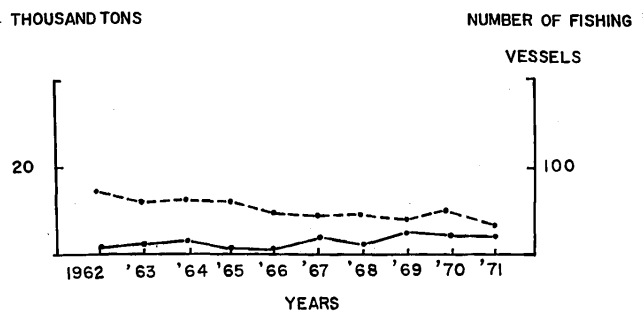
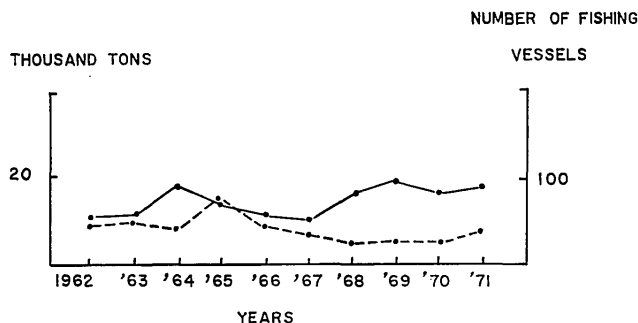


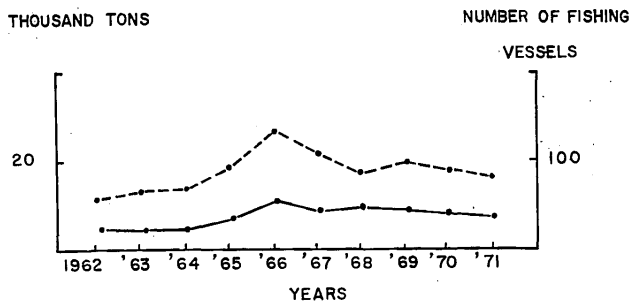
Fig. 7



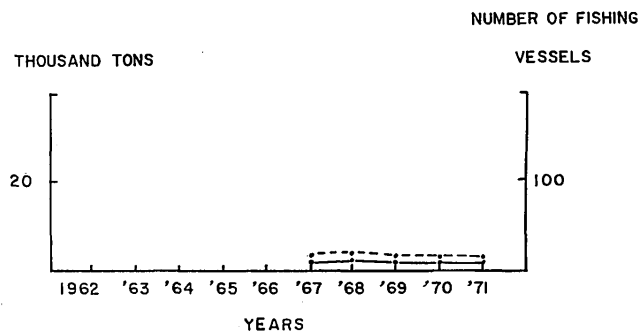
(A) BEACH SEINE



(C) MURO - AMI



(B) HOOK AND LINE



(D) TUNA LONGLINE

Fig. 8

Fig. 8

small purse seine net is being considered to save the operators of the former gear. For 1971, 61 units operated harvesting 2,446 tons.

3.5 Beach seine fishery, Hook and line fishery, Muro-Ami fishery and Tuna long line fishery

These fisheries have generally shown a constant production from 1962 to 1971 (see Fig. 8). These fisheries may be termed as "stagnant fisheries". The records from 1967 to 1971 do not show any growth in the production of tuna with only 200 tons in 1971 and 5 units operating. Most Philippine tuna is being harvested by hook and line fishery which is operated in coastal waters.

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Problems Other than Fisheries Resources in the South China Sea Area

by

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INTRODUCTION

Problems other than fisheries resources in the South China Sea Area can be broadly classified into two:

- (1) those relating to the nature of the fishing industry; and
- (2) those relating to fisheries institution to support

the fishing industry.

Attempt is made in the present paper to clarify the nature of these problems and to give some guide lines for solving these problems.

1. PROBLEMS RELATING TO THE FISHING INDUSTRY

1.1 Economic Structure of the Fisheries

In Asia, fishing establishments may be broadly classified into two categories; one the **fishing household** which engages in small scale fishing mainly with its own family members and the other the **fishing enterprise** which engages in large scale fishing mainly with enterprise employed fishing labourers exploiting demersal and pelagic resources in off-shore waters.

One of the important roles of a fishing census is to clarify such an economic structure of a fishery. Many Asian countries have participated in the 1970 Fishery Census which was recommended by the 11th Session of Indo - Pacific Fisheries Council (IPFC). However, as with the exception of Thailand the Fishery Census is still under progress no comparable data are available. Therefore, as shown in the attached Table the number of fishing households and fishing enterprises was estimated based on data currently available so as to give a very crude idea on the economic structure of the fishery in the area.

As seen in the attached Table there are some 660 thousand fishing establishments in the area, the majority of which are fishing households being 98.7% of the total. Only some 7,500 or 1.5% of the total are fishing enterprises, which operate in off-shore waters. In considering the development of fishery in the area this fact may well have to be kept in mind. At this moment, how far each of these two different categories of fishing establishments is contributing to the total national fisheries production is still not clearly known due to the lack of statistical data available. However, according to the results of annual sample survey on marine fisheries in Thailand fishing enterprises which are only some 3,000 in number produce nearly 80% of the total marine catch, whereas fishing households which account for 38,000 contribute only 20% to the total.

From the above illustration one can well imagine how a great discrepancy of fishery income has appeared between fishing households and fishing enterprises. In planning a fishery development programme either at national or inter-regional level a clear recognition on the economic structure of a fishery has to be made, since the nature of problems encountered greatly differs between fishing households and fishing enterprises. Usually the former suffers from the low productivity of fishery which will, in turn, result in poor livelihood of in-shore fishermen. Whereas, the latter has been bothered as to how to locate a better fishing ground to raise its fishing efficiency although it may have a problem of finding capital sources to expand the size of its fishing enterprise.

In developing a fishery in the area, equal attention should be paid to these different sub-sector of the fishery in the area. One must be aware that so far many government measures as well as bilateral or multi-lateral aid

projects have laid a great emphasis on the development of fishing enterprises ignoring the problem of fishing households.

1.2 Fishing Establishment

A fishing establishment is an economic body which has an intention of doing fishing business regardless of whether it is a fishing household or fishing enterprise. Many governments have established a programme of encouraging their fishing activities by introducing a new fishing gear, a newly designed fishing boat, a fishing credit system, etc. However, for implementing such a fishery development programme, many governments have met a severe difficulty due to the absence of fishermen's organization which is only the media to communicate between the government and fishermen. Without the help of fishermen's organizations the government has no way of doing anything. At present fishermen's organizations which are capable to do something for the benefit of fishermen are available only in parts of Malaysia and Indonesia.

1.3 Fishing Boat

A fishing boat is the most important and indispensable production means of fishermen. As a fishery in the area is fundamentally formulated on the basis of in-shore fisheries, the majority of fishing boats are either non-powered boats of indigeneous nature or small powered boats. This has naturally led to low productivity of in-shore fisheries, which in turn has resulted in a poor income of in-shore fishermen.

It has become a common rule that the mechanization of non-powered boat and/or the enlargement of the size of small-powered boat will play a greater role in improving the productivity of in-shore fisheries. However, in-shore fishermen are generally poor and hence cannot afford enough own money to do so. Therefore, a real problem in relation to a fishing boat lies in the procurement of capital for acquiring a boat engine or a larger boat rather than the pure technical improvement of a present fishing boat itself.

In considering the mechanization of a non-powered boat and the enlargement of a small powered boat there are two factors which have to be taken into account. One is whether fisheries resources which can be further exploited are available or not. The other is whether the mechanization of a non-powered boat or the enlargement of a small powered boat in size is economically beneficial or not. Such a study has hardly been done so far.

There might be some technical problems on the improvement of a large fishing boat in terms of e.g. cruising speed, fishing efficiency, etc. However, such technical problems could be mostly solved with the effort of the entrepreneurs themselves, since the business of off-shore fisheries cannot be in existence without having an efficient boat.

1.4 Fishing Gear and Fishing Technique

It is often said that fishing gears in use by in-shore fishermen are rather traditional and hence are in need of improvement. This argument may be, to some extent, true in certain areas. However, in many instances the traditional fishing gears have been developed for many centuries

so as to fit to the local condition of fishing grounds and the behaviors of fishes living in those areas. Therefore unless those gears are extremely primitive, there may not be much to improve.

1.5 Fishermen

In operating any fishing a fisherman is one of the elements together with fishing boat and fishing gears. It is also often said that in order to develop a fishery local fishermen have to be trained. It is true that a facility to train local fishermen is seldom available in the area. However, a question arises as to what type of training should be given to local fishermen. One must realize that the present training to fishermen under national or bilateral or multilateral project has laid so much emphasis on trawl and long line fishing technics.

1.6 Fisheries Infra-structure

Fisheries infra-structure, such as fishing harbour, fish marketing facility, ice-making factory, cold storage, boat and engine workshop, fish transportation facilities, etc. is the most important factor in the development of any fishery. Without these facilities no fisheries development could be realized. However, at present this matter has been greatly left behind in most countries of the area. As a result, a harbour that can be called a fishing harbour with various facilities as described above can be hardly seen in the area.

Any government in the area has formulated a plan of developing off-shore and deep-sea fisheries as a part of the national economic development programme. However, a plan of developing fisheries infrastructure is seldom seen in those plans. Fundamentally, the development of fisheries infra-structure should be considered in parallel with that of fisheries themselves. Hence, an important thing to note is that a fishing business is a concern of an individual who intends to do a fishing, whereas fisheries infra-structure facilities are a concern of all fishermen. Hence, the development of fisheries infra-structural facilities has to be done with the responsibility of the government.

of the government.

1.7 Fish Preservation and Processing

Fish is perishable and hence to keep its freshness until it reaches consumers has to be a great concern of fishermen, middlemen and consumers. This matter is particularly important from the viewpoint of fish producer, since a good price cannot be realized unless the freshness of fish is well maintained. So far the governments in the area have hardly involved in this problem.

The traditional methods of fish processing in the area are mainly sun-drying, salting and fermenting. It seems that there are not much to do in this area although the method of fish processing is primitive, since local consumers have been accustomed to take them and cannot afford purchasing more sophisticated fish commodities which are generally costly. On the other hand, recently the freezing of high quality fish like shrimp, cuttlefish, Spanish mackerel, etc. have become popular for export purpose. However, due to the absence of quality control by the government the producers have often suffered from a claim from importers. Therefore, the establishment of the government financed quality inspection system is

likely to be urgent.

As mentioned earlier, the production of trash fish in huge quantity seems to be fatal to the fishery in the area. Therefore, if a trawl fishery has to be further developed in the area, a study on how to make best use of this trash fish may have to be considered from the viewpoint of raising its economic value. There must be a fishery product made of trash fish other than fish manure, and fish meal, by which the present price of trash fish can be raised.

2. PROBLEMS RELATING TO FISHERIES INSTITUTION TO SUPPORT FISHING INDUSTRY

2.1 General

Fisheries institutions are defined as all types of institutions which will directly or indirectly render various services to fishermen or the fishing industry, and hence it covers not only national office of fisheries such as Dept. of Fisheries, Fisheries Commission, Fishery Agency etc. but also fishermen's cooperative society and its federation, various fisheries credit system, fisheries educational institutions, etc.

Fisheries institutions which are currently in existence in the area are, in many instances, those which were established during a colonial time. In spite of the fact that the pattern of a fishing industry in the area has been greatly changed in the past two or three decades, a very little improvement has been made on these institutions. As a result, the present status of fisheries institutions in the area is, in many cases, inadequate and weak.

Countries in the area have received a variety of technical assistance through either bilateral or multilateral aids. However, many of them are basically those in the field of natural science, such as fishing techniques, fish culture, fishery biology, fish processing, etc. In the field of fisheries institution the only exception may be two FAO Training Centers on "Fish marketing" and "Fishery cooperative society" which were held in Hongkong in 1954 and Sydney in 1957 respectively.

2.2 Fisheries Legislation

Fishery legislation is a general name of fishery law, fishery act, fishery registration, etc. In most countries the fisheries legislation which was promulgated during a colonial time is still in force without any substantial change in spite of a great change appeared in its fishery. Generally, such a fishery legislation will define the overall structure of fisheries institutions in a country and hence this matter is specifically dealt with at first.

Pertinent defects which are commonly found are summarized as follows:

1. The fishery legislation has been worked out mainly to secure the source of a budget for maintaining a national office of fisheries such as Dept. of Fisheries, Fisheries Div., Fisheries Commission, etc., although the legislation gives, to some extent, some regulations with regard to the conservation of fisheries resources. As a result, various taxes, such as fishing gear registration fee, fishing boat registration fee, fishermen's fee, fish caught fee, etc. are being imposed on the fishing industry.
2. Since the fishery legislation was worked out either

when inland fishery was predominant rather than marine fishery or when only in-shore fisheries were in existence, provisions with regard to the management of off-shore fisheries and those to eliminate the conflict between in-shore and off-shore fisheries and hence to protect in-shore fisheries are lacking or inadequate.

An important thing to note is that the present fishery legislation has often become a severe burden to make a balanced development of a fishing industry. Further more, in certain cases, the present fisheries legislation cannot cope with the management of international fisheries resources which has become necessary to some extent in the area, since off-shore fisheries are very loosely treated in it.

The foregoing reveals that now is the most appropriate time to review thoroughly the current status of fisheries legislations and to revise them so as to cope with the present need.

2.3 National Office of Fisheries (Dept. of Fisheries, Directorate of Fisheries, Fisheries Commission, etc.)

Every government in the area has a national office of fisheries which is normally under the Ministry of Agriculture. The real role of a national office of fisheries is to render various services to the fishing industry, by which a well balanced development of a fishery is achieved. However, the current function of a national fisheries office is, in many instances, heavily biased to either law enforcement or fishery biological research. As a result, the national fisheries offices are often considered as an enemy by fishermen, and hence there are a very few linkages between the national office of fisheries and the fishing industry.

Some pertinent points with respect to the current status of a national office of fisheries are given below:

A. Fisheries Development Planning and Fishery Statistics

Every government has a fishery development programme which has been worked out as a component of its national socio-economic development programme. Basically, such a fishery development programme may have to be prepared with an initiative of fisheries resources. However, owing to non-existence of fishery economist and absence or inadequacy of fishery statistics such a fisheries development programme has been poorly prepared, and hence it gives, in many instances, only several targets without specifying any measures to achieve them.

The development of national fishery statistical system has been largely burdened by

1. the present fisheries legislation which is of more law enforcement nature and
2. lack or inadequacy of fishermen's organization, the detail of which will be given below to some extent.

B. Fisheries License System

Based on the present fisheries legislation various fisheries licenses are issued to fishermen under the name of fishing gear registrations, fishing boat registration, etc. It is quite important to note that the major objective of issuing these fisheries licenses is to grasp the number and nature of objectives of fisheries administration, for which the national office of fisheries will try to render its

services.

However, the situation is entirely reverse, and during the course of issuing these licenses the focus is given to the collection of tax from fishermen. Naturally due to an evasive attitude of fishermen for tax payment this fact has resulted in the incompleteness of the record of fisheries license issued, which has, in turn, caused a difficulty of using these license records as a frame for the designing of various fishery statistical surveys.

As the present fisheries legislation has been visualized mainly aiming at collecting taxes from fishermen, this has affected the overall work of a national office of fisheries. In a certain country this work has occupied a tremendous part of the total work of the national office of fisheries inhibiting the expansion of other useful services to be rendered to a fishery.

C. Public Investment for Fisheries Infra-Structure

Mention has already been made somewhere in Section 1. that the provision of fisheries infra-structural facilities is the pre-requisite for the development of any fishery. A fisherman acquires a fishing boat and a fishing gear at his own responsibility. However, owing to the public nature of the fisheries infra-structure it is considered that only the government is the appropriate organization to take an active role on this matter.

It must be aware that the improvement of fishery infra-structure is something like that of irrigation system in agriculture. It is a wellknown fact that without the improvement of irrigation system agricultural production cannot be increased. Similarly, without the improvement of fisheries infra-structure a fishery as a whole cannot be properly developed. This is particularly true for the development of off-shore fisheries.

So far the national offices of fisheries in the area have hardly involved in this matter mainly due to the lack of financial support. However, it has become a common practice in many countries that in drafting an annual budget as a whole a good amount of budget for public investment is set aside at first to relax the unemployment problem of a country as a whole. Therefore there is a good possibility of sharing a part of such a budget for the development of fisheries infra-structural facilities. Furthermore, the construction of fishing harbour, fish market facilities, cold storage, etc. is considered to be the most appropriate project for a loan application to ADB or IBRD.

D. Fisheries Research

Fisheries research has to be done from the viewpoint of both biological and economic aspects. However, in most countries of the area the fishery research is extremely biased to fishery biology ignoring the study of fishery economy. It is, therefore, often found that the study of fisheries biology is done for the good of fisheries biology without reference to its implication with the fishing industry. Hence, there seems to be a keen need to make a through and careful review on the nature of all ongoing fisheries researches from the viewpoint of their usefulness to the fishing industries.

In viewing the current status of fisheries research

activities as a whole there is also a need to examine whether or not the present scale of fisheries research activities is well balanced to the other works of a national office of fisheries. In certain countries the fishery research is extremely ill treated perhaps because of the shortage of the budget, whereas in other countries the national office of fisheries has become as if it is a Department of Fisheries Research.

2.4 Fishermen's organization and Fishery Credit System

Fishermen's organization which is ideally to be organized in the form of fisheries cooperative society has been least developed in the area. Fundamentally, such a fishermen's organization is formulated for the benefit of fishermen by selling the catch caught by the members, by purchasing fishing materials for the members at cheaper price, by granting a credit to the members at a reasonable rate of interest, etc. However, such a fishermen's organization is also used as the most appropriate channel to render the government's services to fishermen. At present, the majority of fishermen are not organized into any type of fishermen's organization, and hence the government has no way of rendering its services to fishermen.

In many countries the matter of fishermen's organization has been dealt with by offices other than the office of fisheries. As such offices usually deal with not only fishermen's organization but also other organizations and furthermore a fishery is always considered less important comparing with other industries, the matter of fishermen's organization has been often overlooked.

Owing to a great difference in the nature of problems encountered it may be ideal to have a fishermen's organization for in-shore fisheries and off-shore fisheries separately. It may be also desirable that each of them have the responsibility for conserving fisheries resources.

2.5 Fishery Credit and Fishing Boat Insurance

For the development of a fishing industry a fishery credit system plays a key role, since fishermen usually do not keep enough saving for the acquirement of engine or larger boat. However, such a fishery credit system has also been poorly developed in the area. As a result, fishermen often make a loan with fish merchants. This practice naturally causes two disadvantages to fishermen; one is that the rate of interest for such a loan is usually very high, and the other that the price of fish is determined in favour of fish merchant who made a loan to fishermen.

In making a loan to fishermen the greatest burden is that fishermen usually do not have enough mortgage which causes a great risk to the creditor. The only way to solve this problem is to establish a fishing boat insurance scheme with the help of the government. In providing such a fishing boat insurance scheme the government usually provides a fund by which part of the premium to be paid by fishermen is subsidized. At present, such a fishing boat insurance scheme does not exist in any country of the area.

In considering fishery credit and fishing boat insurance scheme an advantage should be taken from IBRD, which recently started to give a loan to small farmers.

2.6 Fisheries Education

2.6.1 Fishery education for the fishing industry.

Undoubtedly, in countries of the area fisheries educational institutions at various levels are by and large lacking. However, so far no in-depth study has been made with regard to what kind of fisheries educational institution is required in view of the development of a fishery in the area. It may be logical that the type of fisheries educational institutions to be developed is determined taking into account a particular sub-sector of fishery in the area which definitely has a good potential for development. For example, coastal aquaculture seems to be one of the prospective subsectors in the fishery of the area. If so, a fishery educational institution for such a course would best serve to the development of coastal aquaculture.

2.6.2 Fishery education for the fisheries institution

The matter of fisheries education may have to be considered not only from the viewpoint of training fishermen who really involve in a fishery but also from the standpoint of strengthening the ability and competence of personnel who work in a national office of fisheries, a federation of fisheries cooperative society or an unit fisheries cooperative society, etc. Needless to say, they are key personnel who guide the development of fisheries as a whole. At present, the latter type of fisheries educational institution is virtually lacking in the area. As a result, in recruiting a government official to a national office of fisheries an applicant is, in most instances, sought among graduates who majored merely in zoology, biology or fishery biology. This fact has often misled the general direction of a national office of fisheries, since those officials who majored in zoology or biology are usually reluctant to change their subject even after they become government officials.

Attached Table

Number of Fishing Establishments in the Area (Estimate)¹⁾

	Total	No. of Fishing Households Engaged in In-shore Fisheries	No. of Fishing Enterprises Engaged in in Off-shore Fisheries
Total	660,400	652,900	7,500
(%)	(100.0)	(98.7)	(1.3)
Philippines	233,000	231,000	2,000
S. Vietnam	50,100	50,000	100
Republic Khmer	4,000	4,000	—
Thailand	41,000	38,000	3,000
W. Malaysia	25,000	23,000	2,000
E. Malaysia	5,000	4,800	200
Brunei	200	200	—
Singapore	2,000	1,900	100
Indonesia	300,100	300,000	100

- 1) All figures given in the table are estimates based on data currently available with the exception of those for Thailand
- 2) No. of fishing labourers households whose family members are simply employed by others as fishing labourers is not included.