waters. The objectives of the policy are (a) to eliminate the competition and the ensuing conflict between the traditional fishermen and the mini-trawler fishermen in the inshore waters; (b) to prevent overexploitation of the fishery resources in the inshore waters; (c) to have a more equitable distribution of fishing throughout the waters under the jurisdiction of Malaysia; (d) to restructure the ownership pattern of fishing units in accord with the New Economic Policy;[5I] and (e) to promote the development of offshore industrial fisheries.

Zoning.

The main strategy employed is the allocation of fishing ground through zoning.[52] Four zones are established under the policy. The first zone, from the shore to 5 nautical miles from tne shore, is reserved for owner-operated

traditional fishing gears; the second zone, between 5 miles and I2 miles from the shore, is reserved for owner-operated trawlers and purse seiners less than 40 gross tonnes (GRT), the third zone, between I2 miles from the shore and 30 miles from the baseline of the territorial waters, is reserved for trawlers and purse-seiners greater than 40 GRT, and other fishing gears, wholly owned and operated by Malaysian; and foreign fishing including joint-venture, lease-purchase, or charter is restricted to the fourth zone which is between 30 miles from the baseline of the territorial waters and the outer limit of the Exclusive Economic Zone (EEZ).

The zoning system can be summarized as follows:

Zones	Areas	Boats
A	Within the 5 miles from the shore.	For artisanal fishing boats; owner-operator.
B	Beyond 5 miles from the shore.	Trawlers and purse-seiners with boats below 40 GRT; owner-operator.
C	Beyond I2 miles from the shore.	Trawlers and purse-seiners with boats 40 GRT and above.
D	Beyond 30 miles from the baseline.	Foreign-owned boats, 70 GRT and above.

The map in the Appendix I3 illustrates those zones. It is important to note that the fishing boats licensed in zone A can fish in all the zones (B, C, and D). However, the boats in the zone B are allowed to fish in other zones except zone A. Similarly, the boats in zone C can fish in zone D, but not in A and B. The boats in zone D can only fish in zone D.

Fishing boats from different states in Peninsular Malaysia have different colors of painting on their wheelhouse. This is essential for identification and enforcement purposes because generally the boats that fish in the zones A and B in one state are not allowed to fish in the same zones of other states. However, those boats which are licensed to fish in zones C and D are permitted to fish freely in the zones (C and D) irrespective of the states. Nevertheless, the fishing boats licensed in the west coast of Peninsular Malaysia are generally not allowed to fish in the east coast and vice-versa.

Each trawler is required to have a 'white stripe' drawn diagonally from the top right hand corner to the bottom left hand corner of the wheelhouse. This would facilitate the enforcement against their encroachment activities. In addition to this, every fishing boat must have a code zone (A, B, C or D) clearly painted on the wheelhouse to denote the area it is allowed to fish. These are part of the conditions of the fishing license and they have to be checked every year

before the licenses are renewed.

Under the Fisheries Act, if the fishing boats are caught infringing in other zones or states, they could be compounded not less than M $500.00 (US $217.00) for the first and second offenses.[53] However, they would be prosecuted to the court for the third offense. If the boats are proven guilty, the owner could be fined not exceeding M $50,000.00 (US $22,000.00) or a term of imprisonment not exceeding two years, or both,[53(a)] and the boats may be forfeited.[53(b)]

The zones are established according to the types of fishing gears, the size of the boats, and the ownership of the fishing units to ensure a more equitable distribution of fishing, fishing effort, ownership and the benefits obtained from fishing. Fishing effort in each zone is regulated through limited entry system to prevent overexploitation on the resources.

Therefore, with the existing system of zoning, zone A which is the main breeding area for fish and shrimps, allows only the full time traditional fishermen who operate on their own boats (owner-operator) to fish. The commercial boats such as the trawlers and purse-seiners are prohibited to fish in this area. As a result, the zone A will not only be conserved from being completely overexploited and destroyed by the trawlers (destructive gears)[54], but at

the same time it eliminates competition in exploiting the resources and the conflicts between the commercial and artisanal fishermen in inshore waters. Therefore, the artisanal fishermen could exploit maximally the rich fishing ground and eventually improve their catch per unit effort (CPUE) and hence their income.

Zone B, on the other hand, completely eliminates competition between the mini-trawlers which are normally comprised of boats below IO GRT owned by the genuine fishermen and the large trawlers (40 GRT and above) owned by big entrepreneurs since the latter have to operate in zone C and beyond.

Restructuring Ownership Pattern.

With the existing fisheries policy, the fishing units in the zones A and B which are not operated by the owners themselves (owner-non-operators) were phased out. The five-year phasing out programs of owner-non-operator boats started in I98I and ended up in December I985. Therefore, by January I, I986 all the boats in those zones have to be operated by the owners (owner-operators). The owner-non-operators have to sell their boats to genuine fishermen (who have no boats at all) and either go for the deep sea fishing or leave the fishing industry completely.

The objective of the policy is to ensure that the rich fishing ground is allocated only for the

genuine fishermen who operate on their own boats. Therefore, by doing so, the fishermen could improve their catch and hence their standard of living.

Limited Entry And Removal of Surplus Fishermen.

The main problem faced by the inshore fishing industry in Malaysia is the overexploitation of the resources especially on the west coast of the peninsular and the presence of excess fishermen in the industry. As a result, the fishing effort and investment need to be be reduced in this area so that the harvest will be more economically efficient in term of manpower and capital and to conserve the various fish resources.

Since I98I (the implimentation of Fishery Licensing Policy), no new fishing license in inshore areas has been issued. The number of licenses issued is to be based on the quota which is determined by the value of maximum sustainable yield of the resource in the inshore waters. In fact, the situation now is that the number of boats licensed far exceeds the amount that could be sustained by the resources. Therefore, in order to conserve the resource effectively, the excess efforts in the inshore have to be removed out of the fishing industry.

Under the New Agricultural Policy (I984) the Government of Malaysia has decided to remove a total of I6,05I units of boats in the inshore area out of the fishing industry.

The number of fishermen involved was estimated to be 30,000 people.[55] Perhaps, millions of dollars are required by the government to buy over the boats and pay to them as compensation. Furthermore, arrangement must be made to reallocate them into other economic sectors which are more productive. The assistance for the dislocated fishermen are essential because a management policy that does not provide any avenue for the surplus fishermen to get out of fishery except by way of going broke, with loss of boats, experience, and capital to the industry, is considered as no management at all.[56]

Examples of the economic sectors which are fisheries related would include deep fishing, aquaculture, fish cage culture (mariculture), fish processing, etc. Whereas, the non-fisheries related activities are farming, construction, business, services and various land schemes such as the Federal Land Development Authority (FELDA) and Federal Land Consolidation Rehabilitation Authority (FELCRA).

Aquaculture is still in its early stages of development in Malaysia. From the viewpoint of resources, the potentials for the development of aquaculture in Malaysia are tremendous. A rough estimate shows that the total potentials for aquaculture development is in the region of 350,000 hectares.[57] The vast aquaculture potential especially in the coastal areas holds considerable promise for the artisanal fishermen

because of its prospect for employment generation. This is particularly important because the development of aquaculture would provide as one of the outlets for siphoning off the surplus labor to more gainful activities. Therefore, top priority is accorded by the Government to accelerate the development of aquaculture in Malaysia.

So far a total of more than 800 fishermen families have already been resettled in the various land schemes.[58] The authorities concerned not only develop the land (rubber and oil palm) and hand it over to the settlers for maintainance but also handle the marketing and processing of their produce. Since the land schemes have met with a considerable success, the Government is developing a 20,000 acre oil palm plantation in Trengganu (one of the states in Malaysia) to cater specifically for the surplus fishermen.

However, before any action is taken to limit the fishing effort through buying-back the surplus fishing boats, limiting the licenses issued, and reallocating the surplus fishermen, the registration of fishermen is a basic sine quo non. Upon realizing the importance of this registration, the Government of Malaysia has decided to begin the registration exercise from July, 1985 to November, 1986.

The objective of the registration is of a dual purpose. Firstly to actually identify who the full time fishermen

are by the number, gear type, and location. Secondly, to closely monitor the resettlement programs when it is implimented to ensure that no new entrants enter the fishing industry to replace those who have been relocated.

Each fishermen who is registered is issued an indentification card (Fishermen Card). A register is kept of all the registered fishermen both at the national and state levels to keep track of such fishermen. A policy will be made that only fishing crew issued with a Fishermen Card can work on board fishing boats. This is to ensure that the purpose of registration is successful. If there is no such policy, new entrants will come into the industry and defeat the whole purpose of the fishermen resettlement programs.

The registration exercise will not only give the actual number of fishermen in the industry for the first time on a district by district basis, fishermen by type of gear, but also the register will be used as a basis for any future planning and monitoring for the inshore fisheries.

By imposing a limited entry system and reallocating the surplus fishermen, such actions will not only conserve the resources in the inshore areas from perpetually over-exploited, but they also allow those fishermen who remain the industry to enjoy (with less competition) the maximum benefit of exploiting the resources and eventually improving their catch rate and livelihood. No doubt that the elimination

of such fishing effort would drive down the total catch in the industry, but conservation of the fishery resource is more significant in this case. This is a long term planning.

By applying a limited entry system alone would not be fully effective in achieving the management objective. It needs to be coupled with other management measures such as the control on the mesh size of fishing gears, prohibition of certain gears, and many others.

Under the Fisheries Regulations (Amendment) 1980, the mesh size for the cod end of a trawl net has to be increased from 25mm (1 inch) to 38mm (1.5 inches) internal-extension measure. The objective of the policy is to allow the undersize fish to escape and eventually grow to the marketable size. Furthermore, the use of beam trawl, pair trawl, explosive, poison or electrical devices to catch fish are strictly prohibited.[59] The idea of such regulations is to conserve the fishery resources.

Development Programs.

Among the development programs specifically aimed at conserving of inshore resources are the construction of artificial reefs and marine park. Recently a total of 30 artificial reefs have been constructed by the Government and another 50 more are in a planning stage. Artificial reef would create a condusive environment for the fish to

take shelter and breed. Fishing are strictly prohibited in areas where artificial reefs have been built. Once the depleted resources in certain areas are replenished, the catch rate of the fishermen could be improved.

The maritime state such as Malaysia requires marine park in order to conserve and manage the resources especially in the coral areas. The coral areas contain flora and fauna communities and they appear to be the most productive natural community from the biological point of view. The water in the coral areas plays an important role as a natural breeding area for flaura and fauna, including the fish with the potential commercial value.

Presently, Malaysian Government plans to establish the marine park and marine reserve with the following objectives (I) to maintain the existing natural beauty of the environment and to conserve them from being adversely affected by the development surrounding it; (2) to replenish and maintain the habitat of a particular species which has been destroyed, (3) to establish a recreational area for the public without actually affecting the natural community surrounding it; (4) to conserve the areas especially for those which have been turned into breeding grounds for fish, plants, and many others, and (5) to improve and develop those areas which have been adversely affected or destroyed by other activities such as the development and industrial activities.

The plan to develop and manage the marine park and marine reserve in Malaysia would include not only the maritime areas, but also the islands or parts of the islands. All the industrial developments on the islands and the activities surrounding them would be controlled. The objective is to ensure that all the flora and the fauna communities around the areas would be conserved.

As an initial step, the Government has gazetted six islands including Pulau Paya, Pulau Babi, Pulau Tinggi, Pulau Kapas, Pulau Tioman and Pulau Redang (Appendix I4).[60] Based on the recent studies, a master plan pertaining to marine park was carried out. The plan includes establishing zones for various uses such as for scientific research, reserved area, and for recreational and tourist activities. The master plan would also determine the types of development activities allowed in such zones and complete guidelines would be established.

Deep Sea Fishing.

The resources in inshore areas are overexploited. Therefore, it is the policy of the Malaysian Government to encourage the deep sea fishing, especially in areas of beyond 30 miles from the shore which is still underexploited. In the area between I2 to 30 miles from the shore, the resources are intensively exploited.

Since fishing in offshore areas calls for a large capital, high technology, and moreover the potential fishery resources in the area are uncertain, the local entrepreneurs are unwilling to invest in such activities. They prefer to invest in some other economic activities which are less risky.

In order to remedy such problems and at the same time to develop the offshore fisheries, the Government of Malaysia is taking the following steps: (I) to encourage the local fisheries entrepreneurs to participate in offshore fisheries by providing them with financial assistance and incentives; (2) to encourage the joint-venture between the boat owners (commercial fishermen) in the west coast of Peninsular and the cooperative in the east coast. The boat owners on the west coast are more capable in terms of capital and offshore fishing technics. In contrast, the fishermen in the east coast lack for such requirements, but they have larger area of fishing (Exclusive Economic Zone - upto 200 miles from shore); (3) to encourage the joint-venture between the local fisheries entrepreneurs and the foreign fisheries entrepreneurs; and (4) to license the foreign boats directly (direct licensing) for them to fish in Malaysian Exclusive Economic Zone (EEZ).

The present fisheries management policy on offshore fisheries has adopted all the above alternatives, except

that of number (4). By adopting those steps, the deep sea fisheries are expected to develop as soon as possible.

Among the physical incentives provided by the Government to the local fishermen to build up the boats of size more than 70 GRT for them to fish in the deep sea are the exemption of import duty on the imported fishing facilities including the materials for the net construction, and providing the loan through the special credit scheme with low interest rate (soft loan).[61]

Although the Government encourages the Malaysian citizens to develop the offshore fisheries, the achievement in such development is unsatisfactory.[62] This is mainly due to the fact that the local fishermen lack for skills, technology know-how and management capabilities to develop the deep sea fisheries. Therefore, with the present situation, Malaysia is obliged to allow foreign fishermen to exploit the fisheries resources in its EEZ through joint-venture agreements. Such program is merely on a temporary (short term) basis until the local fishermen are able to carry out the activities by themselves, after which the role of foreign fishermen would be phased out.

The joint-venture agreements[63] between the local and foreign partners would include: (I) the purpose of joint-venture is to assist the domestic company to develop the

fishing industry by transfering from foreign to local partners the technology and the knowledge necessary to run the operation successfully; (2) the initial equity held by the local partner (Malaysian citizens) shall not be less than 51%; (3) Malaysia reserves the right to require that the number of local crew members on board the joint-venture vessels be (a) not less than 25% of the complement of the crew in the first year of operation, (b) not less than 50% of the complement of the crew in the second year of operation (c) not less than 75% at the end of third year of operation (d) 100% at the end of fourth year of operation.

The advantages[64] of joint-venture with the foreign nations are as follows: (1) In 1983, Malaysia imported 162,050 of fish, 75% of which came from Thailand. However, most of the catch of the Thailand fishing boats were actually obtained from the Malaysian waters. Therefore, through joint-venture with the Thailand particularly, it is generally felt that not only the fishing activity of the foreign boats could be controlled, but the benefits of such fishing business could be shared locally; (2) offshore fishing industry in Malaysia could be developed rapidly; (3) there will be a technology transfer from foreign to local partners. The crew members of Malaysia shall be given an instruction and on job training by the

crews of other states, both onshore and onboard; (4) the joint-venture company would build up in Malaysia the necessary facilities such as the ice factories, processing plants, etc. Such an investment would help to develop the fish processing industry in the country; (5) the job opportunities would be created for the local people. Therefore. some of the surplus fishermen in the insnore areas could be reallocated into this sector; (6) the success of such joint-venture would encourage the local fisnermen and boat owners in the inshore areas to participate in offshore fishing. Therefore, the excessive fisning effort in the inshore waters could be reduced; and (7) all the fish caught by the joint-venture boats have to be landed and marketed as specified in accordance with the local marketing regulations. The idea is to protect the price of the local fish. Otherwise, the income of the local fishermen would be adversely affected.

However. the development of offshore fisheries must be coupled with an effective management and regulatory measures. It requires comprehensive laws, regulations and effective enforcement measures to ensure that the resources are properly and rationally managed and exploited.

Eventhough the potential resources in the area beyond 30 miles from the shore are still unclear, the Government of Malaysia managed to work out certain number of quota (licenses to be issued) for a period of I985 to I990 based on the fish landing by the local commercial fishing boats (70-I00 GRT) which are fishing in that area.

EEZ of Malaysia (International Obligations of Malaysia).

In April I980, Malaysia, as one of the coastal states, declared its area of 200 nautical miles as an EEZ. Such declaration extends the national maritime jurisdiction from 47,692 square nautical miles to I40,000 square nautical miles. The EEZ Act that is to be enforced in the area was approved by the Malaysian Parliment at the end of I984.

Part V of the Third United Nation Law Of The Sea Conference (UNCLOS III)[65] deals with sovereign right and responsibilities of coastal states in EZZ. Articles 6I and 62 of the treaty deals specifically with the conservation, management and utilization of the living resources.

Article 6I (I) requires that the coastal state shall determine the total allowable catch (TAC) of the living resources in its EEZ. Article 62 deals with the utilization of the living resources. Malaysia is obliged to give access to foreign nations any surplus of the resources.

Therefore, as one of the coastal states, Malaysia has certain mandatory obligation and duties to perform. It has to estimate the total allowable catch of the resources in the EZZ. At the same time, it is responsible to ensure that the resources will not be adversely affected as a result of overexplcitation.

Presently, Malaysia is lack of data or informations on the resources in its EEZ. Informations relating to area of fishing, period of fishing, fish migration, and many others are still unclear. The informations available presently are not enough to determine the TAC and the surplus as required by the treaty.

In order to fulfill the international obligations, Malaysia would have to formulate and impliment the management and conservation programs on the resource. Maximum sustainable yield (MSY) of the resource must be determined. Other factors such as the socio-economic, politics and the environmental factors should be taken into account.

Malaysia would have to monitor and control all the fishing vessels in the EEZ, including licensed and unlicensed vessels for both local as well foreign. Regular air surveillance on a creeping basis search has to be established in order to identify all the vessels fishing in the areas. Programs of regular checking on the fishing vessels are

essential to ensure that they do not deviate from the prescribed standards, conditions of license, and laws.

To achieve the management objectives, Malaysia has formed a committee called "National Maritime Coordinating Committee" (NMCC) recently. The committee consists of all the enforcement agencies including the Navy, Marine Policy, Air Force, and Fisheries Department. The main task of such committee is to coordinate all the enforcement activities in the EEZ of Malaysia.

C H A P T E R VII

I S S U E S A N D P R O B L E M S.

CHAPTER VII

7. ISSUES AND PROBLEMS.

The management measures described above were based on the biological, economic, social and political aspects. The main criteria was to control the excess capacity, taking into account socio-economic and political considerations.

The adoption of the regulatory measures through zoning and limited entry is both timely and laudable. The strategy of direct control over fishing effort (i.e. by limiting the number of fishermen, vessels, tonnage of vessels, units of gears) appears to be the most appropriate management technique to grapple with the problems of exploiting the fishery resources under common property conditions. Yet, there are many critical issues and problems that have to be tackled (and some have been remedied) before those techniques could be successfully implimented. For convenience, the issues and problems can be discussed under the following subheadings:

Implimentation of The Fisheries Management Policies.

An important criterion for successful fishery management measures is its enforceability i.e. the ease with which it can be accepted by those affected and implimented. The decision to allocate the fishing ground through zoning involves some difficult compromise between the trawler and

traditional fishermen. Needless to say, the trawler fishermen feel that they have been discriminated against vis-a-vis the traditional fishermen. It has also been asserted that particularly by the prawn trawler (mini-trawler) fishermen the decision to completely prohibit trawling within the 5 miles limit threatened their source of livelihood. They maintained that the prawn resources could not be found in waters beyond the 5 miles limit. Furthermore, majority of the affected trawlers are below 10 GRT and could not trawl effectively in deeper waters. There are 23% of the total trawlers under this category of tonnage.[66]

This leaves the fishermen with three option of either: (1) converting to bigger vessels to fish effectively in zone B and beyond, (2) abandon trawling completely and switch to traditional gears, or (3) maintaining the same fishing vessels and resort to illegal trawling in zone A.

It is highly pessimistic that the fishermen will adopt either of the first two options due to financial constraints. No compensation is included in this displacement program.[67] Therefore, the fishery administrators find it difficult to enforce this regulation. It is not unreasonable to expect that majority of the trawler fishermen resort to illegal trawling within the inshore waters.

Even those fishermen who can afford to build up new larger fishing units to effectively fish in the new zone are reluctant to destroy their old vessels. Section 9(4) under the Fisheries Act, 1985, specifically states that the Director General of Fisheries shall not issue a license or permit in respect of the new fishing vessel until the existing fishing vessel is disposed of in accordance with his directions.[68] This section is specifically meant for those who wish to build up a new boat to replace the old one. The later has to be destroyed once the new boat is ready to be licensed. If the destruction of these old boats are not enforced, the old boats would inevitably end up trawling illegally.

Another related problem is concerned with the minimum mesh size for trawl net which has been increased from I inch to I.5 inches cod-end. It was rationalized that the larger mesh size would reduce the rate of capture of juviniles of commercially valuable species by trawlers. However, the new mesh size regulation was severely opposed by the trawler fishermen who alleged that they had not been able to catch prawns using the I.5 inches mesh size cod-end. What was most disturbing was that the allegation and opposition by the trawler fishermen were strongly supported by certain powerful groups within the fishing community, including the local politicians. It will be very difficult for fisheries

administrators to impliment a management scheme that is violently opposed by many.

In short, unless the new management measures win the acceptance of the fishermen, and unless there is a strong political will to ensure the success of these measures, the tasks ahead for fisheries administraters seem formidable and insuperable.

Data Constraint.

The difficulty of implimenting the management policy is aggravated by the lack of accurate scientific facts and statistical information that could act as basis for sound policy formulation.

Malaysia presently suffers from a paucity of both biological, socio-economic and technical informations and their analysis in the fishery sectors. Adequate informations on resources under intensive exploitation and on unexploited resources in areas and subareas are unavailable. Collection of statistics in the country is by sampling at landing points. There is no routine programs to obtain accurate statistics of the fleets' catch and effort through requirement of fishing vessel operators to provide records of their operations. No applied research has been carried out on the various types of gears which are being operated and on the effects of the modification and innovation of these gears in the industry. The biology, locality, and occurrence of various species of

fish, prawns, and molluscs that commonly occur in Malaysia are unknown.[69]

In the course of implimentation of the fisheries licensing policy in 1981 and in 1982, the fishery administrators faced with the problems of not being able to estimate with confidence the number of licenses to be issued for each fishery in each state and subareas within the states. For example, when the trawler boats applied for additional seasonal licenses to operate purse seine nets, the administrators were unable to make a decision. This was due to the lack of informations on the seasonality of the fish to be caught, the locality of the stocks, and whether the present number of licenses for purse seines could be increased. However, the fishery administrators were merely advised to issue a certain fixed number of additional licenses. Obviously this sort of information is inadequate. To whom can the fishery administrators issue the licenses? To which states or subareas the licenses can be issued? What are the sizes of the boats and engines required? For how long (or number of months) the licenses can be issued? How was that fixed figure derived at? These were unanswered questions.[70]

The fishery administrators could not as well make a decision on the limitation of engine power, size and GRT of fishing boats to be levied on the various fisheries, or on the replacement of old boats. Again, the relevant

adequate informations were not available.

In the case of the trawl fisheries, it was evident that undesirable results had occurred in exploiting the inshore resources under common property condition, or at least substantial proportions of the resources were overexploited. However, the existing biological and effort statistics were not sufficient for fishery scientists to confidently conclude that overfishing has occurred and that the present level of exploitation has exceeded the MSY. Furthermore, even the estimate of MSY raised certain doubts and uncertainties as to its accuracy.[7I]

However, lack of informations could not simply delay the action to limit over-capacity. In such situation, the fishery administrators could either choose to postpone the decisions or make the decisions merely based on the rough estimates of the situation. For instance, a consistent downward trend of CPUE over a series of years indicates that there is a considerable pressure on the fishery industry. Therefore, the fishing effort must be controlled. However, in such atmosphere it is not surprising that the fishery administrators are unable to retain their credibility with the politician, the fishermen and their colleagues.

It is therefore necessary for Malaysia to be able to define the stocks available for exploitation by species and subareas. Composition of the stocks and of the catches with

respect to the abundance, age, size and sexual maturity should be determined. Informations of the effects of fishing on the stocks must be available. Such informations are necessary to measure the potential productivity of the stocks relative to their harvest capacity. It is also necessary for applied research on gear and boat operation and development to be initiated. Informations on the socio-economics of the fisheries are also required.

Equity Considerations.

The management measures of allocating the fishing grounds between the traditional and trawler fishermen and the resulting exclusion of the later in inshore waters (zone A) are indirectly aimed at the displacement and elimination of excess fishing units and fishermen.

However, the problems lie in "who should leave?" and "how is this to be accomplished with reasonable equity?" Perhaps, the group most likely to be displaced are those smaller trawlers. But, owing to insufficient funds, they are unable to switch to larger vessels to fish beyond the 5 mile limit. Therefore, it is important that any displacement scheme of this nature should provide some form of compensatory payments to those displaced. Without such incentives and facilities, the enforcement of any displacement scheme of this nature will only create political and social unrest.

Another measure of the management policy that involves equity is the license limitation scheme. The basic idea of this scheme is to restrict the number of entry into fishing and to remove excess fishing units and fishermen. The ultimate objective is to improve the economic returns of the remaining fishermen while at the same time to prevent overexploitation of the resources.

However, several issues are important to be considered here. Firstly, what are the criteria to be used in order to decide who should be licensed and who should not be licensed? Secondly, what is the optimal amount of licenses to be issued and the rate at which it should be approached? Thirdly, how are the licenses issued to be distributed for each state and for subareas within the states?

Once these questions are answered and the criteria determined, it is necessary to decide whether there will be an immediate reduction in the fishing units, or will there be a time span over which the number of units to be reduced. However, political reality will favor the second course of action as it is not too drastic.

Pertaining to the problem of who should be licensed is the difficulty of identifying exactly who has been in the fishery. This problems stems from the prevalence of illegal fishing vessels (trawlers). Owing to the weak and inadequate

enforcement, these vessels which are substantial in number have been operating illegally over the last 5 to 10 years undisturbed by the laws. After sometime, the authorities are left with no choice but to recognize the status quo of these fishing vessels. Furthermore, there has already been a strong political pressure to license these illegal fishing boats on humanitarian grounds, based on the fact that they have already been existing for the last several years. Therefore, to remove them under the license limitation would be enormously difficult.

Biological Effectiveness.

In limited entry system, it will only restrict entry into the fishery, but it will not prevent those who are already in from intensifying their fishing effort and increasing their productivity in order to increase the catch level. Therefore, although the number of vessels and fishermen are limited there may be no desire to reduce catch due to the fact that fish is a common resource and there is no real private ownership of the fish stocks. Furthermore, as the CPUE increases due to increased productivity, fishermen will be encouraged to increase the amount of effort as much as they can produce.[72] Hence, this will reduce the biological effectiveness of the control scheme. It is therefore necessary to supplement the limited entry system with catch quota, minimum size limit of the catch,

or other restrictions on fishing effort.

For instance, in Australian rock lobster fisheries, although licenses for such fisheries were frozen since 1963 at 630 units, the rate of exploitation on the resource still increased significantly.[73] The increase was due to the absence of control on the replacement of any fishing vessels. This in turn, increased the total fishing power.

In order to avoid such problem in Malaysia, it is specified clearly under the Malaysia's Fisheries Act 1985 [74] that before any fishing vessel is constructed, approval (accompanied by the boat and engine specifications) should first be obtained from the Director General of Fisheries. The objective of this provision is to control on the size (GRT) of the boats and the HP of the engine and hence on the fishing efficiency. This applies for both the construction of new boats as well as for the replacement purposes (from old to new boats). Furthermore, before the annual fishing licenses are renewed, each individual boat is first inspected every year to ensure that the boats and engines are not replaced without permission. Therefore, the fishing power and capacity of the boats are controlled at all time.

The Problem of Enforcement.

Perhaps no management problem is more difficult other than that of enforcement by the fishery administrators.

Prior to I980, enforcement was haphazardly executed by the State Directors of Fisheries. The result was that there was little or no coordination at all with other government agencies assisting in the enforcement activities. Furthermore, the enforcement authorities concerned have long been facing with the problems of insufficient staff, lack of trained enforcement personnels and inadequate enforcement facilities such as patrol boats and stores for arrested vessels.

However, in I980 the enforcement unit of the Fisheries Department was enlarged. It was reorganized into four regionally based subcenters, three on the west coast and one on the east coast of the peninsular. Presently, the number of patrol vessels and speed boats available are 3I and 39, respectively (Appendix I5). There is a close liason between the Marine Police, the Navy and the Fisheries Department. All the three agencies are responsible for the enforcement of fishery regulations in the territorial sea and EEZ. To facilitate such activities, ad hoc committee was formed in I98I at Headquarters in Kuala Lumpur and at the regional bases in the states.

One of the main problems pertaining to fisheries enforcement is the interference by the politician. This has prevented enforcement officers and fishery administrators from carrying out their duties effectively and efficiently. Unless and until

the politicians change their attitudes and support the effort of fishery administrators to enforce the regulations, effective management will never be achieved.

In one instance, the enforcement unit of the Fisheries Department took special operative actions and arrested I4 trawler boats caught infringing and operating illegally in the areas of I to I.5 mile zone from the shore. However, because of the political interference, all the boats were only compounded to nominal sums and then released.

Another problem of enforcement is the lack of facilities to maintain the arrested boats. As a result, the arrested boats were normally released on nominal bonds by the court. These boats more often than not proceeded to continue their illegal fishing. Sometimes the boats were not surrended to the authorities when they were directed by the court to be confiscated. Court actions normally take a long period of time, that is a period of one to two years after the arrest of the boats.

Lack of Coordination Within The Fisheries Agencies And With Other Agencies.

The fishery sector is part of the country's ecosystem. Therefore. it is subjected to the prevailing environmental, economical, social and political conditions in the community and society at large. The success of management programs

cannot depend on implimenting them per se in isolation. However, it would have to take into account the interplay of other activities within and outside the fishery sector.

In Malaysia, one of the main problems in the fishery management programs is the poor linkage between the Fisheries Research Institute, the Statistic Section and the Management Section within the Fisheries Department itself.[76] It is important that there need to be a close linkage and rapport between these three sections. The Management Section needs much more regular and up-to-date informations pertaining to resource and fishery. On the other hand, the Research and Statistic sections need to be more closely focussed on providing these required informations.

The concept of overcapacity had been accepted by the Malaysian Government in general. But, in the implimentation stage what was absent was the total commitment to the policy at all levels. Part of the blame was due to the non-involvement of other agencies right from the planning to the implimentation stage. There should be a specific body at high enough level (e.g. the Prime Minister Department) to direct and coordinate the necessary actions of the various government agencies and ministries. Furthermore, the state governments should be invited to participate in this program, because they could play an important role in especially the reallocation of surplus fishermen.

C H A P T E R VIII

C O N C L U S I O N.

8. CONCLUSION.

The need for effective implimentation of the fisheries management measures is important. From the foregoing discussions, it is clear that numerous obstacles and constraints confront the fishery administrators. Such constraints would inevitably prevent them from effectively implimenting the measures.

The major obstacle to the successful implimentation of the measures lies in the lack of political support. Without such support, fishery administrators will find it difficult to adopt and impliment the management measures. The gaining of such support is an important step for the fishery administrators.

One of the ways to gain the political support as well as the support from the fishermen is to form a Fishery Coordination Committee. The members of the committee are comprised of representatives from fishermen (fishermen associations), fish processing sectors, fish dealers, local politicians, state officials, officials from other relevant agencies and ministries, and the fishery officials (administrators, scientists, statisticians). To ensure fairness to all groups of fishermen concerned, the committee should elect among the fishermen the representatives from the traditional, trawlers, and purse-seiners fisheries. Representatives from publics such as lawyers, professors,

and other professional groups could also be invited to participate in the work of the community.

The broad task of the community is to ensure (I) the rational utilization of fishery resources to prevent overfishing. This would include determination of optimal yields of the resource and total allowable level of foreign fishing in EEZ waters of Malaysia; (2) equitable distribution of fishing grounds between the traditional and commercial fishermen; and (3) harmonious co-existence among the different groups of fishermen.

The functions of the committee should be executed in a most democratic manner. In other words, the requests, proposals and ideas of the fishermen representatives in the committee should be taken into considerations. The possible implications of different decisions on the parties concerned can be discussed and debated. Through this process it is believed that some compromises could be made by the committee. In this way, the committee can work out the management objectives which will serve as useful guidelines for decisions. In short, any management or regulatory measure which is jointly accepted could be implimented more successfully than that which is undertaken in isolation.

Another management measure worth considering is the establishment of territorial use right of fishing (TURF)

for the traditional fishermen.[77] The basic idea of the TURF is to protect the inshore fishery from the infringement by other fisheries. This is important since the traditional fishermen are generally socio-economically inferior and powerless relative to the commercial fishermen.

TURF would provide exclusive property right to the fishermen to whom it was granted. Perhaps the fishermen must be able to participate in this program effectively. As a result, the area could be protected by the law from invasion and infringement of any other parties. To avoid any abuses, once TURF is granted to the fishermen, it is not allowed to be rented, transfered or morgaged. Furthermore, TURF should clearly define the fishing areas and gears to be employed by the fishermen. TURF is therefore grants sole ownership to fishermen as opposed to the common-property ownership.

Under TURF, conservation and regulation should not be much of a problem anymore. Fishermen, will on their own decide how much fishing effort or input should be put in, how much fish should be harvested, and what is the minimum size limit of fish to be caught, in order to conserve the resources. In addition to this, TURF may minimize the activities of the enforcement machineries. This is so, because the fishermen themselves would voluntarily protect the fishery resources and fishing grounds allocated to them.

It cannot be ignored however that there are numerous political, social and economic implications to the TURF system. Some of which may be undesirable. Nevertheless, the system has been successfully implimented in Japan, Korea and Taiwan.

There is an urgent need to look into compensation for the reallocated fishermen, especially for the minitrawlers (less than 10 GRT) who presently should fish beyond 5 miles limit. In this context what would be initially required is a survey on the economic profile of such fishermen.

There is also an urgent need to develop the capability of the management research and statistic personnels. This could be done by providing them with the necessary facilities and training. Presently very low priority is given to this important aspect. We cannot hope to implimemt successful management policies without the presence of properly trained mainpower.

It is without doubt that the fishing efforts in Malaysia are excessive. A shortfall of the necessary support and a lack of trained personnels for the management measures proposed should not be an excuse for delaying action. Nevertheless, there is a need for Malaysia to seriously study the various impediments faced by the fishery administrators

and find the solutions to such problems. This is important to ensure the effectiveness of implimentation of the management measures.

Pertaining to fishing in EEZ waters, there is a need for Malaysia to have a reliable data base in order for the country to fulfill the international responsibilities under UNCLOS III. Presently, there is a paucity of reliable informations on the viability and potential of fisheries resources in waters beyond 30 miles from the coast. Essential data such as the fishing grounds, seasonal distribution and extension of fishing effort are lacking.

The data can be obtained either by specific survey cruises by research vessels, or by computing data from the operational results of both domestic and foreign vessels fishing in the EEZ.

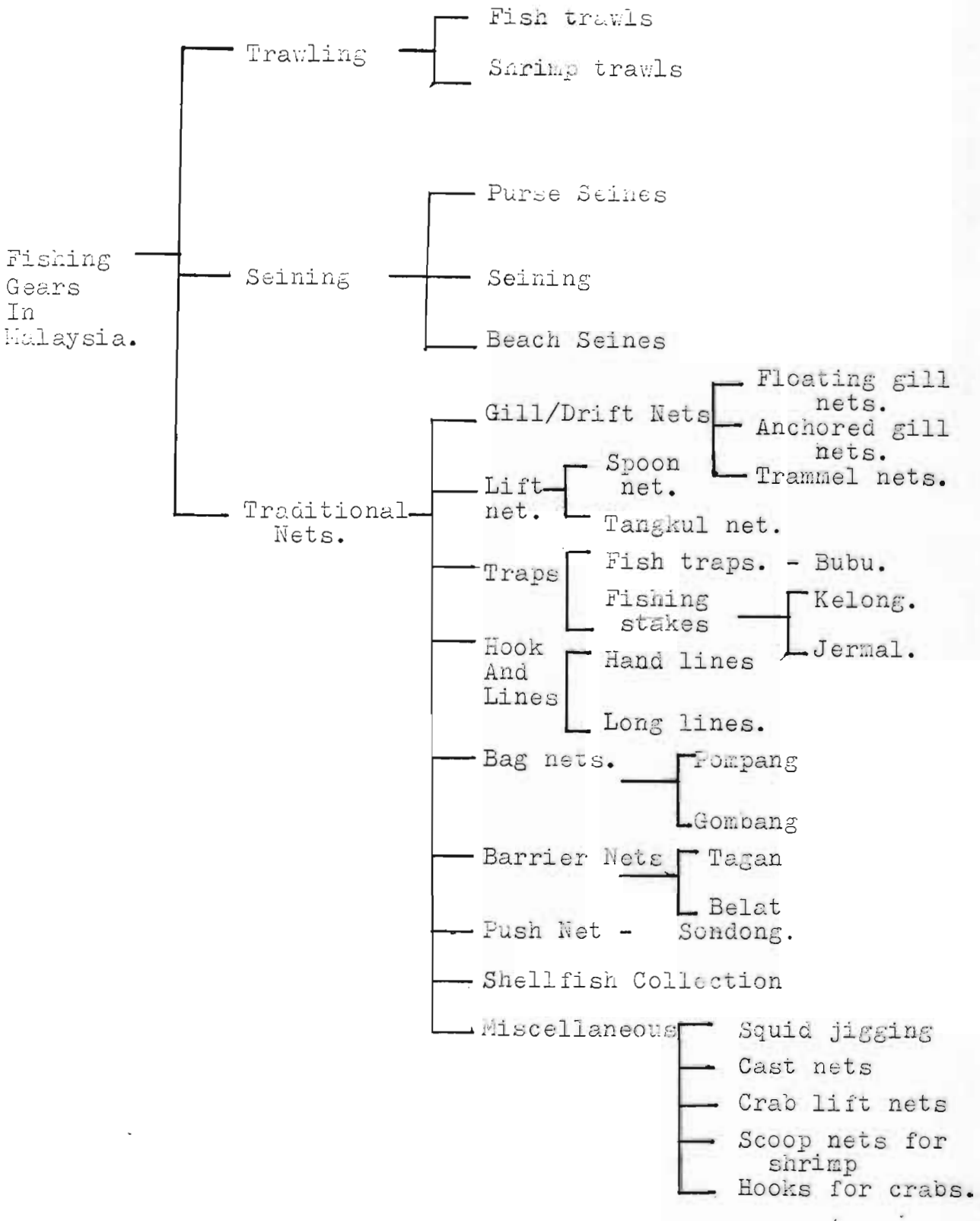
In order to manage the resources in the EEZ rationally without overexploitation, there must be a control over both illegal and licensed vessels fishing in the EEZ. The objective is to ensure that they fish only in authorized areas of fishing.

C H A P T E R IX

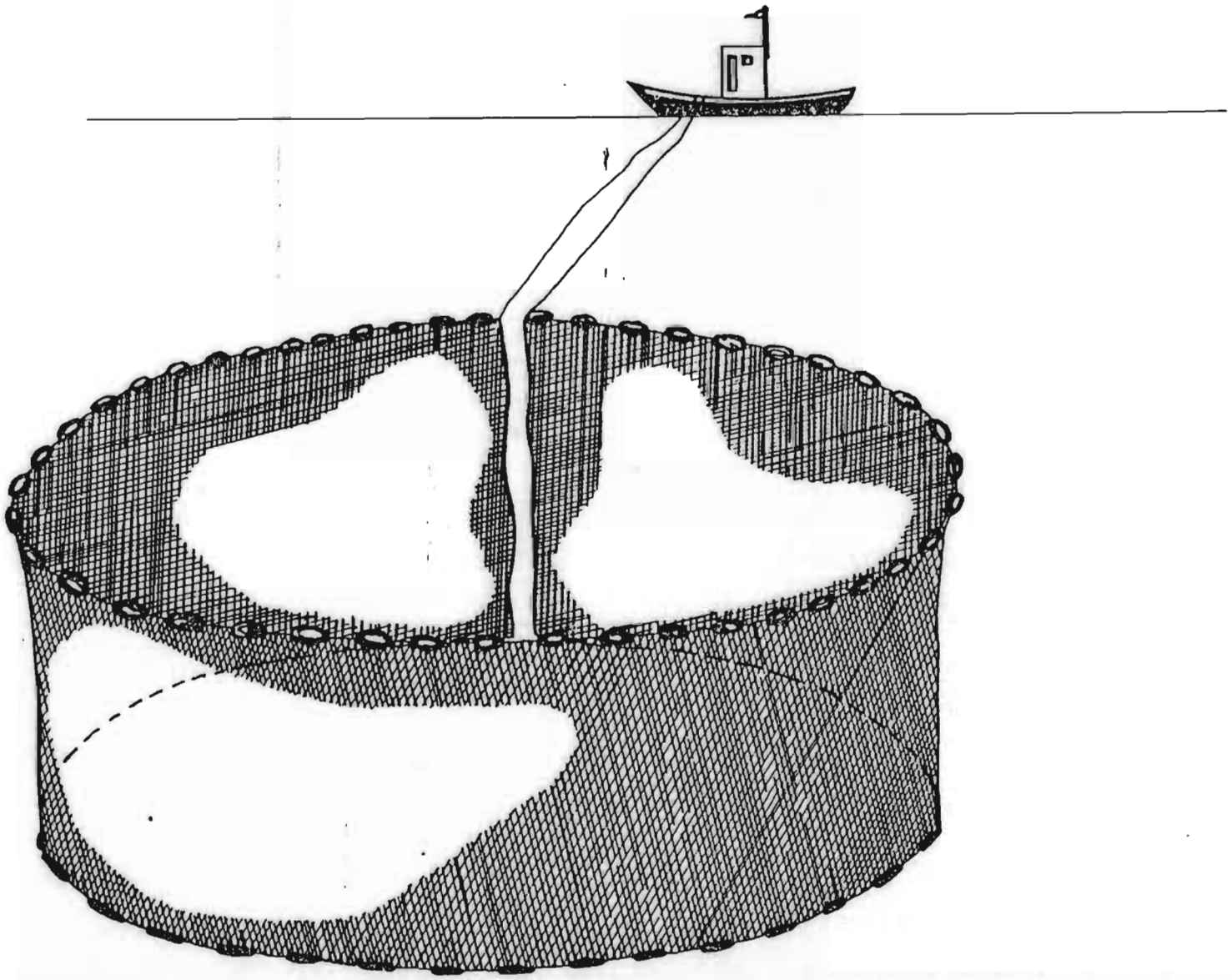
A P P E N D I X E S.

Appendix I

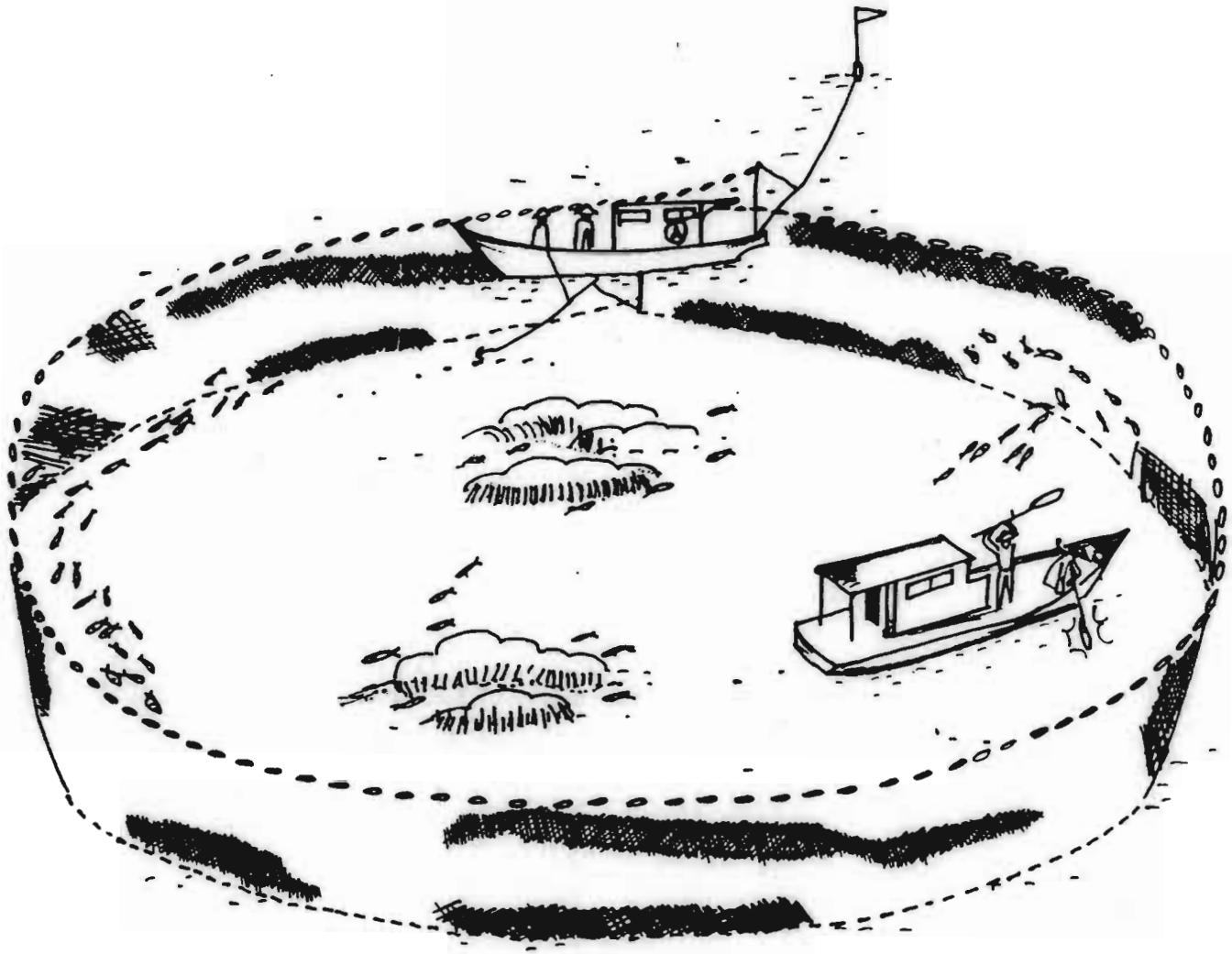
Classification of the fishing gears in Malaysia.



Appendix 2(g)

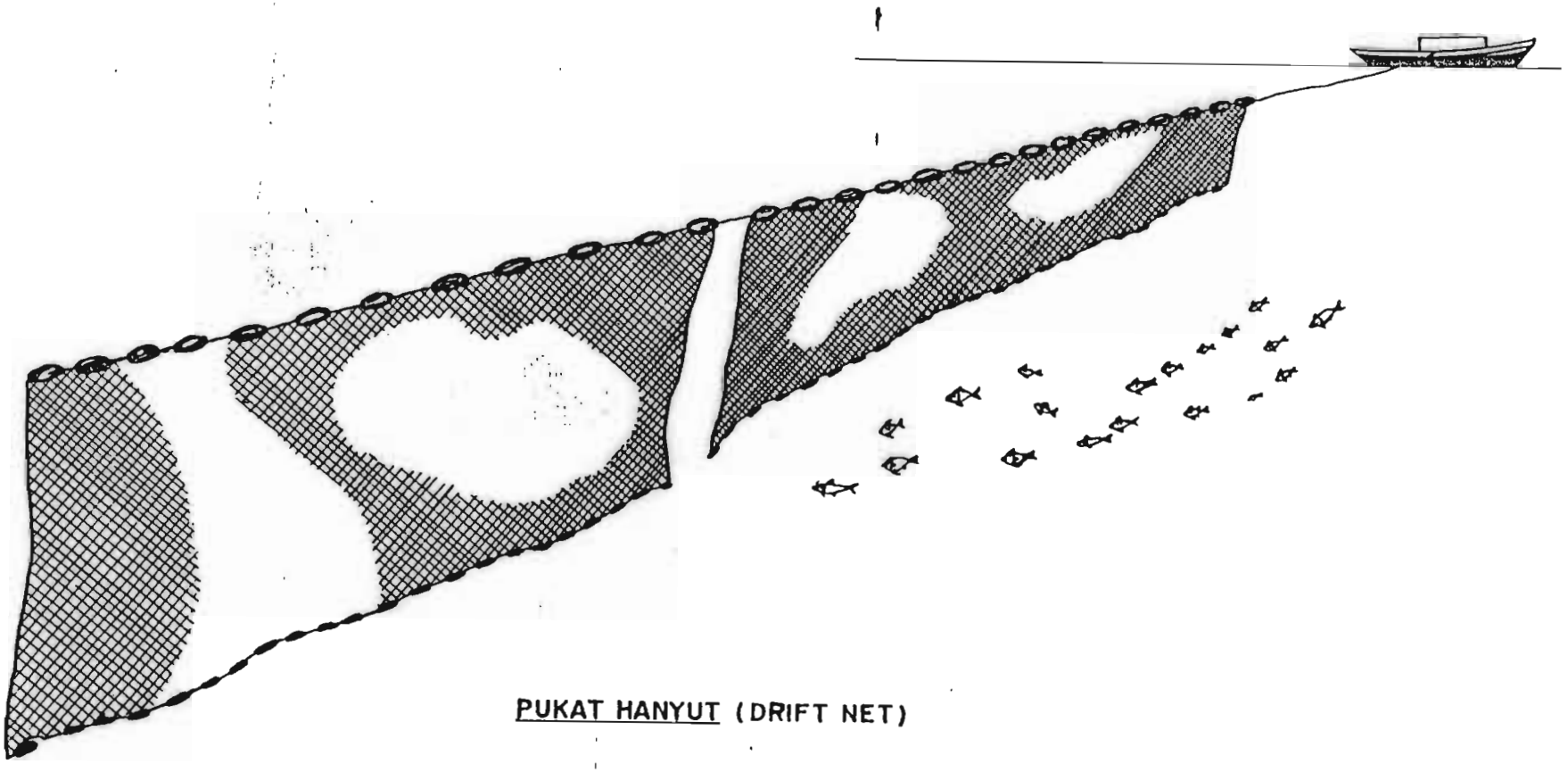


Appendix 2(b)



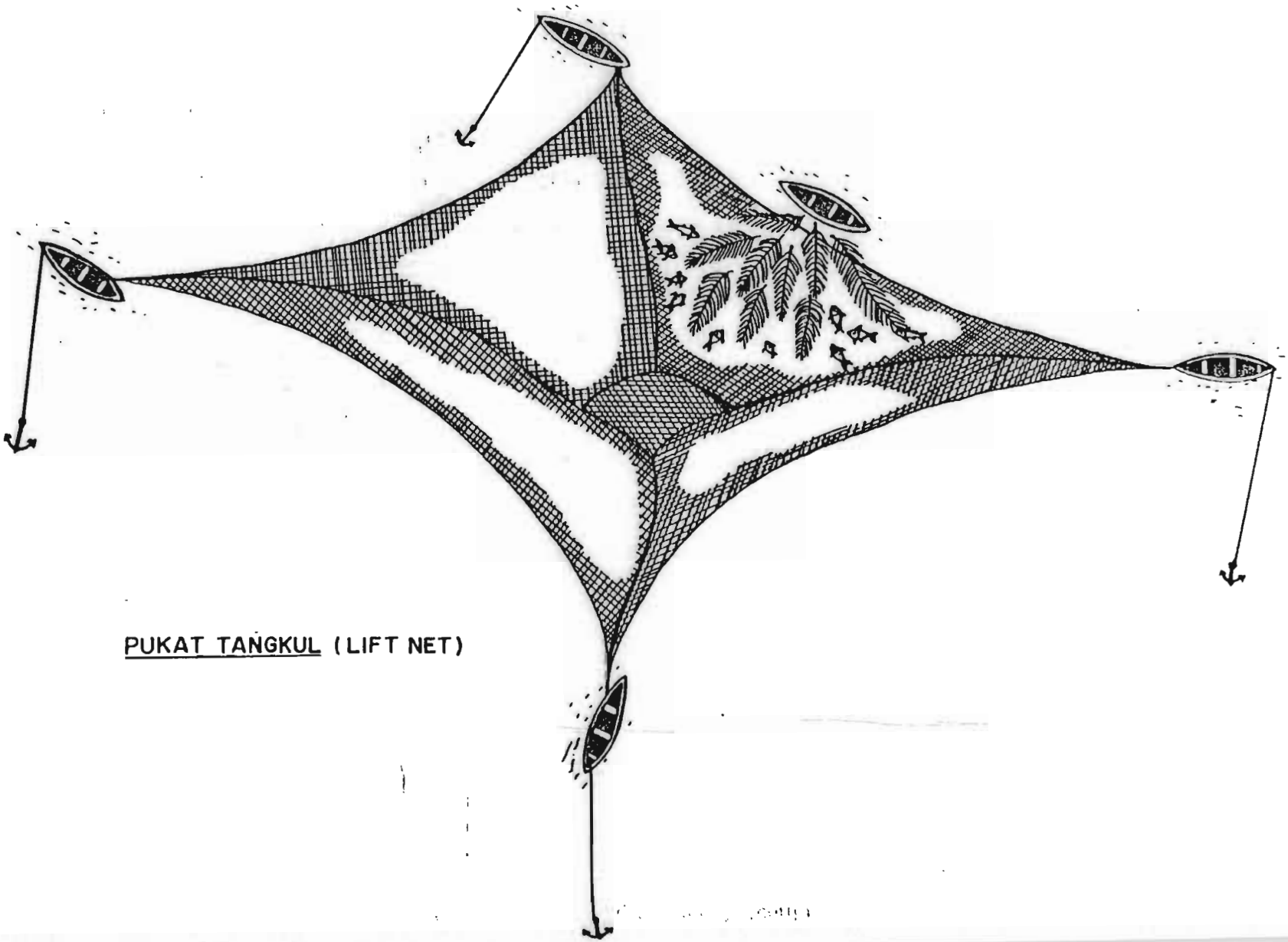
OPERATION OF GILLNET.

Appendix 2.(c)



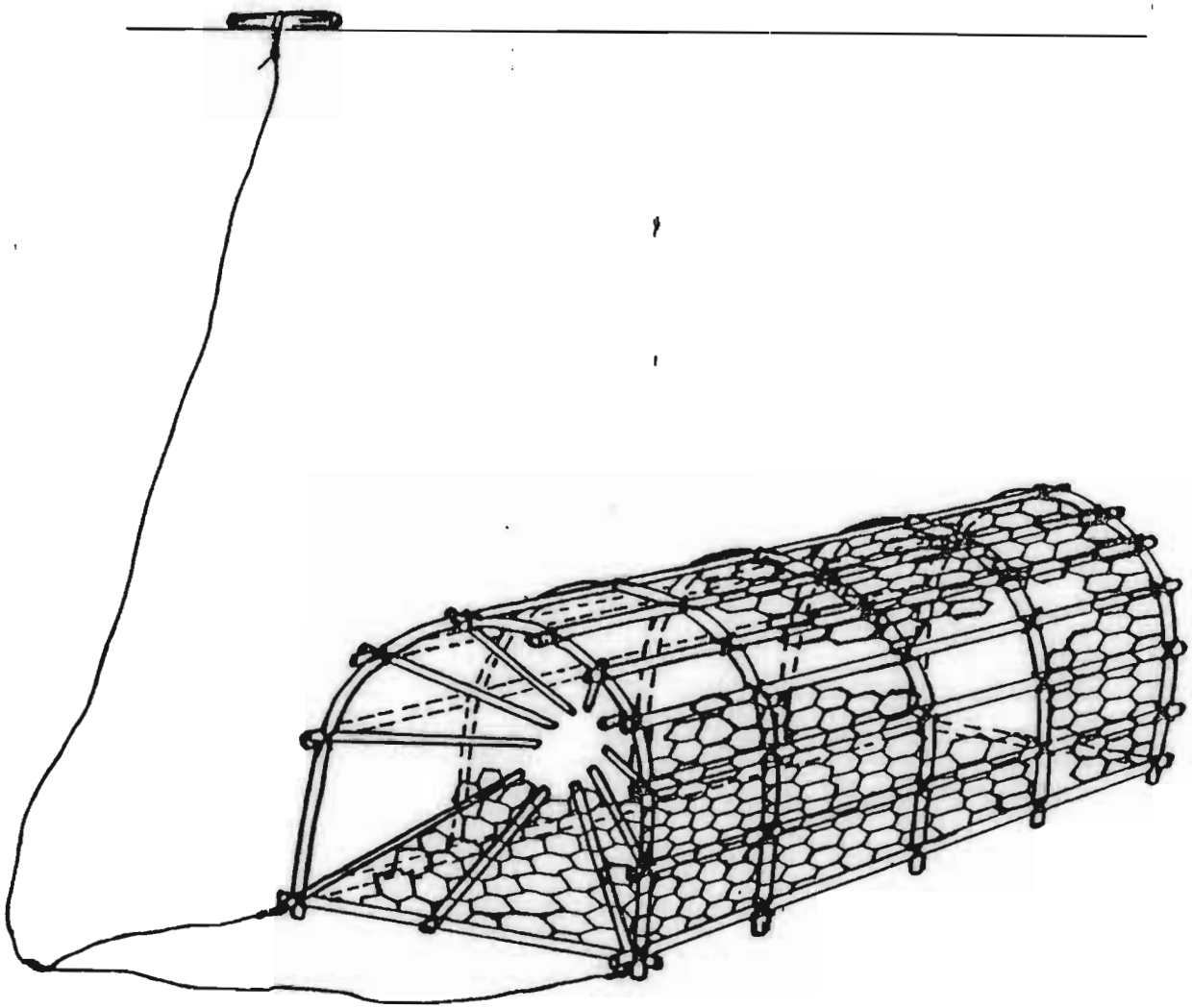
PUKAT HANYUT (DRIFT NET)

Appendix 2(d)



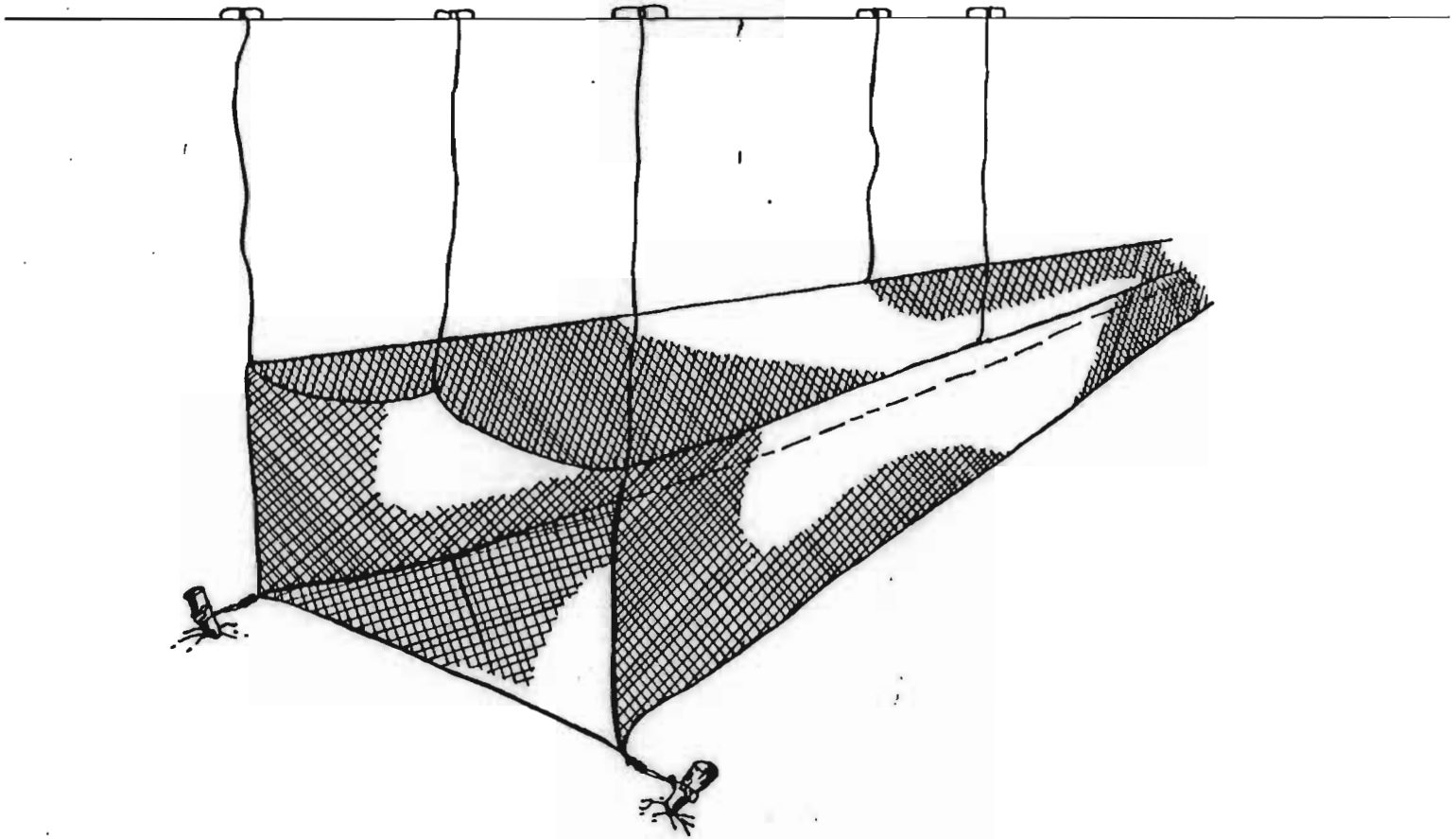
PUKAT TANGKUL (LIFT NET)

Appendix 2(e)



BUBU (traps)

Appendix 2(f)



POMPANG (TRAPS)

Appendix 3

Types Of Commercial Marine Fish In Malaysia.

I. PELAGIC FISH

a) long tail snad.
b) mullet.
c) mackerel e.g. Indian mackerel, barred spanish mackerel.
d) scad - e.g. hard tail scad, big eye scad, round scad.
e) herring - e.g. wolf herring.
f) sardines
g) anchovy
h) tuna, billfish

2. DEMERSAL FISH

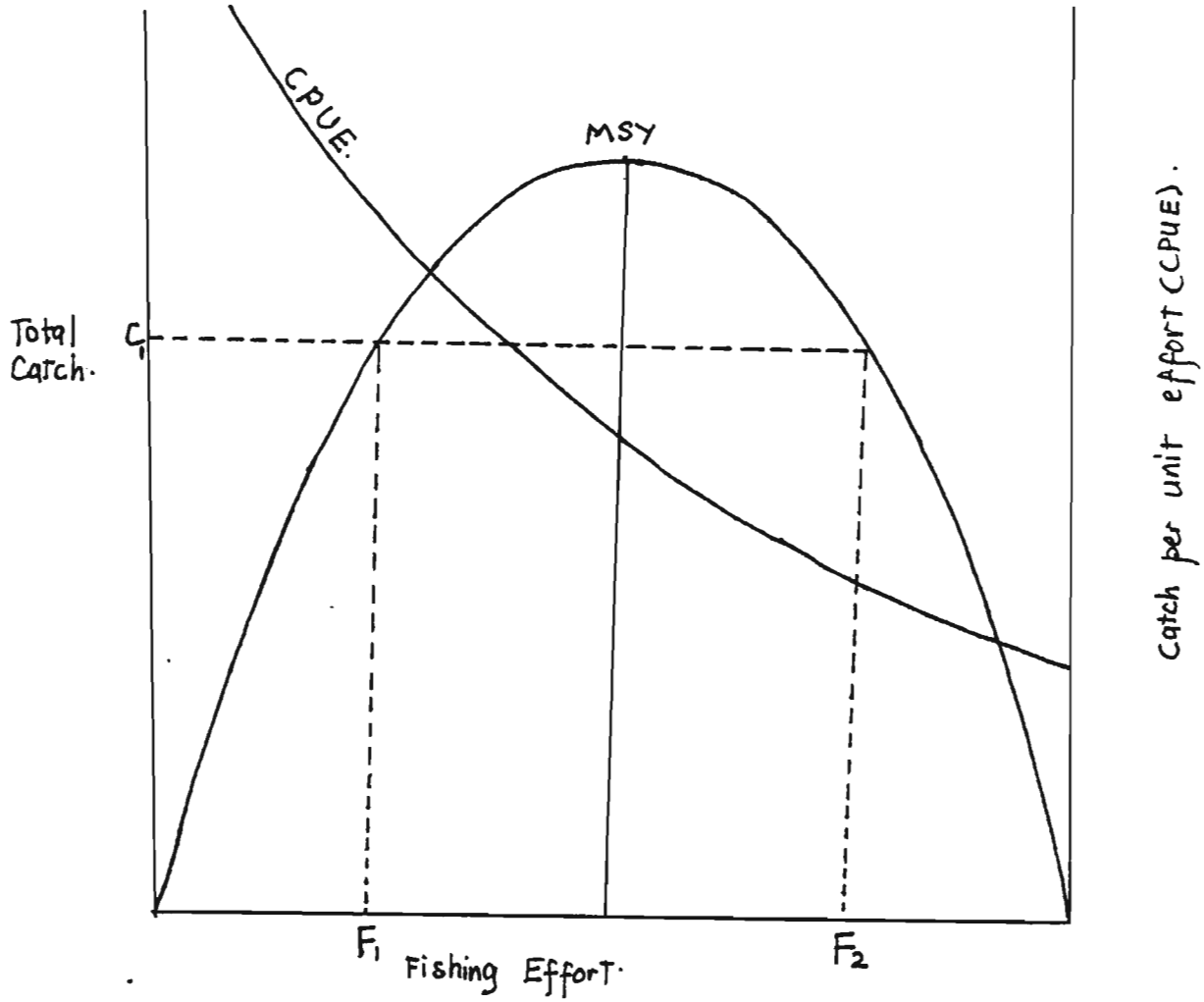
a) red fish.
b) snapper - e.g. mangrove snapper.
c) bass - e.g. sharptoothed bass.
d) eel
e) flatfish
f) giant sea perch
g) rays

3. CRUSTACEAN - e.g. crabs, lobsters, shrimp.

4. MOLLUSCS - e.g. oysters, mussels, clam, cockles, squids.

Appendix 4

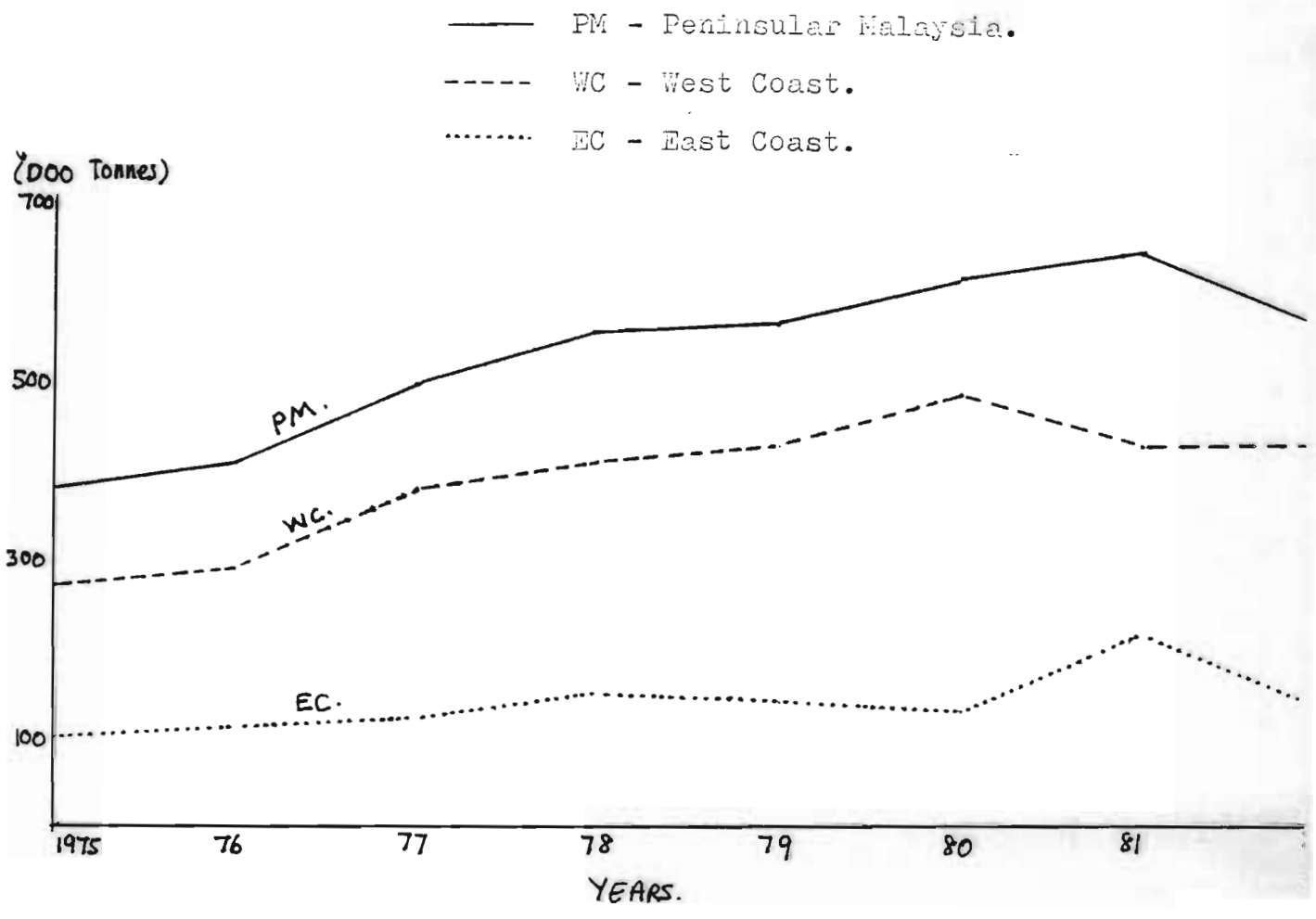
Total Catch/Fishing Effort And CPUE/Fishing Effort Relationships.



Appendix 5

Landing of marine fish (tonnes) in inshore areas of the Peninsular.

Year	Peninsular Malaysia		Total
	West Coast	East Coast	
I975	270,664	I04,570	375,234
I976	294,575	II6,389	4I0,964
I977	377,867	I20,086	497,953
I978	4I0,773	I54,I24	564,897
I979	432,347	I38,557	570,904
I980	493,495	I30,403	623,898
I98I	433,37I	2I5,944	649,3I5
I982	433,987	I33,337	567,324



Appendix 6

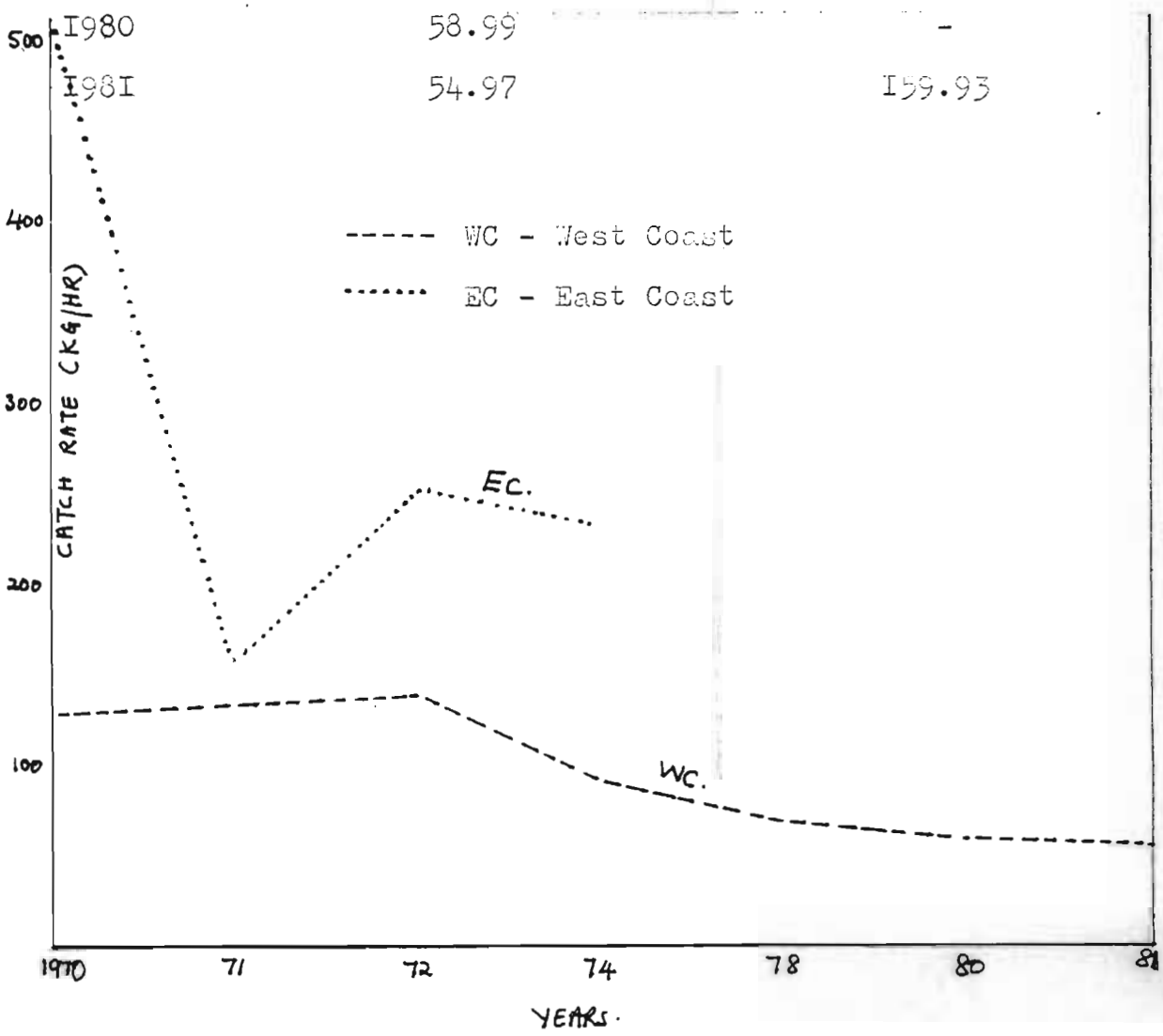
Annual Landings (tonnes) of Demersal Fish On The West Coast of Peninsular Malaysia. I970-I980.

Years	Demersal Fish landings. (tonnes)	Trawl landings. (tonnes)	% of Trawl landings.
I970	I00,029	68,728	68.7
I97I	II8,7I4	94,764	79.8
I972	I35,347	94,973	70.2
I973	I65,067	I25,798	76.2
I974	I86,762	I52,8I6	8I.8
I975	I74,7I2	I47,353	84.3
I976	I92,868	I75,595	9I.0
I977	250,3I7	226,52I	90.5
I978	256,095	235,346	9I.9
I979	230,3I6	2I0,76I	9I.5
I980	209.889	I93,973	92.4

Appendix 7

Catch Rates (Kg/Hr) From Demersal Resource Surveys Conducted By The Fisheries Research Institute, Penang, Malaysia.

Years	Peninsular Malaysia.	
	West Coast.	East Coast.
I970	I3I.I0	5I5.60
I97I)	I4I.67	I66.63
)		
I972)		254.77
I974	92.09	238.I0
I978	69.39	-
I980	58.99	-
I98I	54.97	I59.93

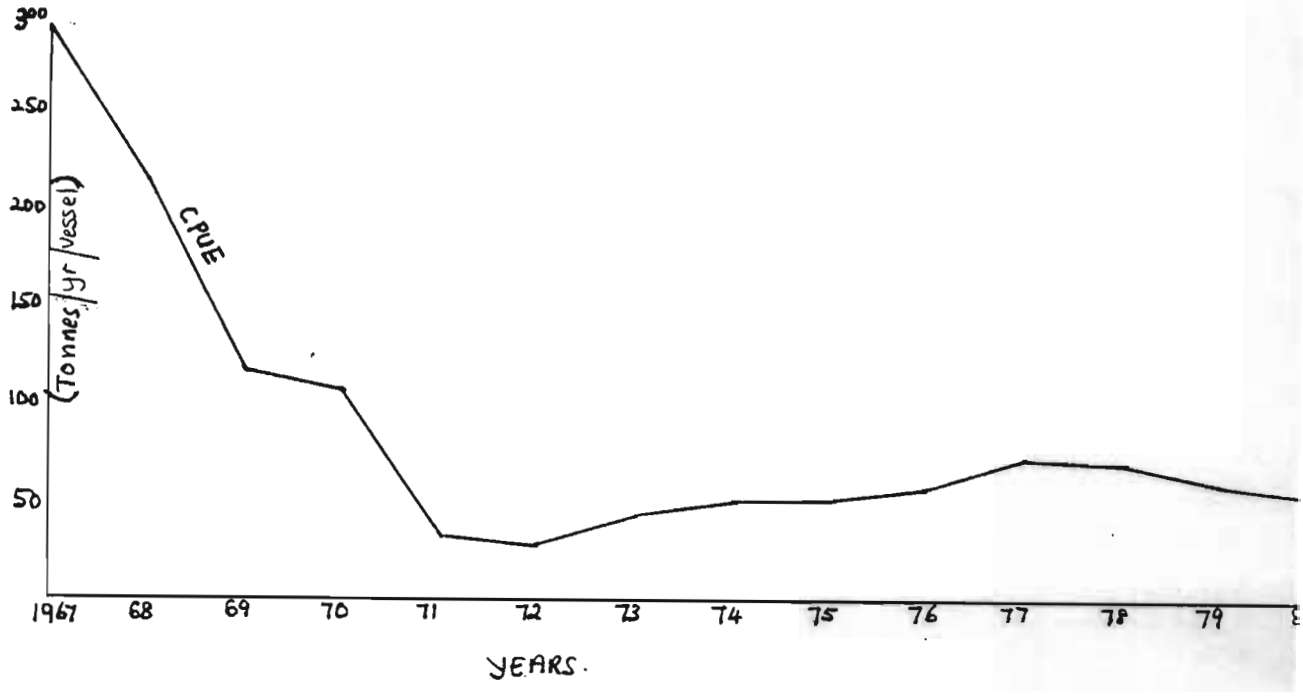


Appendix 8

Estimated CPUE For Trawl Fishing On The West Coast, I967-I980.

Years	Catch (tonnes/year)	Effort (vessels*/year)	CPUE (tonnes/yr/vessel)
I967	54,474	I80	302.6
I968	58,762	264	222.6
I969	48,853	367	I33.I
I970	68,728	599	II4.7
I97I	94,764	2,594	36.5
I972	94,973	2,846	33.4
I973	I25,798	2,897	43.4
I974	I52,8I6	2,928	52.2
I975	I47,353	2,8I5	52.3
I976	I75,595	3,039	57.8
I977	226,52I	3,029	74.8
I978	235,346	3,32I	70.9
I979	2I0,76I	3,3I6	63.6
I980	I93,073	3,347	57.7

* Based on licensed fishing boats.



Appendix 9

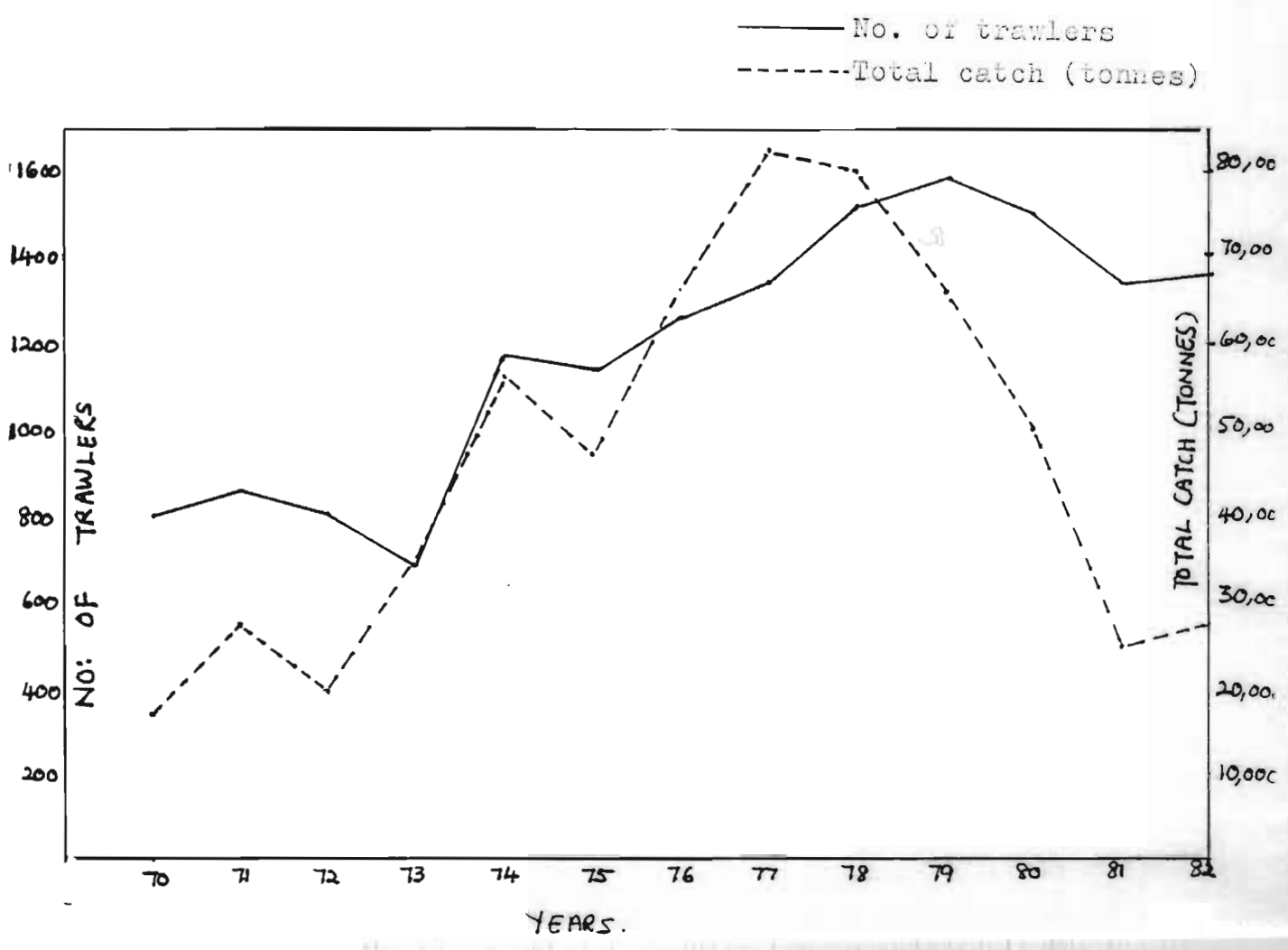
Composition Of Trawl Landings
On The West Coast (tonnes)
I970 - I980.

Years	Total	Commercial Fish		Trash Fish	
		tonnes.	%	tonnes.	%
I972	94,973	45,775	48.0	49,I98	52.0
I973	I25,798	56,658	45.0	69,I40	55.0
I974	I52,8I6	58,208	38.0	94,608	62.0
I975	I47,353	60,355	4I.0	86,998	59.0
I976	I75,595	86,087	49.0	89,508	5I.0
I977	226,52I	II0,005	49.0	II6,5I6	5I.0
I978	235,346	I27,2I9	59.0	I08,I27	46.0
I979	2I0,76I	99,294	47.0	III,467	53.0
I980	I93,973	82,36I	42.5	III,6I2	57.5

Appendix IO

Number of trawlers operating and trawlers' catch in Selangor (I970 - I982).

Years	No. of trawlers.	Trawlers' catch (tonnes).
I970	800	I7,500
I97I	858	27,500
I972	808	20,000
I973	688	35,000
I974	II70	56,250
I975	II35	47,500
I976	I263	66,250
I977	I335	82,500
I978	I5I7	80,000
I979	I587	66,250
I980	I509	50,000
I98I	I345	25,000
I982	I366	27,500

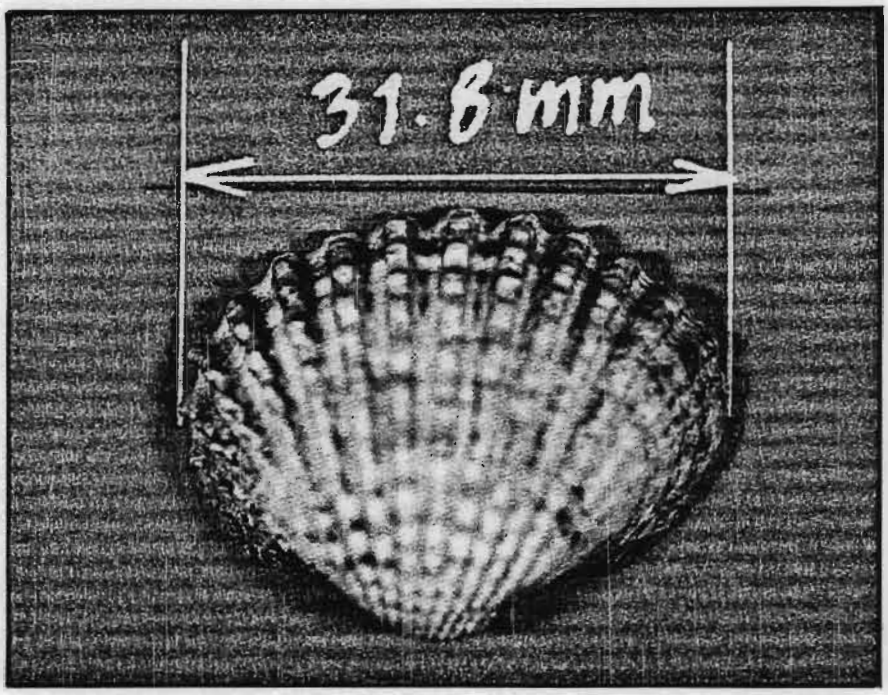


Appendix II.

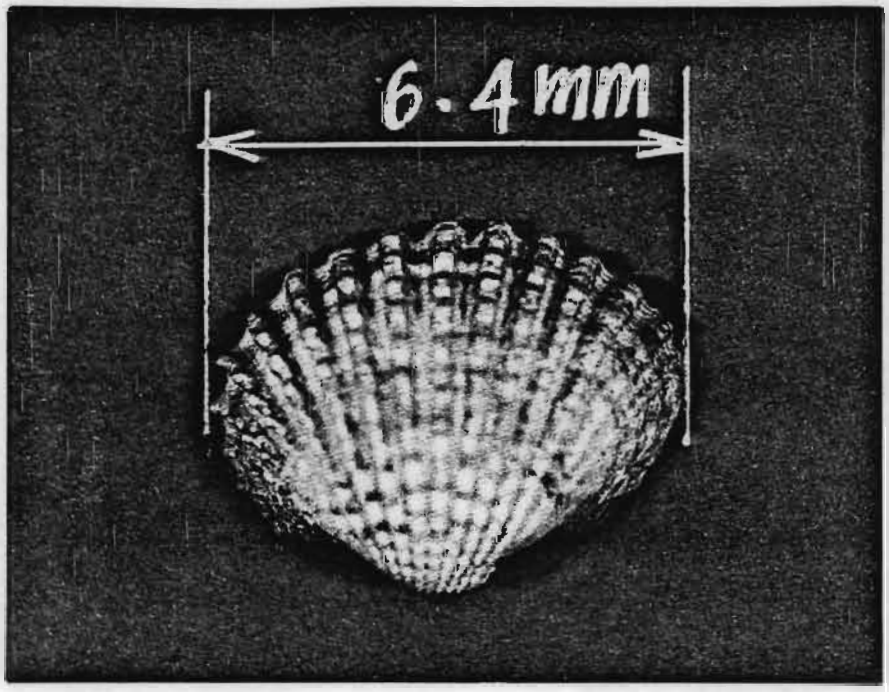
Estimate of resource potentials in East Coast of Peninsular Malaysia.

Area	Types of resources.	Years	Estimated (X I,000 tons) 50 m. depth.	Sources
East Coast, Peninsular Malaysia.	Pelagic	I974	I03	Menasveta[40] et al I974
	Pelagic	I976	60	Chong[4I] I976
	Pelagic	I976	56 - 75	Pathansali[42] I976

Appendix 12.

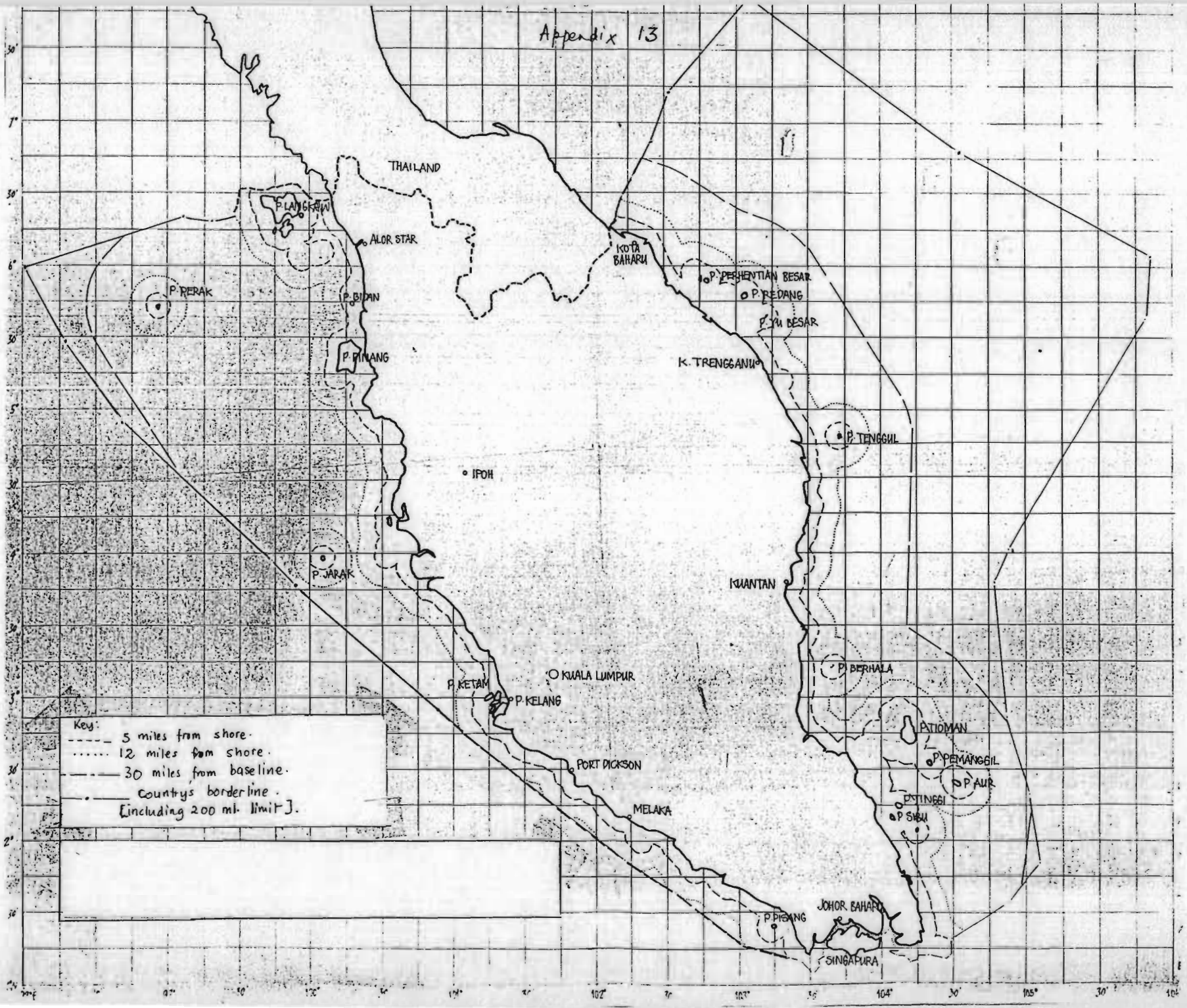


Cockle (*Anadara granosa* L)



Cockle (*Anadara granosa* L)

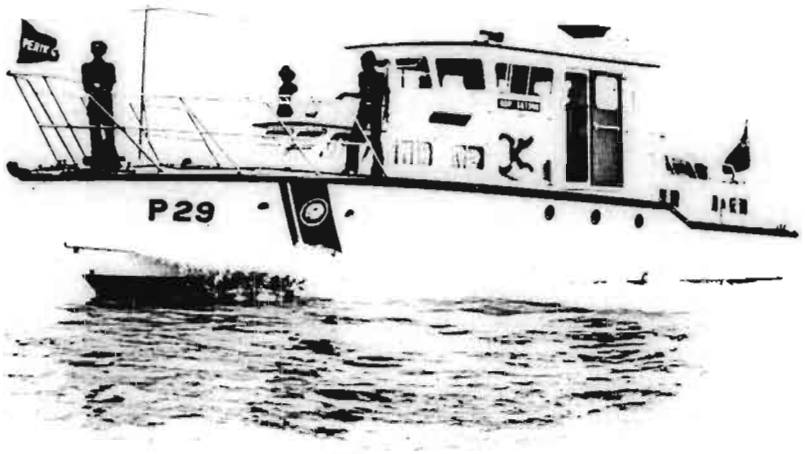
Appendix 13


THAILAND
P. LANGKAWI
ALOR STAR
KOTA BAHARU
P. PERHENTIAN BESAR
P. REDANG
P. TU BESAR
K. TRENGGANU
P. PERAK
P. BIDAN
P. PINANG
P. TENGGUL
IPOH
P. JARAK
KUANTAN
P. BERHALA
KUALA LUMPUR
P. KETAM
P. KELANG
P. TIOMAN
P. PEMANGGIL
P. AUR
PORT DICKSON
P. TINGGI
P. SIBU
MELAKA
JOHOR BAHARU
P. PISANG
SINGAPURA
Key:
5 miles from shore.
12 miles from shore.
30 miles from baseline.
Country's borderline.
[including 200 mi. limit].

Appendix I4.

Name Of Islands To Be Turned Into Marine Park Or Marine Reserve.

Appendix 15.



A Patrol Vessel.

A Speed Boat.

C H A P T E R X

F O O T N O T E S.

FOOTNOTES.

I. C. Radonski and Robert G. Martin; "Fisheries Advances Since Thirties". Fisheries, A. Bulletin of the American Fisneries Society, May - June I985. P. 2.

2. 'Malaysia' in this paper refers only to the Peninsular Malaysia, excluding Sabah and Sarawak.

3. Mohamad Ibrahim, "The Malaysian Fishing Gears And Methods." Major Paper for M.M.A. Program, I980, P. I.

4. Shahrom Abd. Majid I983, "Controlling Of Fishing Effort: Malaysias Experience And Problems. "Paper presented at the Expert Consultation On The Regulation Of Fishing Effort; FAO, Rome, P. I.

5. Ibid.

6. Annual Fisheries Statistics I967 - I98I. Ministry of Agriculture, Kuala Lumpur, Malaysia.

7. Annual Fisheries Statistics I982. Ministry of Agriculture Kuala Lumpur, Malaysia. P. IO.

8. Ibid., P. 34.

9. Ibid. This is the latest publication of the annual statistic available.

IO. Ibid.

II. Supra note 3, P. II.

I2. Supra note 7. P. I0.

I3. Report by FAO. Indo-Pacific Fishery Commission Proceedings, I980.

I4. Supra note 7. P. I.

I5. Ibid., P. 34.

I6. Ibid. P. 230 - 23I.

I7. Ibid.

I8. Mazlan Jusoh. "Management of Marine Fisheries Resources. "Department of Fisheries, Ministry of Agriculture Malaysia. Paper presented in a seminar in University of Agriculture Malaysia, I985. P. 3.

I9. Mohd. Azmi Ambak, et. al. "Assessment of the Demersal Stocks Off Kelantan, East Coast of Peninsular Malaysia." Pertanika 4 (2), I98I. P. I56 - I59.

20. Ibid., P. I56.

2I. Ibid., P. I56.

22. Supra note I8.

23. Supra note 7. P. 2I9.

24. Supra note 4. P. 2.

25. Annual Fisheries Statistic I968, Ministry of Agriculture, Kuala Lumpur, Malaysia.

26. Annual Fisheries Statistic I970 - I980, Ministry of Agriculture, Kuala Lumpur.

27. Anon I976. Report Of The Workshop On The Fisheries Resources Off The Malacca Straits: Part 2. SCS/Gen/76/6. South China Sea Fisheries Development And Coordination Programs, Manila.

28. Lam, W.C. and Pathansali, D. I977. "An Analysis Of Penang Trawl Fisheries To Determine The Maximum Sustainable Yield." Fisheries Bulletin No. I6, Ministry of Agriculture, Malaysia.

29. Mohd. Shaari Sam Abdul Latif, I974: "Demersal Fish Resources Surveys And Problems Of Fisheries Resources Management." Fisheries Bulletin No: I5, Ministry of Agriculture, Malaysia.

30. The data was obtained from The Fisheries Research Institute, Penang, Malaysia.

3I. Annual Fisheries Statistic I967-I980. Ministry of Agriculture, Kuala Lumpur, Malaysia.

32. Supra note 29.

33. Khoo Kay Huat (I978). "Implimentation of Regulations For Domestic Fishermen," in Christy F.T. (ed.) Proceedings of the ICLARM/ISEAS Workshop On The Law Of The Sea, Manila, I978.

34. Annual Fisheries Statistic, I972 - I980. Ministry of Agriculture, Kuala Lumpur, Malaysia.

35. Jones (I976). "Mesh Regulation In The Demersal Fisheries Of The South China Sea Fisheries Programs. SCS/76/WP/34.

36. Annual Fisheries Statistics, I970 - I982. Ministry of Agriculture, Kuala Lumpur, Malaysia.

37. Yeh S.A., Low L.L. And Liu H.C. I98I: "Assessment On Groundfish Resources In The Sunda Shelf Area Of The South China Sea." Acta Oceanographics Taiwanica No. I2, P. I75 - I89.

38. Supra note 30.

38 (a) Annual Fisheries Statistics, I979 - I980. Ministry of Agriculture, Kuala Lumpur.

39. Mohd. Azmi Ambak and A.K. Mohamad Mohsin, I982. "Assessment Of The Tranlable Demersal Stock Off The East Coast Of Peninsular Malaysia." MALAYS. Appl. BIOL. II(2). P. I35 - I4I.

40. Menasveta D., Shindo S., and Chullasorn S. 1974: "Pelagic Fishery Resources Of The South China Sea And Prospects For Their Development." SCS/DEV/73/6/Rome. FAO, Rome. Italy.

41. Chong B.J. 1976: "The Status Of Pelagic Fishery Resources In Malaysia." Fisheries Bulletin No. 15, Ministry of Agriculture, Malaysia.

42. Pathansali D. 1976: "Assessment Of Potential Yields from The Coastal Marine Fisheries Resources Of Malaysia." Fisheries Bulletin No: 15, Ministry Of Agriculture, Malaysia.

43. Supra note 37.

44. Anonymous 1978: "Report Of The Workshop On The Demersal Resources Of The Sunda Shelf." Part I. SCS/Gen/77/12. South China Sea Fisheries Development And Coordinating Program. Manila, Phillipines.

45. Fisheries (Maritime) Regulations 1980 (Amendment). Schedule 5, Regulation 4(4).

46. Jahara Yahya, 1983. "The Management And Regulation Of Capture Fisheries In Peninsular Malaysia - Issues And Problems". An International Conference On Development And Management Of Tropical Living Aquatic Resources. P. 8.

47. Ibid., P. 9.

48. Laws of Malaysia, Act 317, Fisheries Act 1985. Part I Sec. 2. P. 8 - 13.

49. Ibid. Part X, Sec. 62. P. 44.

50. FAO 1982. Special Problem Of Small Scale Fisheries.

51. The objective of the New Economic Policy is to expand equity, employment, and educational opportunities for the economically disadvantage "Bumiputra" (ethnic Malays and other indigenous groups).

52. Fisheries Department Of Malaysia, 1982. "Implimentation Of New Licensing Policy." Unpublished.

53. Supra note 48. Part VI, Sec. 31. "Compounding Of Offenses." P. 28.

53 (a) Ibid., Part VI. Sec. 25 (b). "Offenses Under The Act." P. 26.

(b) Ibid., Part VI, Sec. 34 "Court May Order For Forfeiture Of Seized Vessels In Certain Circumstances." P. 29.

54. In Indonesia, this gear has been completely banned.

55. "New Agriculture Policy!" Ministry of Agriculture, Kuala Lumpur, Malaysia. 1984.

56. Biliano Cicin-Saen. "Evaluation Criteria For Making Limited Entry Decision." P. 246.

57. Report by FAO. Indo-Pacific Fishery Commission Proceedings, I980. "Country Status Report On Malaysia Fisheries." P. 181.

58. Ibid. P. I83.

59. The Fisheries (Prohibition of Methods of Fishing, Regulations, I97I.

60. Department of Fisheries, Malaysia I985. "Briefing to Kedah State Government Pertaining to Development of Marine Park." Unpublished Paper.

6I. Paper prepared by the Fisheries Department of Malaysia, I985. "The Policy and the Management Strategies To Offshore Fisheries." Unpublished. P. IO.

62. Ibid. P. II.

63. Fisheries Department of Malaysia, I985. "Agreement Relating To Foreign Fishing In The EEZ Of Malaysia And Cooperation In The Conservation And Management Of The Fisheries Resources Therein." Unpublished paper.

64. Supra note 6I.

65. United Nations Convention On The Law Of The Sea, I982.

66. Supra note 7. P. IO.

67. Supra note 4. P. I8.

68. Supra note 48. Part IV. Sec. 9(4). P. I5.

69. Supra note 4, P. I0.

70. Ibid.,

71. Supra note 46.

72. Ibid.

73. Supra note I8, P. 8

74. Supra note. 48, Part IV Sec. 9(I), 9(2), and 9(3).

75. Supra note 4, P. I9.

76. Ibid, P. I2.

77. Supra note 46. The idea was obtained from the paper "Fishery Regulation Adopted For Coastal And Offshore Fisheries In Japan." Tadashi Yamamoto. The paper was presented at the Expert Consultation On The Regulation Of Fishing Effort, FAO, Rome, I983.

C H A P T E R XI

R E F E R E N C E S .

REFERENCES.

I. Annual Fisheries Statistics I967 - I982. Ministry of Agriculture, Kuala Lumpur, Malaysia.

2. Anon I976, Report Of The Workshop On The Fisheries Resources Off The Malacca Straits: Part 2. SCS/Gen/76/6. South China Sea Fisheries Development And Coordination Programs, Manila.

3. Anonymous I978: "Report Of The Workshop On The Demersal Resources Of The Sunda Shelf. Part I SCS/Gen/77/I2. South China Sea Fisheries Development And Coordinating Program, Manila. Phillipines.

4. Biliano Cicin-Saen. "Evaluation Criteria For Making Limited Entry Decision."

5. C. Radonski and Robert G. Martin. "Fisheries Advances Since Thirties." Fisheries, A Bulletin Of The American Fisheries Society. May - June I985.

6. Chong B.J. I976. "The Status Of Pelagic Fisheries Resources In Malaysia." Fisheries Bulletin No: I5, Ministry of Agriculture, Malaysia.

7. Department of Fisheries. I985. "Briefing To Kedah State Government Pertaining To Development Of Marine Park." Unpublished Paper.

8. Department Of Fisheries, Malaysia. "Implimentation Of New Licensing Policy" Unpublished paper, I982.

9. Department of Fisheries, Malaysia. "The Policy And The Management Strategies To Develop Offshore Fisheries." Unpublished Paper.

IO. Department of Fisheries, Malaysia I985. "Agreement Relating To Foreign Fishing In The EEZ Of Malaysia And Cooperation In The Conservation And Management Of The Fisheries Resources Therein." Unpublished paper.

II. Fisheries (Maritime) Regulation I980 (Amendment), Malaysia.

I2. Fisheries (Prohibition Methods Of Fishing) Regulation, I97I.

I3. Fisheries (Cockles Conservation And Culture) Regulation, I964.

I4. FAO. Indo-Pacific Fishery Commission Proceedings, I980. "Country Status Report On Malaysia Fisheries."

I5. FAO Report. "Special Problem Of Small Scale Fisheries." I982.

I6. Jones (I976). "Mesh Regulation In The Demersal Fisheries Of The South China Sea Fisheries Programs." SCS/76/WP/34.

I7. Jahara Yahya, I983. "The Management And Regulation Of Capture Fisheries In Peninsular Malaysia - Issues And Problems." An International Conference On Development And Management Of Tropical Living Aquatic Resources.

I8. Khoo Kay Huat, I978. "Implimentation Of Regulation For Domestic Fishermen." In Christy F.T. (ed). Proceedings Of The ICLARM/ISEAS Workshop On The Law Of The Sea. Manila, I978.

I9. Lam W.C. And Pathansali D. "An Analysis Of Penang Trawl Fisheries To Determine The Maximum Sustainable Yield." Fisheries Bulletin No. I6, Ministry of Agriculture, Malaysia.

20. Laws of Malaysia, Act 3I7. Fisheries Act I985. Part I, Sec. 2. P. 8 - I3.

2I. Mazlan Jusoh. "Management Of Marine Fisheries Resources." Paper presented in a Seminar in the University of Agriculture Malaysia, I985.

22. Mohamad Ibrahim, "The Malaysian Fishing Gears And Methods." Major paper for M.M.A. Programs, I980.

23. Mohd. Azmi Ambak, et. al. "Assessment of the Demersal Stocks Off Kelantan, East Coast Of Peninsular Malaysia." Pertanika 4(2), I98I.

24. Mohd. Shaari Sam Abdul Latif, I974. "Demersal Fish Resources Surveys And Problems Of Fisheries Resources Management." Fisheries Bulletin No. I5, Ministry of Agriculture, Malaysia.

25. Mohd. Azmi Ambak and A.K. Mohamad Mohsin, 1982. "Assessment Of The Trawlable Demersal Stock Off The East Coast Of Peninsular Malaysia." MALAYS. Appl. BIOL. II(2).

26. Menasveta D., Shindo S. and Chullascrn S. 1974. "Pelagic Fishery Resources Of The South China Sea And Prospects For Their Development." SCS/DEV/73/6/ Rome. FAO, Rome. Italy.

27. Ministry of Agriculture. "New Agriculture Policy." Kuala Lumpur, Malaysia.

28. Pathansali D. 1976. "Assessment Of Potential Yields From The Coastal Marine Fisheries Resources Of Malaysia." Fisheries Bulletin No: 15, Ministry Of Agriculture, Malaysia.

29. Tadashi Yamamoto. "Fishery Regulation Adopted For Coastal And Offshore Fisheries In Japan." Paper presented at the Expert Consultation on The Regulation Of Fishing Effort, FAO, Rome, 1983.

30. United Nations Convention On The Law Of The Sea, 1982.